

## Towards a Scholarship of Engagement

THE scholarship of engagement is generating increasing interest across the HE sector. New challenges and opportunities are being addressed as academics work with peers, and sometimes also with user communities, to envisage, theorise and instantiate new places, spaces and methods for public engagement. In so doing, scholars are working to identify, and to assess more effective ways of generating, representing, circulating and debating knowledge in the public sphere.

This shifting agenda is illustrated by the forthcoming Research Excellence Framework (REF): to meet changing requirements of the Research Councils the REF will include an assessment of the impact of research. Evidence of successful public engagement can count as impact. It should come as no surprise then that academics are working up case studies to demonstrate evidence of reach and significance in relation to public engagement with their research.

The advent of a scholarship of engagement, and of an emergent community of practice, is apparent in the UK and internationally. However, uptake is far from comprehensive; enthusiasm for engagement remains uneven across the HE sector and within and across academic fields. And significant challenges remain, not least in terms of defining success and failure in relation to public engagement activities, and to what extent the public values different engagement practices.

eSTEEeM is contributing to this agenda in a number of ways; through a recent call for proposals, details

of which are available on the website, and a colloquium exploring the scholarship of engagement.

eSTEEeM has teamed up with colleagues in the Centre for Research in Education and Educational Technology (CREET) to organise a cross-disciplinary colloquium to explore the scholarship of engagement. Planned for the 6th December 2011 the colloquium will focus on three related themes: reassessing public knowledge; revisiting digital media; and rethinking public participation.

This event brings together distinguished public engagement experts to explore engagement research and practices that are (re)conceptualising contemporary and next generation practices and technologies.

Among the international contributors, Joan Leach will explore how academic knowledge circulates in the digitally-mediated public sphere. She will discuss research that contributes to an understanding of how ideas about social epistemology relate to contemporary conceptualisations of public engagement.



Dr Joan Leach, Senior Lecturer in Rhetoric and Science Communication, University of Queensland, Australia.

*Continued overleaf*

## Inside...

### Pages

2 - 5 **STEM update**

From the Director of the HE STEM Programme and Head of STEM at the HEA

6- 10 **eSTEEeM Projects and Themes**

11-16 **Researching Learning in Immersive Virtual Environments (ReLIVE11)**

Reports from the second international conference

17 - 20 **eSTEEeM News and events**



Paul Manners, Director of the National Co-ordinating Centre for Public Engagement.

In contributing a UK sector-wide perspective, Paul Manners will examine how public engagement is currently framed within the guidance for the Research Excellence Framework (REF). He will explore how public engagement is described, how its role in generating impact is explained, and what the expectations are about how this impact can be evidenced.

Select <http://www8.open.ac.uk/creet/main/events/2011-12> for further details about the colloquium and the various speakers. Places for this event are limited. Please complete the form on the CREET site if you are interested in attending.

**Written by Richard Holliman, Faculty of Science and CREET, The Open University.**

**R.M.Holliman@open.ac.uk**

## Mathematics at the Transition to University: A Multi-Stage Problem?

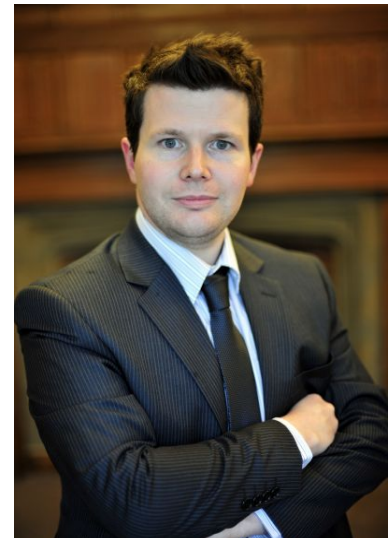
AS Director of the National HE STEM Programme I am immensely proud of all areas of its work, but one that I continue to take particular personal and professional interest in is the teaching and learning of mathematics at the transition to university. This naturally reflects my background within the Higher Education Academy Maths, Stats & OR Network, but more so the fact that I also teach both Foundation and First Year mathematics university courses.

Mathematics and statistics form an important component of many degree programmes. There exists, however, a well-documented problem with the mathematical preparedness and skills of undergraduate students as they commence their university studies, and not just within the Science, Technology, Engineering and Mathematics (STEM) disciplines. The evidence for this problem goes back over 15 years, yet recent reports continue to provide robust evidence of ongoing concerns. But is this problem the same as that documented 15 years ago?

The report, *'Measuring the Mathematics Problem'* (2000), recognised the existence of a mathematics problem within the disciplines of mathematics, engineering and physics, and highlighted two contributing factors in particular: *'insufficient candidates with satisfactory A-level Mathematics grades for the number of degree places available'* and *'the freedom of A-level students to choose Statistics as an alternative to Mechanics'*.

Since 2000 we have seen a substantial increase in

the number of students studying mathematics at A-level. For 2011 completers, mathematics is now second in the top ten list of most popular A-levels, although there is a need to remain cautious as there is evidence that students at private schools are twice more likely than their peers in comprehensive schools to study mathematics at this level. While there has been growth in mathematics A-levels, there has also been growth within the HE sector. In recent times growth within the STEM disciplines has, on the whole, greatly exceeded the sector average. Studying the average tariff data for 2009/10 and 2011/12, presented in the Guardian university rankings, and which indicates the average number of UCAS points students possess on entry to only mathematical sciences degree programmes, reveals some interesting patterns. Averaging these across all institutions who provided data shows that the average UCAS tariff for the mathematical sciences increased by 10 points to 386 points in 2011/2012. While not con-



Michael Grove.

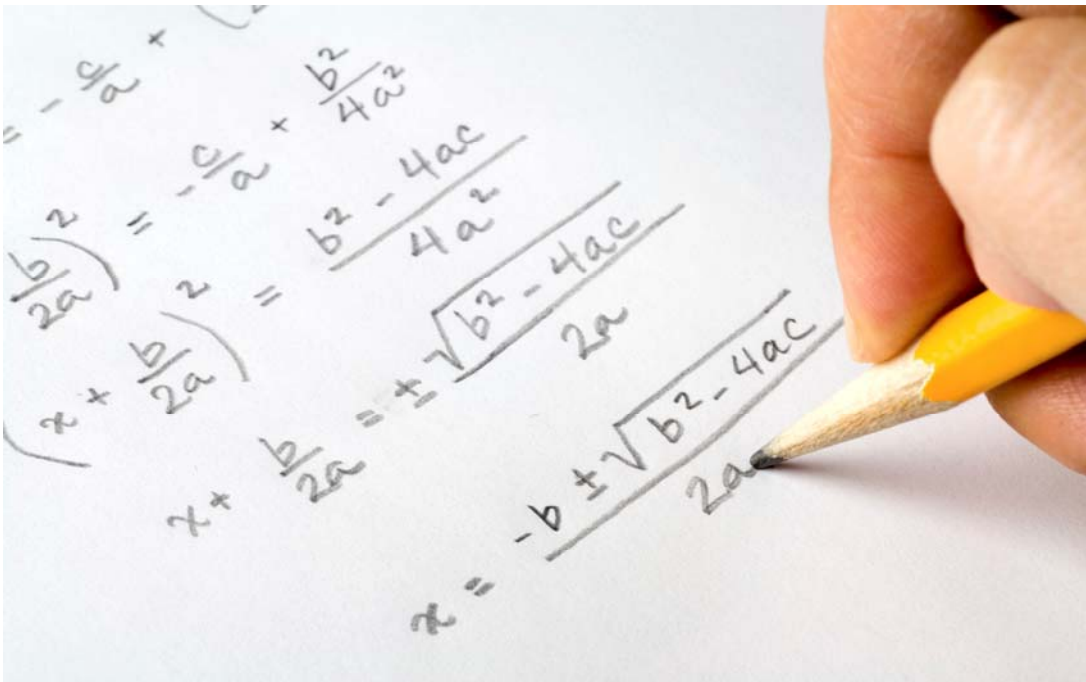
clusive, it reflects a general trend of an increase in the qualifications of incoming students being accepted for university entry to study mathematics, although it is certainly not a universal pattern for all the HEIs for which data was available.

