Developing Writing in STEM Disciplines:
A South West HE STEM Project Conference
at the University of Bath
Monday 12th September 2011, 10.00 am – 4.15 pm

All open sessions in 4E 3.10

Keynote Presentation: Communicating in maths and science 10.20 – 11.00 am

How much maths is too much maths?

In this lively talk, Professor Chris Budd reveals some of the most effective ways of communicating maths to a non-specialist audience.

In the 21st century the written word is, of course, one aspect of many in our world of pervasive, multimedia, digitally-enhanced communication.

Professor Budd's talk sets the scene for the Conference's themes of meeting the challenges of effectively communicating mathematics and science in writing, and in doing so meeting both academic and employability imperatives.

Professor Chris Budd

A maths professor at the University of Bath and the Royal Institution of Great Britain, Professor Budd has a reputation for making maths and science accessible and fun. He was recently awarded a Fellowship of the British Science Association for his outstanding contributions to the public understanding of science through his work in organising '*Bath Taps into Science*', an annual science and maths fair for school children. In 2010, he directed the University of Bath's contribution to the Royal Society Summer Exhibition '*Living in a Complex World*'.

The fellowship also recognised Professor Budd's work with schools and other bodies to promote maths around the world, and his University work, including the highly successful '*Communicating Maths*' module for undergraduates, which has been running each year since 2002.

In addition to this recent fellowship, Professor Budd is also a National Teaching Fellow. Professor Budd has been at the University of Bath for 16 years researching problems at the interface of maths, engineering and industry.

Presentations on the theme: Engaging with students and staff 11.15 am – 12.15 pm

Developing students' writing in the disciplines

Mary Deane, Oxford Brookes University

This talk examines a method for embedding writing instruction into disciplinary contexts through staff development. It surveys '*Writing in the Disciplines*' (WiD) research, and aims to stimulate debate about opportunities for collaboration between writing specialists and subject experts. The three main themes of this talk are sustainability, employability, and student writing.

CPD portfolios for first year mathematicians

Barrie Cooper, University of Exeter

An induction survey of first-year mathematicians indicates that a key driver for doing a mathematics degree is the enhancement of employment prospects. To capitalise on this and to promote employability from the start of their degree, our first-year students prepare an assessed CPD portfolio in their first term. Creation of the portfolio is underpinned by a group investigation exploring '*What is a mathematician?*', examining the unique skills that mathematicians develop and communicating these to prospective students and graduate employers. I will describe the content and assessment of the portfolio and discuss further the supporting academic and pastoral context.

Following a developmental model of student engagement in the design of a 'Peer-tutor in Writing' training module: an appeal to the student experience

Lawrence Cleary, University of Limerick

Much has been done recently in the name of the student experience, but just what is meant by the term is unclear, as adherents working from a market model of student engagement define the term differently from those advocating a more developmental model (The Higher Education Academy 2010, p.3). This uncertainty over what is meant by the term threatens to reduce its significance. This presentation considers some elements key to a developmental model of student engagement and presents the Regional Writing Centre's '*Peer-tutoring in Writing*' module as an attempt to reclaim the term, putting a developmental model into practice.

Students as 'agents of change' in Biosciences – an essay-writing guide, written for students by students

Nicola King, University of Exeter

Students of Biosciences in Exeter chose to get involved in the innovative '*Students as Agents of Change*' project through a desire to have a real impact on teaching in Biosciences. Most L1 assessment in Biosciences is based on multiple-choice questions and a significant proportion of students felt that they were not well prepared for writing essays under exam conditions. The outcome of the project was an excellent booklet which 'demystified' the art of writing a scientific essay, provided academic insight into marking criteria and expectations, and provided useful tips on technicalities such as structure and referencing.

Student-led employability audit toolkit, a National HE STEM-funded project 12.15 – 1.15 pm

Laura Bonner, University of Exeter

This project has taken a structured approach towards analysing and assessing the extent of existing employability-related skills embedded within the mathematics and engineering degree programmes at the University of Exeter. In doing so, it has created a template for a student-led audit toolkit process whereby students identify and audit the employability skills embedded within their own degree programmes. In this way, students are better able to see how their skills integrate with their subject and become more aware of the value and relevance of such skills to both their academic studies as well as their future employment.

Presentations on the theme: What employers say they want 2.15 – 2.55 pm

Findings of a Science Communication Unit's survey of employers' views concerning the communication skills of graduate employees

Clare Wilkinson, University of the West of England

The presentation highlights findings from a nine-month project funded via the Higher Education Innovation Fund in 2010-11. Drawing on a questionnaire survey of employers, in addition to interviews with employers and University programme leaders, the presentation highlights both consensus and disagreement regarding graduate communication skills. There is continued demand from employers for graduates to demonstrate effective communication skills in scientific and technological subject areas, as well as many others, often encompassing use of new technologies. Concurrently, programme leaders are aware of the importance of such skills, but also face challenges in attending to some areas of skill development.

