

**SUMS project 'Maths Gap' workshop
Homerton College, 16-18 December 2008**

Keynote Speakers' Biographies & Abstracts

KEYNOTE 1: The story of Biomeasurement:

Dr. Dawn Hawkins
Senior Lecturer
Department of Life Sciences
Anglia Ruskin University

Biography

Dr Dawn Hawkins is a senior lecturer in the Department of Life Sciences at Anglia Ruskin University. She is the author of *Biomeasurement*, a textbook published by OUP designed to gently introduce statistical analyses to bioscience students, based on a first year undergraduate module on which she leads. In 2006 she initiated a project funded by the HEA Biosciences subject centre to produce NuMBerS (Numerical Methods for Bioscience Students), an on-line resource to support teaching and learning involving numeracy skills, and is currently on the core group supporting the SUMS project. Dawn also lectures in animal behaviour and conservation and conducts research in these areas through the Animal Behaviour Research Unit (ABRU) in Tanzania.

Abstract

Those involved in teaching and learning at HE/FE are increasingly constrained, in their ability to produce students capable of functioning fully as professionals in their subject areas, by a gap between the math skills the students have and the math skills the students need. This talk focuses on this general problem as manifested in statistical skills and biology students at Anglia Ruskin University. In the early 1990s failure rates on the introductory statistics course for biologists taught by maths specialists reached 30%. The module was not only just not closing the gap, it was widening it through damaging student motivation and confidence. Biology staff sought to address this by developing a module they called Biomeasurement which took a 'by biologists for biologists' approach which was less theoretical and more context specific. This talk describes this experience and how it has led to a textbook by OUP with an on-line resource centre and the HEA funded NuMBerS and SUMS projects. The problems solved and uncovered along the way are highlighted.

KEYNOTE 2: Every Student Counts: Promoting Numeracy and Enhancing Employability A Progress Report

Dr. Claire Worthington
Lancashire Business School
University of Central Lancashire

Biography

Dr Claire Worthington joined the project in August 2008. With a background in Operational Research she has taught a wide range of maths, stats and OR to a variety of undergraduate and postgraduate students from many differing backgrounds and countries. She relishes the opportunity this project offers to explore and establish numeracy support for our students and staff.

Abstract

This is a 3-year project which started in September 2007. It is funded by the HE Academy's NTFS Project Strand.

The higher education community, professional bodies, government and employers are all concerned about the numerical competency of undergraduates. However, not all academic disciplines enable undergraduates to practise and/or develop numeracy skills beyond their compulsory education. Yet all undergraduate students need to be numerically competent if they are to progress in their chosen discipline and enhance their graduate employment prospects.

The aims of this project are to investigate:

- learning, teaching and assessment opportunities for developing students' numerical skills within their undergraduate programmes
- student support requirements necessary to strengthen student progression and employability.
- generic numerical skills required by graduate employers, and how their development might be better supported across all disciplines.

Surveys are underway of employers and UCLan students and tutors. There is particular interest in Biosciences, Business and History, as these are the subject areas of the UCLan National Teaching Fellows who were originally involved in this project.

In addition to the in-depth analysis within UCLan, the History research is a joint project with two partner institutions (Manchester Metropolitan University and Sheffield Hallam University). It is investigating numeracy within undergraduate History curricula in their institutions and comparing them with those from other UK and overseas institutions to assess to what extent, and how effectively students' numeracy skills are being developed and practised.

KEYNOTE 3: Approaches to Supporting HE Students with Numeracy Needs

Dr. Peter Samuels
Senior Researcher Fellow
SIGMA Centre for Excellence in Mathematics and Statistics Support
Coventry University

Biography

Dr Peter Samuels is the Senior Research Fellow in the SIGMA Centre for Excellence in Mathematics and Statistics Support at Coventry University as well as Serious Games Applied Research Group Coordinator. His research interests include:

- Resource development for self-paced learning in discrete mathematics
- Appreciative Inquiry research into mathematics support leadership in UK HE
- Mathematics study skills resource development
- Serious games and mobile learning in HE mathematics
- Informal training of mathematics education PhD students
- Collaborations between mathematics support and academic writing