There has been growth in both A-levels and university courses within mathematics and disciplines that contain a significant mathematical component, and it is evident that there are now more learners who have higher pre-entry qualifications in mathematics than previously. Despite this, the mathematics problem continues to exist, suggesting it is no longer due to an insufficient number of A-level candidates with the necessary grades. The Institute of Physics, one of the Partners of the National HE STEM Programme, recently produced a report entitled *'Mind the Gap: Mathematics and the Transition from A-levels to Physics and Engineering Degrees'* which indicates many physics and engineering academic members of staff feel new undergraduates within their disciplines are underprepared as they commence their university studies due to a lack of fluency in mathematics. In addition, the report also highlights the concerns that students themselves are now beginning to articulate in relation to their mathematical skills prior to university entry. This is despite the evidence that they are typically arriving at university with increased mathematical grades, and provides further evidence of issues with pre-university qualifications rather than the individual students themselves.

The *'Measuring the Mathematics Problem'* report recommended that *"Prompt and effective support should be available to students whose mathematical background is found wanting"*, and while it is evident that

the mathematics problem has not been solved, significant progress has been made. An ample supply of free, good quality resources are available to help any students serious about remedying their shortcomings, and to help academic and support staff who aspire to assist students who struggle at the school-university interface, and a significant proportion of universities have invested substantially to put palliative mechanisms in place, for example mathematics support centres. It is also the case that there are, or have been, several high profile, well-resourced national projects designed to increase the supply of mathematically qualified school leavers, and to improve teaching quality and continuing professional development of mathematics teachers.

So where should we now focus our efforts to address this problem given the progress we have made to date? A key finding of the Institute of Physics report is that many of the academics surveyed believe that current mathematics and physics provision at A-level leads to students learning by rote rather than through their own independent techniques. A 2008 report entitled *Newton's Mechanics – Who Needs It?* highlighted similar concerns and linked this to a decline in the ability of undergraduate students to model and solve problems at the transition to university. Our efforts should now be to address the lack of fluency amongst incoming undergraduate cohorts in the application of mathematical techniques to unfamiliar exercises, problems or scenarios. The current A-level system does not allow students sufficient opportunity to apply their mathematical skills, particularly if they choose not to study mod-



Mathematical equations. Picture: iStock.



ules of mechanics. It is interesting to note that those students who responded to the Institute of Physics survey and had studied components of further mathematics prior to university entry felt better prepared mathematically for their studies and indicated they felt they required less support. Our interventions, particularly during the first year of university study, need to focus upon allowing students to model scenarios, solve problems, and generally have extended opportunities to engage with the application of mathematics to disciplinary contexts. These are in addition to ensuring ready access to the existing support measures we have developed remains available.

There is also now clear evidence that the number of disciplines impacted by the mathematics problem has broadened, from its initial impact upon the disciplines of mathematics, engineering and physics, with issues now being seen within chemistry, and the biological, health and social sciences. A different contributing factor is responsible which was highlighted in a recent report by the Advisory Committee on Mathematics Education (ACME) that found around 210,000 students out of the 330,000 that are studying courses that require mathematical knowledge beyond GCSE do not have the required skills, leading to challenges for both the universities and students involved. Here the issue is that students on a wider range of higher education courses are either not aware that the further study of mathematics would be highly beneficial to them or universities are not requesting they study it. As a consequence, students are arriving at universities without having studied the necessary mathematical courses, and for many, they may not have studied any mathematics for two or three years prior to university entry. This is something we can collectively influence and address through our university admissions processes.

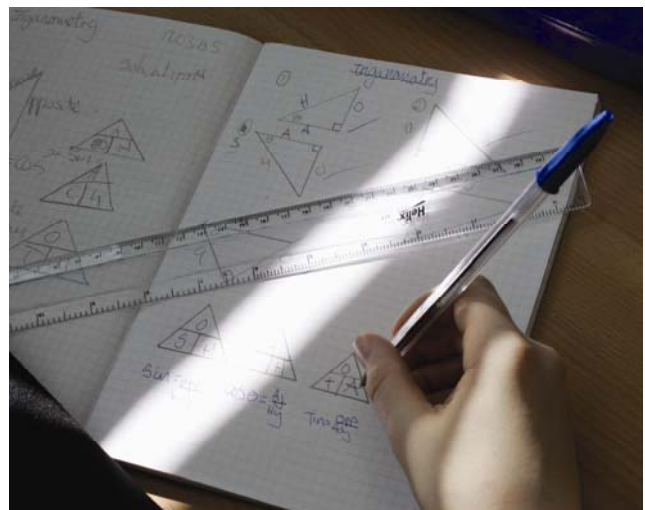
The fact that a mathematics problem continues to exist many years on may imply a gloomy picture, but the response of higher education to it does not. Measures have been put in place nationally to ensure that all students embarking upon undergraduate programmes with a strong mathematical content have access to resources that will ease their transition into higher education. Universities are adopting a number of approaches to tackling transitional problems, for example by the provision of summer schools, bridging mathematics courses and through mathematics support centres which many universities have now established. Universities now also have access to a range of quality resources that have been produced directly to support students: the FDTL4 project Mathematics Support at the Transition to University has developed mathtutor, the FDTL4 project Helping Engineers Learn Mathematics (HELM) produced workbooks, and the mathcentre project has produced numerous resources as well as an online resource bank. In addition, through the work of the National HE STEM Programme and the sigma centre of excel-

lence in mathematics and statistics support, a national mathematics support network has been established for higher education staff working to address the student mathematical transition to higher education. The Programme also has several other projects active in addressing the issues described. For example, at the University of Leeds a project focused upon enhancing students mathematical modelling and problem solving skills at the university transition now involves seven departments within four HEIs who have all made changes to the way their programmes of study are delivered to ensure these vital mathematical skills are effectively developed.