What engineering placement students and their employers think about students' writing development – what it is and who is responsible for it

Trevor Day, University of Bath

An HE STEM-funded survey of engineering placement students and their employers revealed similarities and differences in perception between the two groups. They broadly agreed on the relative importance of key writing capabilities and where responsibility lay for preparing students for the writing they do on placement. To some extent they disagreed in their perceptions' of the range of writing tasks expected of placement students and students' level of engagement with clients. Recommendations, taking into account such findings, are made for engaging with academic staff in integrating writing development in the curriculum to meet both academic and employability imperatives.

Presentations on the theme: Engaging with writing 3.15 – 4.15 pm

Supporting students' re-writing

Mary Deane, Oxford Brookes University

This talk focuses on a task that many students find daunting and difficult: revising assignments before submission. It explores key literature on revising strategies, and offers a structure for teaching students how to re-write their assignments drawing upon best practice from research into one-to-one writing tutorials. The three main themes of this talk are individualised writing instruction, referencing, and student engagement.

Critical Thinking – a framework for feedback on writing

John Hilsdon, University of Plymouth

This presentation offers a potential framework for giving feedback on students' writing. This framework was developed at Plymouth University as part of the *Writing for Assignments E-library Project (WrAssE)*, and is designed to enhance skills for critical thinking. The presentation will introduce the underlying logic of the framework and will invite participants to make use of it in order to test out the key assumptions on which it is based. These arise from an observed generic functional-narrative model of text structure. Participants' evaluations over time will be invited, and there may be possibilities for participation in future developments of the model.

Backdoor engineering and design recovery in writing tutorials for first-year engineers: the allure of belonging

Lawrence Cleary, University of Limerick

In ME4001, *Introduction to Engineering*, first-year students at the University of Limerick, Ireland, have yet to choose their specialisation. While Dr. Michael Walsh, the module coordinator, initiates new students to unit conversions, Lawrence Cleary from the Regional Writing Centre works with students on report writing. Lawrence's strategy combines prescriptive approaches to writing engineering reports in four hours of lecture time (accommodating the way that engineering students say they like to learn) with tutorials that focus on examining texts and trying to understand what they tell us about the way engineers communicate (an inductive approach).

Reflective writing for first year mathematicians

Barrie Cooper, University of Exeter

The transition from A-levels to studying within a research-led community of scholars can be a daunting and challenging prospect for new students. During their first term, new mathematics undergraduates at Exeter engage in a module, '*Mathematical Investigations*', designed to introduce research-like collaborative learning and promote better integration amongst the students. Throughout this process, we encourage the students to reflect on their transition experience and their position within the mathematics community. These reflections are drawn together in an assessed reflective essay at the end of the module. I will discuss different approaches I have used to promote such reflective writing.

Speakers:

Laura Bonner is a Project Coordinator for three HE STEM-funded projects on Employability, Outreach and Work-based Learning at the University of Exeter's College of Engineering, Mathematics and Physical Sciences. Laura has an academic background in Management Studies and before her current role conducted employability skills sessions for the University of Exeter.

Lawrence Cleary researches writing and writing pedagogy for the Regional Writing Centre at University of Limerick, Ireland. In this capacity, Lawrence works with students and staff to develop writing across the disciplines. His contribution to an introductory module in Engineering was instrumental in helping the B.Eng. programme achieve professional accreditation.

Dr Barrie Cooper is Assistant Director of Education for Mathematics and Computer Science at the University of Exeter. Barrie manages three HE STEM projects: developing an Outreach & WP Community of Practice; designing a student-led employability audit for STEM curricula; and developing work-based degree programmes in mathematics and engineering.

Dr Trevor Day heads the project on which this Conference is based. Trevor facilitates writing courses and workshops for undergraduates, postgraduates and staff at Bath and elsewhere. Originally a marine biologist, and then a science lecturer, writer and educational researcher, he combines a writing career with research and development.

Dr Mary Deane is an educational development consultant based at Oxford Brookes University. She has published widely on academic writing, including the books: *Writing in the Disciplines*; *Academic Research, Writing, and Referencing*; and *Critical Thinking and Analysis*. Mary's specialisms include staff development, theories of motivation, and writing for publication.

John Hilsdon is Head of Learning Development at Plymouth University and a National Teaching Fellow. He helped set up the UK network of learning developers in 2002, and was the first Chair of the *Association for Learning Development in Higher Education* (see www.aldinhe.ac.uk). He is co-editor of the *Journal of Learning Development in Higher Education* (www.aldinhe.ac.uk/ojs).

Dr Nicola King is Associate Director of Education and Senior Tutor in Biosciences at the University of Exeter. Her focus is on the student experience and getting students involved in many aspects of learning, from engaging students in 'change agent' projects, to developing new e-learning resources and widening student participation.

Dr Clare Wilkinson, Senior Lecturer in Science Communication, carries out research on communication, science and society, and public engagement. Clare has undertaken consultancy for the Department for Business Innovation and Skills, and The Department for Children, Schools and Families. Her research has been funded by the British Academy and ESRC.