Abstract

This presentation will begin with a description of the definition, rationale, history and current provision of mathematics support services in UK HE. The recent developments in mathematics support provision through the award of Centre for Excellence status to the SIGMA project at Coventry and Loughborough Universities will then be described. In particular, strategies and resources for supporting the numeracy needs of students in UK HE will be described with particular reference to:

- University-wide mathematics support services
- Faculty-based numeracy support services
- Mathematics support outreach services
- Special needs mathematics support services
- Statistics advisory services
- A proactive teaching programme
- The development of study skills resources
- The use of new technologies in mathematics support services

Finally, a recent collaboration with an academic writing centre will be discussed which suggests a possible innovative approach to assisting the development of numeracy teaching within UK HE institutions.

KEYNOTE 4: Numeracy in Nursing

Ms. Kerri Wright
Senior Lecturer
Department of Acute and Continuing Care
University of Greenwich

Biography

Ms Kerri Wright is currently writing a chapter for a book on assessing patients for district nursing. Her main interests are Primary Care and in particular continuing care and district nursing and her research interests are in caring for the terminally ill from a district nurses perspective and assessing and decision making.

Abstract

Numeracy and drug calculation skills are seen as essential skills in nursing. Errors in drug calculations can result in incorrect drug dosages being administered which can lead to adverse and sometimes fatal consequences for the patient. Recent research and media reports along with the political agenda focussing on national literacy and numeracy have led to a renewed focus on this key skill in nursing.

This presentation will briefly discuss the history of drug calculation education and the potential difficulties in the present methods being used to teach and assess this skill. A mathematical problem solving framework will then be used to illustrate and discuss the different types of knowledge and skills required to successfully problem solve which go beyond mathematical knowledge.

The discussion will draw on work from cognitive psychology, everyday cognition, mathematical education, nursing and philosophy to expand and discuss the ideas presented. Examples from my own research and teaching in this area will also be used to illustrate points being raised for further discussion.

KEYNOTE 5: Assistive Technology to Access and Develop Maths:
Opportunities, Hurdles and Barriers

Dr. Abi James
Managing Consultant, Product Strategy
iansyst Ltd

Biography

Dr. Abi James is an assistive technology consultant and product management specialist with iansyst, a company that specialises in providing software and technology to help overcome the difficulties associated with dyslexia and other disabilities. Having worked closely with both developers and dyslexic users for many years, Abi has extensive knowledge of the solutions that are available to help dyslexic users and frequently contributes to conferences, courses, websites and publications on the subject. This has included presentations to the British Dyslexia Association International Conferences, the Dyscalculia and Dyslexia Interest Group and the review by Sir Jim Rose on the identification and teaching of children with dyslexia in 2008 on behalf of the BDA New Technologies Committee. Abi has collaborated on a number of research projects looking into the effectiveness of assistive technology including projects with the University of Manchester and TechDIS. Dyslexic herself, Abi has personal experience of using computers to overcome her difficulties and is an advocate for using technology to empower dyslexic children and adults to make the most of their abilities.

Abstract

Online learning materials and computer-based support activities can provide many benefits for those students with specific learning difficulties such as dyslexia and dyscalculia. Assistive technology can also remove many of the barriers to learning for these students. However, mathematical notation, language and diagrams currently pose significant hurdles to these technologies. Therefore, to make the most of online learning materials, accessibility for students with specific learning difficulties should be considered at the early planning and design stages.

This session aims to:

- Give a brief introduction to specific learning difficulties and why online learning can benefit these students.
- Demonstrate some of the assistive technologies currently used by students in higher education.
- Discuss how learning materials on maths topics can be made accessible for use with assistive technologies.

The SUMS project (Students Upgrading Mathematics Skills) is funded by the Higher Education Academy e-learning observatory programme and the Faculty of Science and Technology of Anglia Ruskin University. See <http://www.anglia.ac.uk/sums>