To address the mathematics problem prior to university entry clearly requires adjustment to the pre-university curriculum. Members of the Programme Team, and by this I include those from the HE sector who are participating in its activities, would be willing to contribute to the redesign of the existing GCSE and A-level curriculum and there is a very natural role for higher education here if government so chooses. Until then, we must continue to support students develop and enhance their mathematical skills upon university entry; I am delighted we are working with the sector to do just that.

**Written by Michael Grove, Director National HE STEM Programme, University of Birmingham.**

[m.j.grove@bham.ac.uk](mailto:m.j.grove@bham.ac.uk)



Geometry exercise book. Picture: Karen Parker.

## Update on HEA and Learning and Teaching in STEM Disciplines



Dr Janet De Wilde.

THE newly re-structured Higher Education Academy (HEA) has three main areas of work: Teacher Excellence; Institutional Strategy and Academic Practice Development.

Academic Practice Development has four clusters: STEM, Health Sciences, Social

Sciences and Arts & Humanities. We have a new team in STEM whose members have been employed from a range of Higher Education Institutions. The team are really looking forward to building on current practice in learning and teaching in STEM and also supporting the development of innovative practice. The team is based across the UK and will endeavour to engage across the sector. We will be linking to those with expertise in STEM learning and teaching practice, Professional Bodies and a wide range of organisations. Please look out for newsletters and communications from the STEM team at HEA.

The Head of the STEM team is Dr Janet De Wilde; she was the Executive Manager of SINAPSE (the Scottish Imaging Network), based at the University of Edinburgh and had previously worked at Heriot-Watt University, Imperial College for 18 years and for five years in industry with Marconi. The STEM cluster has 8 Discipline Leads: Dr Nathan Pike for Biological Sciences, Dr Helen Walkington for Geography Earth and Environmental Sciences, Dr Mary McAlinden for Mathematics Statistics and Operational Research, Dr Mark Ratcliffe for Computer Science, Dr Simon Steiner for Engineering, Jane Kettle and Aled Williams for Built Environment, Paul Yates for Physical Sciences, and Dr Julie Hulme for Psychology.

### General Academic Practice Development Activities

There is a range of funding opportunities for those in STEM and other areas from the HEA, these include:

- Workshops and Seminars - Through the discipline series, institutions are invited to host and deliver a workshop or seminar on teaching and learning in a discipline context.

- HEA Teaching Development Grants – £1.5 million will be available through 4 calls: the first (individual) took place just before the summer break; the second (departmental) is currently live; the third and fourth (collaborative and another individual) will take place later in the academic year.
- HEA UK Travel grants – small amounts of funding (£300 individual to £500 for teams) are available to enable academics to make attend conferences and other events for purposes related to improving their teaching.

Further details can be found at: [www.heacademy.ac.uk/funding](http://www.heacademy.ac.uk/funding)

Future calls will be based on:

- HEA PhD Studentships – funding will be made available for a number of PhD scholarships to address subject or interdisciplinary focussed pedagogical research related to improving the student learning experience. This will be launched later in the year.
- HEA International scholarships – this scheme is at the embryonic stage of development; it will provide funding to enable academic staff to undertake a significant piece of work drawing on best practice internationally and then to disseminate the outcomes in the UK. This will be launched later in the year.

### Contacts

For more information about the STEM cluster work of the Higher Education Academy please contact: Janet De Wilde or visit the website: [www.heacademy.ac.uk](http://www.heacademy.ac.uk)

**Written by Janet De Wilde, Head of STEM, Higher Education Academy, York.**

[Janet.dewilde@heacademy.ac.uk](mailto:Janet.dewilde@heacademy.ac.uk)



# A Global Movement for Online Experimental Work Gathers Pace

IN November of last year I wrote about the potential for collaboration with a university in Shanghai.

We and our colleagues in East China University of Science and Technology (ECUST) are presented with the opportunity to join a global movement in engineering education that gives new emphasis to 'practical' engineering skills such as design and experimentation ... and we are currently exploring how we might work [together] in the field of online practical work. ... In practice, there is a great deal we can each learn from the other.

With support from eSTEEeM, OU staff have now visited China and ECUST staff have visited the UK. So what have we been doing during these visits and what have we learnt?

Well, mostly it has been about getting to know each other better and trying to learn enough about how we each work to be able to put together a plan for the future.

We, the OU contingent, have established that ECUST has an impressive inventory of 'experiments' that students can conduct sitting at a computer. They categorise these into 'virtual experiments', 'simulations' and 'remote control laboratories'.

In all, ECUST students can undertake over 150 different experiments.

While the virtual experiments and simulations are similar in many ways to learning resources that we currently use with our students at the OU, the remote control laboratories are far beyond what we have yet attempted.

The remote control labs are dominated by aspects of chemical engineering. A number are experiments in remote monitoring and control, which arguably lends itself to remote access. But, more surprisingly, ECUST chemical engineering students can actually perform chemical processes at a distance, although not without the support of a person present in the laboratory at the same time. In addition, mechanical engineering students are getting access to a number of standard experiments in mechanical testing. During their visit to the UK, ECUST staff met OU



ECUST remote control laboratory. Picture: Mark Endean.

students at TXR120 residential school in Bath and took part in a short workshop at Walton Hall. Their observations about their experience reveal some of the differences between our respective approaches to experimental work in our teaching:

- an experiment reflects the integrated application of ... mathematics, physics, chemistry and computer
- emphasis on the interaction of students and teachers, teamwork [at residential school]
- for the distance learners, the interface streamlined and effective, emphasises the effectiveness of each module
- online experiments combined with the online curriculum courseware closely, not a separate activity, to facilitate student learning the current theories
- completion of the experimental process is open to students ... do not stress the students must follow a defined procedure





OU lab equipment. Picture: Mark Endean.

So, while we have been impressed by ECUST's commitment and progress in virtualising, in the broadest sense, the experimental programme for their engineering students, they have been impressed by our approach to educating distance learners.

We now have to decide how to build a collaboration around making the most of our respective strengths to enhance the experience of students in both institutions.

