Curriculum Development

- **Using Graduate Engineers (Alumni) to Mentor Undergraduate Students** — This case study discusses the results from a graduate mentoring initiative (2010–2018 sessions) involving third year (n=621) civil & environmental engineering (CEE) student mentees, graduate mentors (n=139) and employers (n=34). In self-selected groups (n=3-5) the student mentees visited a graduate engineer (a mentor) either in a design office or in a construction project setting. The requirement was for the mentors to provide their mentee group with a minimum of two visits per semester with each visit being at least 2 hours in duration. The mentors and mentees were also encouraged to develop informal communications between the visits.

  The mentee role is akin to that of a non-participant observer, whereby the mentor dispenses knowledge, guidance and advice and the mentees listen, observe, reflect, question and respond. These activities could be considered a partial fulfilment of the experiential learning (Kolb, 1984) theory designed to help individuals identify the way they learn from experience.

- **Studying Parliaments: Research, Teaching & Knowledge Exchange** —

  The School, after winning the UK Parliament’s Outreach Competition, designed a class that is taught by both academics and practitioners (parliamentarians, clerks and parliamentary outreach employees).

- **Early Years Pedagogue Masters** —

  The Early Years Pedagogue (EYP) Masters is an On-line Course that provides a learning platform for Early Years professionals across Scotland. On-Campus provision includes two initial induction days and a mid course review. This course used ‘My Place’ to house a range of pedagogical experiences that linked specifically to desired learning and outcomes for our students. Tools such as Synchronous and Asynchronous Chats provide opportunities for tutor-led sessions that explore and discuss key themes from learning and student-led discussions and create a space for students to research and build theories as part of a learning community. Module pages include introduction sections and weekly session content and materials such as: on-line lectures; individual and group forum tasks; on-line module reading; sub group & tutor group chat facilities; group and individual blogs, assessment forums & podcasts.

- **Video Tutorial: Working with Psychometric Data in SPSS** —

  To facilitate the teaching of handling psychometric data within a statistical software package (SPSS), a video tutorial was prepared using screen capture software and made available to level 3 Psychology students on MyPlace. The video tutorial features both visual and audio content and demonstrates how to complete a number of operations within SPSS, specifically: (i) entering research participant responses from a psychometric scale; (ii) reversing scores; (iii) computing total scores and descriptive statistics for a psychometric scale; and (iv) testing the internal consistency of a scale using a statistic called Cronbach’s alpha.

- **Raising awareness for the teaching-research nexus – integrating a small scale student-led research project into UG teaching** —

- **The Use of Social Media in Mathematics and Statistics** — We obtained a small grant to employ a couple of students to set up and monitor a Facebook page for new students starting maths based degrees within our department.
The Department looked at two new tutorial models which can be thought of as a form of social learning.

Management Development Program (Level 3) — We piloted a scheme where students are challenged to undertake placements in various socially-minded projects. The students were placed based on their expertise and on the needs of grassroots-level organisations. Last year we placed students in 13 different projects in the greater Glasgow geographical area, in the following academic season we will have students placed in 29 different projects.

'Speed dating' – As An Innovative Learning Method — One of the Honours Classes for the Human Resource Management degree is HR402 ‘Perspectives on Work and Employment’. Professor Taylor took over co-ordination of the class for academic year 2014-5. As the class content and modes of assessment had not changed for several years, it was decided to undertake a thorough revision. While maintaining the theoretical emphasis that had characterised the module and was an undoubted strength, innovation involved a lecture programme more focused on the application of theory to the empirical domain. For example, in the first section of the course on the theme of ‘The Global and the Local’, lectures on globalisation and the varieties of capitalism were accompanied by case study examples of Transnational Corporations (TNCs)’ activities and HR and employment relations policies and practices in a number of different countries.

Another example of this inter-relationship of theory and practice forms the subject of this particular ‘Sharing Effective Practice’ case study. In the last section of the class on ‘Trade Unions and Employee Representation’, change consisted first of a reconfiguration of the lecture programme, and second of innovation in respect of the related assignment. A formal lecture on ‘Trade Unions and Representation’ was followed by a session entitled ‘What Do Trade Union Reps Actually Do?’. At this session, six trade union officers and reps were invited to attend. The idea was that each of the reps/officers sit at a desk and students in turn, for a set time, sit opposite the rep and ask questions of them. Students then visit another table and so on. On the basis of the notes taken, students were obliged to complete a report which answered that general question. This report constituted the final assessed assignment of the class.

Social Learning in Tutorial — The Department looked at two new tutorial models which can be thought of as a form of social learning.

Using Flipped Classes to Enhance Face to Face Discussion in Engineering Labs — This case study describes the introduction of an online lesson in experimental engineering laboratory classes to facilitate the face-to-face discussion prior to the experimental activity.

Using Online Forums: A Tool to Enhance Experimental Engineering Laboratories — This case study describes the introduction of online asynchronous forums in experimental engineering laboratory classes, to facilitate discussion and comparison of results from different experiments.