**Written by Mark Endean, Faculty of Mathematics, Computing and Technology, The Open University.**

**M.H.Endean@open.ac.uk**



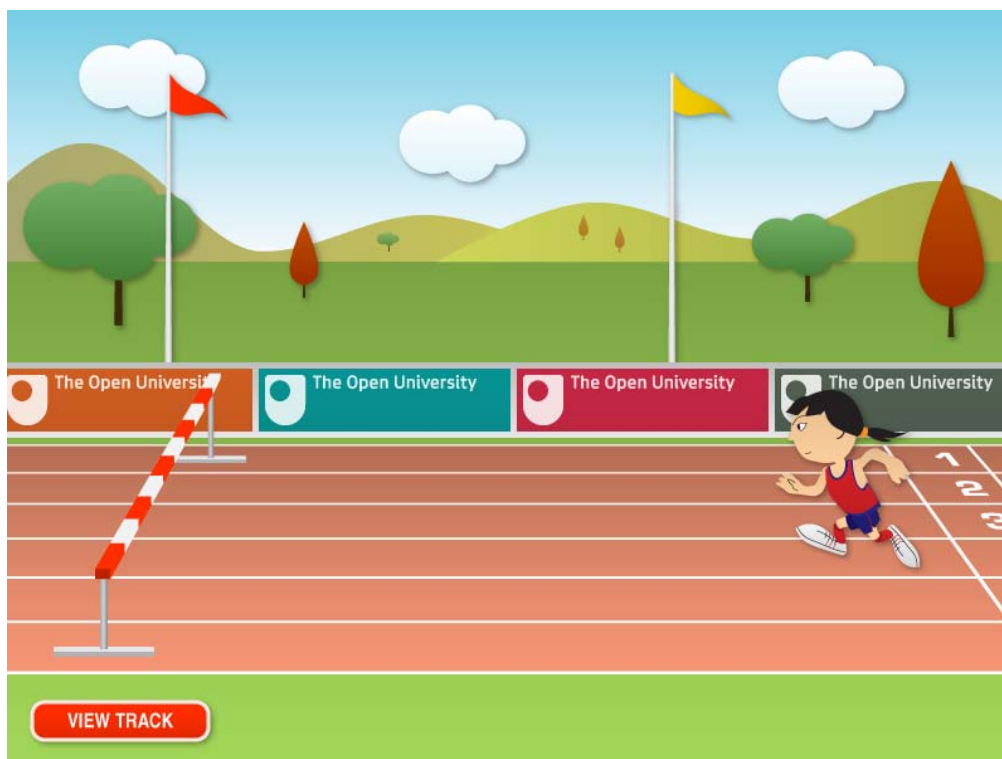
ECUST and OU colleagues sharing their experiences. Picture: Mark Endean.

# Overcoming Hurdles to Employability

2012 is going to be a year when sporting analogies will no doubt be popping up all over the place. What a perfect opportunity therefore to engage students in exploring employability skills using our very own OU Olympic animated running track.

As part of the eSTEEeM funded 'Career Development for STEM Professionals' project, we have been trying to identify interesting and novel ways to engage OU STEM students and Open Learners with issues concerning employability. The project team (Katie Chicot, Abi Lewis and Clem Herman from MCT, Liz Whitelegg from Science and Gill Kirkup from IET) have all been working on the T161 *Return to SET* module which is now in its final presentation.

As a short course that has specifically addressed the needs of STEM students in terms of employability skills, T161 and its predecessor T160 have been unique in offering a distance learning model to support those returning to work after a career break. The animated game which we have created reuses some of the activities and learning materials, which can be explored in a fun and interactive way without the formal structure of a 10 week course.



Screenshot of animated game from module T161.

There are seven 'hurdles' on the racetrack each of which addresses a different employability issue. These include improving confidence, work life balance, career planning, professional skills development, CV building, interview skills and researching the local labour market. Materials include quizzes, activities and supplementary resources and we are investigating how we can enable users to share their experiences as well as share links to more online resources and materials.

The OU now has an Employability Strategy which will soon have to be rolled out to all students, and STEM students will be no exception. The project team have been in discussion with the Centre for Inclusion and Curriculum (CIC) and the Careers Service about possible ways to use this animated racecourse to support university strategic plans and help meet targets for student engagement with employability issues.

**Written by Clem Herman, Faculty of Mathematics, Computing and Technology, The Open University.**

**C.Herman@open.ac.uk**



## The IBZL Project

THE Infinite Bandwidth, Zero Latency (IBZL) project is a thought experiment which starts with the question: “what if bandwidth (and latency – the delays in transmitting a piece of information) in communication networks like the internet didn't matter any more? What would become possible?” This idea is used as a probe for workshop participants to explore how developments in network infrastructure (often referred to as ‘superfast broadband’ or ‘next generation access’) in combination with other foreseeable technological developments such as the internet of things, 3D printing, augmented reality or semantic technologies, might allow educators to explore innovative terrains. To date, we have run three workshops, using the ‘Imagine’ method, to explore the terrain and to generate ideas for further exploration for example to the point of project proposals.

As a result of these three workshops, we are exploring two areas for potential further development. The first is examining the ability to embed digital information into artefacts such as food or textiles in fair trade chains. This might, for example, include detailed information about the environmental or labour standards under which things have been produced such that consumers and others can better recognise the consequences of their shopping habits (contact Clem Herman, c.herman@open.ac.uk for more information). Secondly, we have begun to explore the possibilities and potential consequences of incorporating hybrid digital/material resources such as 3D scanning/printing in to networked learning design. We, Elaine Thomas, Steve Walker and Paul Richardson (University of Swansea/JISC), have submitted a conference paper outlining some emerging possibilities here, and looking at the new TU100: My Digital Life module's development of the ‘Senseboard’ and Sense programming environment as what may prove a pioneering example of such applications.

We are currently organising a further three workshops to be held in OU regional centres (Belfast, Birmingham and Bristol) in December/January. If you would like to participate, please contact Steve Walker for more information.

**Infinite Bandwidth Zero Latency**  
Steve Walker, Simon Bell and Clem Herman

The IBZL: Infinite Bandwidth Zero Latency project is a thought experiment mediated by an approach called 'Imagine'..

Processes to engage, enthral and encourage creativity

IBZL is all about dreaming the dream of what Next Generation Access could mean in terms of products and services; realities and worlds; capacities and artefacts. Imagine is the medium the IBZL project team uses to facilitate this thinking process. Step by step, in a group work/ workshop context, small clusters of individuals gather, consider, imagine, construct and develop the Next Generation Access landscape.

A four phase process:

- Scope
- Plan
- Implement
- Roll out....

We have run:  
Phase 1 three times  
Phase 2 once  
And now have a phase three project – the Rural Avatar feasibility study funded, with partners Alston Cybermoor Living Lab

1. Reflect and Understand

2. Cluster and Prioritise

3. Modelling

4. Scenario Making

5. Reflect and Evaluate

**Imagine  
IBZL**

eSTEEem  
Open to challenges  
Exploring the frontiers of STEM education

The Open University

eSTEEem

eSTEEem project poster by Steve Walker, Simon Bell and Clem Herman, Faculty of Maths, Computing and Technology. Further posters can be found on the eSTEEem website under the *Projects* tab.

Written by Steve Walker, Faculty of Mathematics, Computing and Technology, The Open University.

S.Walker@open.ac.uk

## Three-dimensional Virtual World Technologies: Opportunities and Challenges

VIRTUAL worlds such as Second Life (<http://www.secondlife.com>) are three-dimensional multi-user environments that allow people to collaborate and communicate in ways not possible with phone, or audio- or video-conferencing systems. In virtual worlds, users can walk, fly, and talk in real time through text, voice and gestures via their graphical self-representations known as avatars.

Virtual worlds offer exciting opportunities in STEM education. Virtual worlds can support exploration, scientific investigation, and visualisation, and collaboration with geographically distributed users. Imagine flying around in a human cell, or walking inside the DNA molecule, or visiting a virtual planetarium in the astronomy class, or taking a tour of the seabed to learn about black smokers, or creating a 3D model of the penicillin structure, or taking a virtual geology field trip to the Sonoran desert with a team of experts, fellow students and an instructor, or learning to control instruments such as voltmeters or a telescope, and so on. The social aspects of a 3D environment support scientific discourse and dialogues at different levels such as peer-to-peer, student-to-instructor, student-to-community, and student-to-expert.



Figure 1: Conducting genetics experiments in virtual worlds; for example, the Monohybrid Cross experiment to reproduce one of Mendel's experiments.

In addition to Second Life, there are many other 3D virtual worlds and some of them are OpenSimulator based (<http://opensimulator.org/>). OpenSim is an open source software that can be used to create a virtual world and, thereby, offering control on access and the ability to make backups. The hypergrid protocol allows users to move between worlds with controlled access to private spaces within individual worlds. The hypergrid is effectively supporting the emergence of a Web of virtual worlds. There are browser-based virtual worlds too such as venueGEN (<http://www.venuegen.com/>) and Web.alive (<http://avayalive.com/WaStore/>) which run inside the Web browser and don't require users to download and install applications on their computers. Browser-based virtual world platforms tend to be more enterprise-focused and oriented towards corporate meetings and events. Another virtual world worth noting is Jibe; Jibe is a platform for creating 3D virtual environments that are accessible from the web by any computer, using the Unity3D plug-in (<http://reactiongrid.myshopify.com/products/jibeworlds> also, see <http://unity3d.com/unity/>).

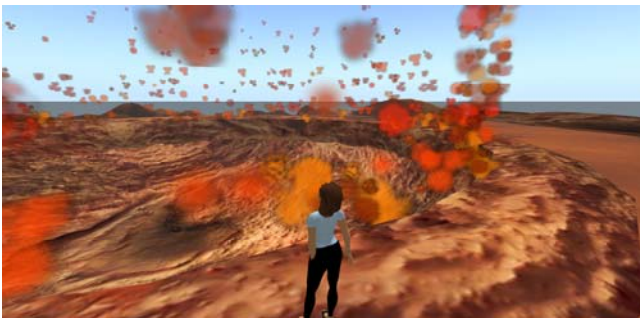


Figure 2: Watching an asteroid smashing into the planet Mars.

Each virtual world platform has its own distinctive features and applications. Choosing a right platform requires considering several aspects: open source vs. proprietary, security, stability, scalability (number of avatars a region within a virtual world can hold), availability of voice, user community, hypergrid support, in-world economy, and so on. For educational institutions, there are even more challenges such as choosing a platform that can support teaching and learning in several disciplines, training and skills required to interact with and navigate within a virtual world, support for individual creativity so that students and educators can design and build objects

within the 3D virtual world, bandwidth and computer hardware requirements, etc.

The virtual world scene is changing very rapidly and there is a rapid growth in the numbers of virtual world platforms and virtual world users. However, as of now it seems that Second Life will continue to be a destination for students and educators alongside any other virtual world platform that they choose and adopt. The communities, and opportunities for networking and public engagement are immense in Second Life and it may not be possible to replicate them in other virtual worlds in the foreseeable future.

**Written by Shailey Minocha, Faculty of Mathematics, Computing and Technology, The Open University.**

**S.Minocha@open.ac.uk**

## Crisis – What Identity Crisis?



Screenshot of ReLIVE11 in Second Life.

MORE than three years after the first Researching Learning in Immersive Environments Conference (ReLIVE) is the virtual world suffering an 'identity crisis'?

Certainly not a crisis but delegates attending ReLIVE11 found the issue of identity within immersive worlds a recurring theme during the two-day gathering of academics and industry professionals from around the world at the Open University, Milton Keynes over September 21-22.

Identity, the impact of open software on immersive worlds, how the economic situation has affected growth in the sector and much more filled presentations, workshops and symposia as well as lively discussion over lunch and tea breaks at an event that has been hailed a resounding success.

ReLIVE11 delegates were welcomed by Open University Pro-Vice-Chancellor Learning, Teaching and Quality, Professor Denise Kirkpatrick who said such conferences pushed the boundaries.

She introduced opening keynote speaker, advertising guru, Robin Wight of The Engine Group.

Drawing on decades' experience, his interest in neuroscience, some classic ad campaigns, a little audience participation and a moon-walking bear Robin linked the bad old days of the 'Mad Men' with today's two-way dialogue between advertiser and audience, on-line marketing and virtual worlds.

"This fusion of the on-line world, the off-line world, the virtual world and the real world is a really interesting area."

"The new buzz-word in marketing is game-ification," he said, which engages the on-line audience as never before.

Engagement and control in a virtual world was the 'killer app' Robin said, leaving delegates with 'the shocking thought' that their work could actually put them at the leading edge of marketing communication.

ReLIVE11 saw diverse papers presented, two of them about identity (ReLIVE11 also saw the launch of Anna Peachey and Mark Childs' significant book on the subject *Reinventing Ourselves*).

Others featured virtual quarries and courtrooms and using virtual worlds to conduct interviews for research. Two papers looked at open source software and alternative providers of virtual environments, another considered the future of conferencing within the virtual world.

All engaged their audiences, particularly Derek Jones' lively challenge of the laws of gravity within virtual reality, and supporting workshops stimulated some lively debate.

Best Paper Award went to Alfredo Jornet and Cecilie Flo Jahreie with *'Designing for Immersive Mixed Reality Learning Environments Across School and Science Museum'* with runner-up Simone Wesner for *'Fostering the Creative Potential of Project Management Education in the Creative Industries.'*

Rebecca Ferguson, Julia Gillen, Peter Twining and Anna Peachey's *'Seeking Planning Permission to Build a Gothic Cathedral in a Virtual World: Investigating a Dispute in Shome Park'* was third.

On Wednesday afternoon ReLIVE11 grappled with a recalcitrant live linkup to the IEEE VECOLab summit in Los Angeles which was investigating ways to standardise connect-ability in virtual worlds.



## eSTEEM: Reports from the ReLIVE11 International Conference



Opening Keynote Speaker, Robin Wight, with Conference Chair Anna Peachey. Picture: Greg Withnail.

Delegates were eventually able to communicate with colleagues in Hollywood though via Skype rather than in Second Life.

On Thursday a discussion panel was chaired by Director of the Institute for Educational Cybernetics Paul Hollins comprising 'Metaverse Evangelist' Ian Hughes, technology journalist Rebecca Mileham and internet writer, speaker and thinker Bill Thompson.