‘Reading for a Degree’: A Compulsory Book Reading Coursework and Associated Book Club —

A compulsory book reading coursework for all 1st year civil engineers. Each year, the freshers are required to read one book from four that have been selected by the tutor (see the attached document for the 24 books used since the 2009-10 session).

The books selected for reading are chosen on the basis that they provide knowledge about the history and heritage of civil engineering including biographical text and / or contemporary accounts of inspirational civil engineering projects.

A department book club was established to run in parallel with the coursework and throughout the academic session so as to encourage students to discuss their book reading with peers, and to provide a platform to invite book authors to the department.

Book Club meetings to date have been:

- December 2014-Dr Ian Stewart, Alumni, and co-author of How to Read Bridges: A Crash Course Spanning the Centuries, visited the department on the 18th December 2014. Ian is a Chartered Engineer and an Associate at Blyth & Blyth. He has a BEng (Hons) Civil Engineering (2000) and a PhD in Structural Dynamics (2003).
- March 2011-Dr Ann Glen Reading from her book Airdrie-Bathgate Rail Link: Reconnecting Communities & Hugh Wark (Senior Project Engineer, Network Rail)

• December 2009-Emeritus Professor Roland Paxton (Heriot Watt) & Vice Chairman ICE Panel of Historical Engineering Works (PHEW) attends Book Club meeting. Author of several books on civil engineering.

• Using a Weekly Trade Magazine (New Civil Engineer) for Learning & Assessment —

This case study presents evidence from an initiative employing a weekly industry magazine - *New Civil Engineer* (NCE) - as a vehicle for introducing construction technology to first year students (N=153).

Using one or more hard copy editions of the magazine (from inaugural edition in 1972 onward) available in the university library, and following guidance regarding the definition of construction technology, the students were required to select six technological themes from any section (news, projects, adverts, etc.) of the NCE magazine.

Students were required to produce six drawings/sketches on either A3 or A4 paper and annotate each sketch and provide further notes indicating evidence of further research (i.e. consultation with text books/scholarly journals/ manufacturer’s websites etc.)

• Pharmacology Essay Enhancement Tool —

A 1-hour essay exercise on a previously announced topic written under exam conditions. Individual written feedback was given on each paper, but not a formal mark which would contribute to their final grade. In a follow up tutorial, strengths and weaknesses of essay writing and exam preparation were explored, with time for individuals to discuss their personal performance afterwards. Having explained these points, an essay enhancement tool was provided which enables students to critically self-evaluate their own attempts at essay writing and thereby improve their performance. The tool enables them to do this independently, or with peers in small study groups if that is their preference. This innovation has been tried in both final year and second year students.

• Postgraduate Programme in Genealogical, Palaeographic and Heraldic Studies —

We have been running a postgraduate programme through distance learning for the last 9 years. We have 3 quite distinct levels (PG Cert, Diploma and MSc by dissertation) which build upon one another and interest different markets.
In structuring new modules, I always build in collaborative tasks which have to be undertaken between sessions which either build upon or lead into class activities. This is a very simple way of providing a structure to support student learning which encourages greater engagement with ideas and reinforcement of learning, based upon social constructivist principles of learning. It encourages students to think more deeply, and in a structured way, about their learning, acting as critical friends for each other. For many students, it gives them a sense of security and confidence in their learning.

The programme of study is created utilising the ‘Teaching for understanding Framework’ based upon the work of Professor David Perkins and his colleagues at Harvard University. The module handbook sets out clearly for each session goals for student understanding, pre- and post-session reading and post-session tasks. These tasks can be cumulative, such as building a data-base of new vocabulary.

The tasks are recorded in a Reflective Journal which is assessed as part of the course. Students allocate themselves either to small groups to undertake these tasks or work with a critical friend (depending upon the size of the class) and they are expected to report back to the class. Students communicate with each other via e-mail or Google docs. The Reflective Journal can take a variety of forms including blogs and video diaries (and some students have communicated internationally about their learning via these means). Many of the Reflective Journals produced by students have been inspiring and demonstrate a deep engagement with learning. They have been identified consistently by the External Examiner as being an exemplification of best practice.

Students are also expected to construct a Log Book in which they record articles (academic, national press …) which encourages them to keep abreast in their professional field and they are expected to annotate these articles and reflect upon them within their journals. In some classes, I ask students to work with a critical friend to critique an article from a professional journal (eg. Times Educational Supplement Scotland) which they then share with another pair in the class before I select a sample for discussion within the class.

Written guidance is offered to students on the creation of their Reflective Journals and Log Books and a presentation is made on the Induction day with illustrations of previous students’ work (after permission has been sought of the students).

The fostering of critical reading and writing is infused throughout all of my teaching and I introduce students to the use of critical frames as a means of reading for meaning and for understanding (rather than gaining a surface understanding of what they are reading) and to foster criticality in their writing. I also demonstrate the use of critical frames in my teaching and utilise them to critique with the class the lecture, a text or another source.