It considered issues including: Opposition to virtual worlds - "some people don't quite get it yet" - Rebecca Mileham; The power of technology to affect political and social change "we should look at the age we live in, it is not that the internet is having an effect, the internet IS the age we are living in" - Bill Thompson, and Engaging the public through virtual museum artefacts "you could decorate a room for an event in a virtual environment with a lovely vase as a talking piece, bringing the thing back into people's experience – and in the middle of the game you could shoot it!" - Ian Hughes.

It was Consultant IT Specialist Andy Piper's job to wrap up ReLIVE11 with the closing keynote. The theme was Back to the Future, not just how the classic sci-fi movie envisaged life in 2015 with its hover boards, and self-tying trainers, but scoping 'real world' developments to come.

With them Andy said, was the need to get more people engaged with technology, both the hardware and software.

Perhaps via the Raspberry Pie a small, simple and affordable computer for homes and schools, people could understand at least simple programming he suggested.

He then presented his own ideas of emerging trends: 3D 'printing' via machines that can replicate themselves, the merging of social media with

broadcast TV and Andy said, days are numbered for how we interact with a computer.

"Look at children, they are immediately familiar with a touch screen and will touch a TV screen expecting a cartoon character to do something,"

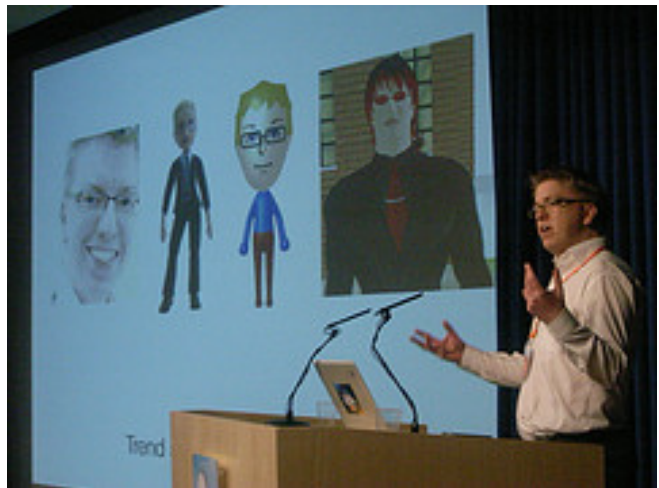
He said there could be a coming together of information gathered by the 'nervous system' of technology our society had deployed worldwide, the computers and smart phones that by accident were monitoring their global position, altitude, temperature and more. "With that information we could do better things for us and the planet."

In closing he said the question of identity, as applied to the different platforms we use, will occupy us more and more.

Some people used a synonym – especially in virtual worlds but governments and corporations wanted people having just one identifiable 'DNA stream' - people being just one person.

"There might be good reasons to choose a different name in environments but I can see why governments and the corporations may choose to restrict us."

"This identity thing is going to be a struggle and I don't see an answer," he said.



Closing Keynote Presenter Andy Piper. Picture Greg Withnail.

**Written by Steve Larner, Consultant Journalist, PressReleasePR.**

**[steve.larner@pressreleasepr.co.uk](mailto:steve.larner@pressreleasepr.co.uk)**

## Advanced Maths? – by George She’s Got It!

DURING the symposium session Reinventing Ourselves: Contemporary Concepts of Identity in Virtual Worlds, Dr Brian G Burton from Abilene Christian University in Texas raised the intriguing possibility of a ‘Pygmalion Effect’ on students’ avatars.

Can you boost a student’s ability by suggesting that their avatar is good at, say, advanced maths and they fulfil that role? Brian said he would like to explore the notion and found ReLIVE11 delegates willing to join him in further international study.

We caught up with Brian later and he told us that collaboration is exactly what made his long journey to ReLIVE11 so worthwhile. “The opportunity to meet and interact with people doing the same kind of research is invaluable,” said Brian who teaches virtual entertainment and mobile application development.

“I am very aware the US does not necessarily lead on virtual environment development. “I try not to be US centric, I want to have more of a global view on what is happening and in the States it tends to be limited to one or two institutions doing research and you don’t hear other voices.”

Brian said ReLIVE11 had shown him there is good research happening all over the world “Like the discussion today on identity, it is something I have not seen discussed very much in the States.”

“The opportunity we have here to collaborate and develop something like this is very exciting,” he said. Brian said he found the quality of the people at ReLIVE11 doing research really stood out. “Everyone I have met is in that exceptional category and I would like to think they are my peers. “It is very reassuring when you discuss things with colleagues, even if it is only to bounce off ideas.”

But couldn’t ReLIVE11 have been held in Second Life? “Yes, that’s an interesting idea. “We do collaborate virtually but there comes a time when you need to be face to face and you can sit down and toss ideas back and forth. “ReLIVE11 has created that collaboration, that sense of community,” he said.

**Written by Steve Lerner, Consultant Journalist, PressReleasePR.**

**[steve.larner@pressreleasepr.co.uk](mailto:steve.larner@pressreleasepr.co.uk)**



Dr Brian G Burton. Picture: Steve Lerner.

## Francois' Return to ReLIVE is Virtually Guaranteed



François Boeck. Picture: Steve Larnar.

FRANÇOIS Boeck is Vice-Director of the Science Circle, an international network of scientists meeting in Second Life and offering free science classes globally.

François, from Belgium but living in Spain, says he will go away from ReLIVE11 with a wider knowledge of the possibilities of open source software.

"I am not a computer scientist, I am a philosopher of information but I have learned a lot about inside technical things that are, let's say, the root of the interface that we use," he said.

François said he had found the sessions on potential migration away from Second Life to OpenSim, including the attractions and pitfalls, to be eye-opening.

"I will take back a lot of very interesting and informative things about software and data that our computer scientists will be charmed with," he said.

François said the Science Circle specialises in using virtual realities to implement academic education.

"We try to construct literal and virtual campus faculties and construct virtual degrees using virtual realities and are in the first stages of this work."

He said ReLIVE11, with its face to face contacts, was a valuable addition to links made in virtual space.

"This kind of conference gives you contacts with your peers and opportunities for collaboration. "It gives you insight on other people's work and permits you to meet all kinds of organisations," he said.

And would he attend again?

"Most certainly. I have found the debate interesting and the discussion intellectually stimulating along with the information and data I have gathered.

"I have learned there are a lot of initiatives similar to ours but more specialised. These kinds of contact should always be renewed."

**Written by Steve Larnar, Consultant Journalist, PressReleasePR.**

**[steve.larnar@pressreleasepr.co.uk](mailto:steve.larnar@pressreleasepr.co.uk)**



## The Value of the Face to Face Conference

IT might seem odd, said ReLIVE11 chair Anna Peachey, that a conference about learning in virtual worlds should be held in the real world with everything that attending a two-day event entails.

For most that meant hotel stays, for some air travel and for the hosts organising everything from refreshments to info packs.

"We could have put the papers online and gone into Second Life and chatted about them," she said.

But that would rule out the face to face meeting between academics and professionals and the valuable contacts and networking opportunities a physical event like ReLIVE11 provides.

And despite a slightly lower than expected attendance and a feeling the virtual field has not grown as anticipated following the 2008 ReLIVE, the 2011 event supported by the Open University's eSTEEeM, must be judged a success.

Anna, Director of Eygus Ltd which manages the Open University's presence in virtual worlds acknowledges the economic situation probably affected the number of attendees and has slowed the take-up of learning in immersive virtual environments including in Second Life.

"It is a hard sell at the moment knocking on an institution's door and saying 'there's this thing no one has

done anything huge with yet.

'It's innovative, exciting, we don't know everything about how it works and it's on somebody else's platform with all the risks associated with it – but don't worry about all that, come and try it,'" Anna said. "Budgets are tight and people have gone back to what they absolutely know works."

But with the high quality of the papers presented and with the workshops and symposia, almost 30 of them over two days, Anna said ReLIVE11 had demonstrated the extent and depth of knowledge, research, study and expertise within the community and that bodes well for the future.

"I hope people will have gone away with positive ideas and form partnerships and collaborations," she said.

"And the main reason for having a conference in the physical rather than a virtual world is to make those valuable physical contacts. If we have achieved that then ReLIVE11 has been a great success."

**Written by Steve Larner, Consultant Journalist, PressReleasePR.**

**[steve.larner@pressreleasepr.co.uk](mailto:steve.larner@pressreleasepr.co.uk)**



Anna Peachey and conference delegates deep in debate over coffee. Picture: Steve Larner.

## Virtual Worlds for Education - A No Brainer!



Anna Peachey welcomes delegates and guests to the conference. Picture: Greg Withnail.

IN the three years since the ReLIVE 08 conference, many changes have taken place in the field of virtual worlds education.

Although the hype surrounding them has dissipated, the community of practitioners who use them in day-to-day education has expanded, and acquired a

greater understanding of the ways in which they can add value in education.

The debate has moved on from “can we use virtual worlds in education?” to “in what ways can we best use them?” ReLIVE08 led that change in perspective by focusing on research that was reflective and academic, not simply a “show-and-tell” of activities and ReLIVE11 captured much of the change in perspective that has occurred in the intervening time.

Over the two days of the conference, two keynotes, 24 papers, four workshops and two symposia were presented and from these several themes emerged.

The first of these was how to manage the new diversity of virtual worlds. In 2008, almost all the education was being conducted in just one virtual

world, Second Life. With the growth of alternatives, the papers looked at how to make these various worlds interoperable, not just from a technical point of view, but how to establish the generic skills for learners to be able to function in any virtual world.

The subject of defining virtual worlds also recurred at several points throughout the conference, including the opening keynote and in the panel discussion, and it perhaps shows a more confident position in the community that more flexible definitions are being considered.

Finally for someone whose research interest is the role of identity in virtual worlds, it was gratifying to see the central role that concepts of identity are playing, not only in the way in which learners are taught in virtual worlds, but also in the way that practitioners engage personally. That sense of virtual worlds being a *personal* experience for the delegates permeated the conference more than it does conferences positioned around other technologies. ReLIVE11 reaffirmed for me what an exciting, novel and social experience teaching and researching in virtual worlds can be.

**Written by Dr Mark Childs, Senior Research Fellow Elearning, Faculty of Engineering and Computing, Coventry University.**

[mark.childs@coventry.ac.uk](mailto:mark.childs@coventry.ac.uk)

**To catch up on the ReLIVE11 conference please visit the archive website: [www.open.ac.uk/relive11](http://www.open.ac.uk/relive11)**



Second Life screenshot of the opening concert performed by Xi Yang.

## Workshop Report: Charts @ OU



One of several web-based chart producing tools (screenshots by Tony Hirst).

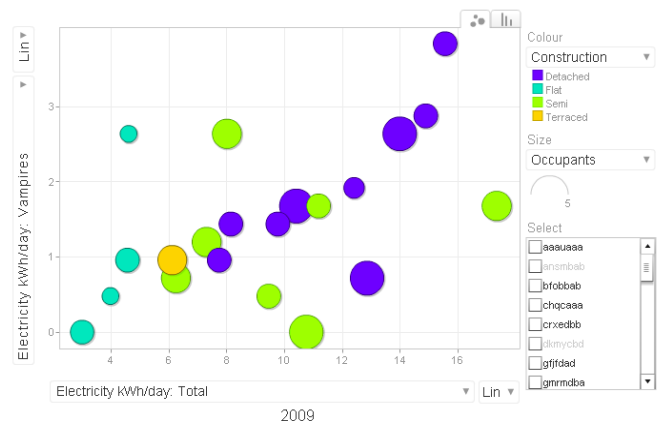
THE eSTEEeM iChart (Interactive Exploration of Data Charts) project will use modern technologies to develop a tool that allows the production of interactive and multimodal charts, graphs or diagrams. This will allow users to better understand and engage with the presented data and will make charts more accessible to disabled users. To kick-start iChart's activities, we organised a workshop in late July 2011 to survey the state of practice at the OU regarding charts and diagrams and to make a 'wish list' of features for the iChart tool. 20 participants from MCT, Science, Health and Social Care, LTS and the Library attended.

Among the presenters, Karen Vines (Statistics) showed examples of charts and plots used in Maths modules, Jane Collinson (Library) argued for the need to include meta-data about the data's context and provenance, Pete Mitton (LTS) discussed technical issues to consider for implementing a tool and integrating it into the VLE, Sue Pearce (LTS) explained the support available for module teams on accessibility issues, and Tony Hirst (Communication & Systems) presented many existing chart-producing tools and their pros and cons (client- vs. server-side, location of data, programming requirements, etc.).

During the group discussion, both technological and pedagogical issues were highlighted. While there is a wide variety of subject-specific graphs and plots, Excel and its types of charts seem to be the most widely used due to their availability and familiarity. Several modules have made advances in addressing disability (e.g. by using specialised software for the blind), but there remains much scope for improvement.

Graphs are used not just for teaching concepts but also as a decision-making tool. Participants would like the iChart tool to be future-proof by adopting standard formats and technologies and making the tool open source (or building it on open source platforms). The tool should allow students to actively explore and query the data, make annotations and share them with other students, in order to tell a story. The data source and any transformations made on data should be traceable, which poses a problem for third-party off-site data. Cooperation with LTS will be essential to make the tool work both offline and online, within VLE-supported pedagogical activities.

Cooperation with LTS is probably a recurrent issue across several eSTEEeM projects and we feel it could benefit from a systematic approach, especially regarding resources (e.g. development time). We also would welcome an eSTEEeM repository for projects to deposit outputs (e.g. this workshop's slides and extended report) and make them easily available within the OU.



Google Motion Chart used in T152 to track idle gadget energy consumption (screenshot by Malcolm Fowles).

**Written by Michel Wermelinger and Paul Piwek,  
Faculty of Mathematics, Computing and Technology.**

**M.A.Wermelinger@open.ac.uk,  
P.Piwek@open.ac.uk**



# Workshop Report: Education for Employment

THE objective of the Exploring Online Learning at Work workshop, which was held on the 5th July 2011, was to provide a perspective on the learning experiences OU students are exposed to in their employment with contributors from major companies and e-learning providers. Laura Overton leads the Towards Maturity organisation ([www.towardsmaturity.org](http://www.towardsmaturity.org)) that conducts benchmarking and consultancy activity in the application of e-learning.



Figure 1 - Technologies in use by employers - from 2011-12 Towards Maturity Benchmark.

Lars Hyland of EPIC one of the UK's largest commercial developers of e-learning discussed their work on development of mobile learning materials for NHS. He outlined that the benefits that mobile learning delivers to business include convenience, reassurance (given that learners have timely access to the right information when they need it), relevance as learning takes place in the context of the work setting, speed of access and confidence in applying learning back at work. They have the potential to be used in a range of learning scenarios:

- Induction
- Performance support
- Supporting behavioural change
- Improving customer service

They also have a significant role in assessment and ensuring that staff are operating to best practices. Mobile assessment can range from intelligent pre-assessment, multichoice (using photographs as well as text) through to the collection of video evidence. Whatever mechanism used, assessment needs to be flexible and meaningful to the individual if the full power of mobile learning is to be harnessed effectively.

Iain Napier of BT estimated that there are over 1.6 million years of contextual knowledge within their current staff members and if the company is to succeed, then it is important to connect people who want to know about 'stuff' with those that already do. Social media provides an opportunity to facilitate them so that they take part in the open so that

others can benefit. Individuals can capture and share knowledge via Share Point and Dare2Share, their podcasting platform that enables great content to rise to the surface via a rating system.

Dave Briggs, former online evangelist at Learning Pool ([www.learningpool.co.uk](http://www.learningpool.co.uk)) an e-learning organisation serving the public sector highlighted the importance of online communities to encourage learning in the workplace. He believes that online communities provide the human side to technology. They provide an opportunity for individuals to get involved when time is tight. Here are his top tips:

### Lessons for establishing communities in the workplace

*Ensure that communities are owned by members not just organisations*

- Go to where people are already gathering
- Identify and meet the needs of community members
- Encourage self ownership
- Create spaces that others can use, where you go to get stuff done
- Create a magnet for the community – providing an opportunity to get things they can't get elsewhere
- Gather and share success stories to encourage ongoing change

### *Encouraging engagement*

- Seed with a variety of content so that early visitors immediately have something to search for and engage with
- Build your community offline as well through steering groups, conferencing and networking events
- Consider the role of evangelist – someone who has a passion about getting people involved
- Don't ignore email as a route to engage
- Promote the activity within the community, not the organisation behind it

### *Consider tone and style*

- Collaborative and open (not just company news)
- Encourage useful content not just trivia

Hal Igarashi and Peter Chatterton shared their views on the effectiveness of university interactions with employers in the engineering sector and with SMEs.

Discussion sessions using the IMAGINE methodology surfaced ideas for further development of work focused STEM learning.

**Written by Keith Williams, Faculty of Mathematics, Computing and Technology, The Open University.**

**[K.Williams@open.ac.uk](mailto:K.Williams@open.ac.uk)**

## eSTEEeM News...

eSTEEeM will be launching its new look website in December, further details will be circulated in due course.



The latest call for projects within the strategically important area of engagement saw a total of 12 proposals across the two faculties, please see Rick Holliman's front page article for an update on engagement. Plans will now be reviewed with projects due to start in early 2012.

The first meeting of the eSTEEeM External Advisory Group took place on the 7th September 2011. With strong representation from external stakeholders possessing both national and international interests, this meeting proved extremely useful in reviewing our progress against milestones between August 2010 and July 2011 as well as identifying priority actions for 2012 and possible collaborative ventures.

The last few months have also seen three projects securing external funding. A bid to the HE STEM Centre entitled *Workforce Development for the Nuclear Industry*, led by Liz Whitelegg and Sam Smidt, was successful. A further two bids to JISC which focussed on developing browser-based microscopes as open educational resources in earth sciences and biomedical sciences, were also successful. The *Histology and Histopathology* project will be led by Professor David Male (Faculty of Science) and the *United Kingdom Virtual Microscope (UKVM)* project will be led by Professor Simon Kelley and Dr Andy Tindle (Faculty of Science).

We are delighted to announce the appointment of Dr Kat Garrow as eSTEEeM Manager. Kat is from the Faculty of Science and joins the team on a seconded basis until September 2012 whilst Catherine Reuben is on maternity leave. An experienced Curriculum Manager in Science, Kat has successfully managed several courses in production over the last four years and will be a great asset to the team.

**\*\*\*Don't forget to join our mailing list to be kept up to date on the latest developments, email [esteem@open.ac.uk](mailto:esteem@open.ac.uk) with 'Mailing list' in the subject header\*\*\***

**If you would like to contribute to the next edition please send your article of no more than 300 words to the Editor at [esteem@open.ac.uk](mailto:esteem@open.ac.uk) by the 10th February 2012.**

### Forthcoming Events...

**CREET/eSTEEeM Colloquium: Exploring the Scholarship of Engagement**

6th December 2011, 9:00 - 17:00, The Open University

**Geospatial Technologies in Higher Education: Saviour or Sideshow?**

18th January 2012, 9:30 - 17:00, The Open University

**The 1st eSTEEeM Annual Conference**

6th March 2012, The Open University

**Diagramming Colloquium**

7th March 2012, The Open University



ReLIVE11 symposium delegates. Picture: Greg Withnail.

### Provisional dates for your diaries:

**eSTEEeM Community Event: Educational Threshold Concepts**

15th February 2012, The Open University

**International Workshop on Mobile Learning**

29th March 2012, The Open University

For further details on these and other upcoming events please visit the eSTEEeM website: [www.open.ac.uk/esteem](http://www.open.ac.uk/esteem).

## All about eSTEEeM...

eSTEEeM brings together STEM academics to promote innovation and scholarship. We are working in four priority areas:

- Education for employment – working with employers, sector skills councils, professional bodies, HE STEM agencies etc.
- International STEM education – promoting conversations about international challenge in supply of STEM graduates, associated teaching and learning models, and scholarship opportunities.

- Engagement – promoting innovation, development and associated scholarship.

- Enterprise – identifying opportunities to use OU expertise in STEM education In spin-out activities and resources.

Much of our work centres on the effective use of learning technologies at scale - our portfolio of projects includes work on e-assessment, mobile learning, online laboratories and the use of virtual learning environments. We welcome partnerships and are already

working with universities and other agencies both within and outside the UK.

### Contact us:

**Email:** [esteem@open.ac.uk](mailto:esteem@open.ac.uk)

**Tel:** - +44 (0) 1908 655792

**Address:** Room 115A, 1st Floor, Perry E Building, The Open University, Walton Hall, Milton Keynes, MK7 6AA