Project Team

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Creative Learning Journeys

STEM HE SW has commissioned Dovetail, a creative social enterprise, to capture the learning experiences, learning outcomes and reflections of people engaging with our projects. The process began with our first seminar with photographic and interview resources being developed. The creative materials gathered will be available online in an exciting new website which will also capture learning journeys from across a number of STEM SW projects as they progress. This will enable us to see themes emerging and broaden the reach to a wider learning community.

For progress so far have a look at **www.creativestem.co.uk**.

Next Steps

For more information contact Chris Keenan or any other working group member.

Further information about these and other STEM projects is available on the SW region website **www.hestem-sw.org.uk** and on the national HE STEM website **www.hestem.ac.uk**

Join networks **ldhen@jiscmail.ac.uk** and **stem-sw-fye@jiscmail.ac.uk**

To join the retention network, send your contact details to **retention@actiononaccess.org**

If you would like to contribute to or attend future seminars contact Chris Keenan.

If you are doing work to improve student retention and success in STEM disciplines and would like this to be included in future briefing documents, contact Chris Keenan.

Useful Reading

Davies I. (2004). "E-xperience in E-learning: The Impact of a Peer Assisted Online Mentoring Scheme on an E-learning Programme: A Case Study of E-College Wales". Proceedings. Networked learning content 2004. http://www.networkedlearningconference.org.uk/past/nlc2004/proceedings/individual_papers/davies.htm

Huijer H. (2008). "Peer Assisted Learning in Fleximode: Developing an online Learning Community", Australasian Journal of Peer Learning , 1 (1) ,51-60.

Jeris L. (2002). "Comparison of power relations within electronic and face-to-face classroom discussions", Australasian Journal of Adult Learning, 42 (3) , 300-311.

Keenan, C. (2011) Bizareness, collisions and adjustments IN Morgan, M. (Ed) Improving the Student Experience: A practical guide for universities and colleges Routledge Oxon

Mathematical Sciences HE Curriculum Innovation Project Blog. Updates from Peter Rowlett on his project. http://mathshe.wordpress.com/

Rowlett, P. (ed.), 2011. HE Mathematics Curriculum Summit. MSOR Network. http://mathstore.ac.uk/?q=node/1730

The autumn 2011 issue of MSOR Connections is a special issue around mathematics curriculum work supported by the National HE STEM Programme. This is available online via: http://mathstore.ac.uk/node/1705

Waldock, J. (ed.), 2011. Developing Graduate Skills in HE Mathematics Programmes - Case Studies of Successful Practice. MSOR Network. http://maths.shu.ac.uk/msor/graduateskills/

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Bournemouth University

National HE STEM Programme

Stepping Stones 2STEM

Peer Assisted Learning: in and beyond the classroom

Exploration and enhancement of transition and induction experiences of students starting on HE STEM programmes in the SW region

As a group STEM students are less likely to continue to a second year of study than students following other subjects (NAO 2007). These projects aim to improve the experience of students studying HE STEM subjects and increase retention through enhanced experience.

APRIL 2011

July 2011
Briefing Document 1

December 2011
Briefing Document 2

March 2012
Briefing Document 3

April 2012
Briefing Document 4

APRIL 2012

Being a PAL contact on the Computing Framework at Bournemouth University

Suzy Atfield-Cutts and Heather Mayes

Being a PAL contact is part of our role as joint First Year Tutor on the Computing Framework. Our freshers get to know their PAL leaders from induction week onwards as we get them involved in lab induction and they happily get stuck in to helping students and chatting as they go. We meet with PAL leaders during induction week to ensure they are confident about what they are doing, to sort out how they will team up and who is available for the sessions timetabled for the first years. The PAL leaders have access to the assignment calendar and first year materials on our VLE (myBU), the training provided by the university central team gives them everything else they need.

We meet with them fortnightly to get feedback from them and give them any news we have for them about what the first years have coming up. These meetings usually become less frequent in the spring term. We always stress that they are not to teach but to facilitate learning, lead discussions and guide students towards solutions.

Our biggest bugbear is matching second years availability to first year timetables. However, we know it's all worth it when we hear the first years talking about where it has helped them and asking how they can become PAL leaders themselves.
hmayes@bournemouth.ac.uk

Asha and Dan – PAL Leaders on the Creative Technology Framework at Bournemouth University

We felt that becoming a PAL leader would complement our CV quite well, as well as improving our confidence when addressing groups of people. Also we felt it would enhance our own learning by covering previous material and refreshing our knowledge. The training we received prepared us with an array of resources which we could apply to our sessions, and use to interact with students on a variety of levels. At first we were nervous as it was a daunting prospect to be faced with a group looking to you for advice and assistance, but after the initial sessions, and utilising the training to build a relationship with the students, the sessions became more comfortable. The benefits for us include skills gained in:

- Communication
- Preparation and delivery of content
- Listening to issues and devising solutions independently

The experience of being a PAL leader has given us many transferable skills which enhance our employability. We feel that we can draw on our own experiences to help the students' learning by covering areas where there are difficulties like programming, in a more informal manner. Students can use PAL as a forum to bounce questions off us and each other that can't be asked elsewhere about academic studies and also about university life.

News about the Second Regional Seminar held on 23 November 2011

The second of four seminars took place on 23 November and was attended by over 30 delegates. There was plenty of enthusiastic discussion with many ideas being shared and opportunities for networking and collaborative working identified. To see presentations visit: **www.hestem-sw.org.uk**.

Dr Diane Nutt (Teesside University and chair of the international FYE Conference) talked about the importance of the first year experience and talked through a number of priorities. First year students rarely leave because of one single problem; rather there are often multiple reasons around the notion of settling in, fitting in, developing academic confidence and building social groups. It was very helpful to see this in the wider European context and there were plenty of examples to stimulate our thinking. **diane.nutt@tees.ac.uk**

Dr Ria Symonds (Nottingham University) described how targeted support for students with non-traditional mathematical backgrounds can improve retention. Students who may previously have failed mathematics units are supported by small group tutorial sessions led by postgraduate researchers. This model of peer support helps weaker students to achieve a pass where previously they would have been likely to fail. For more information about this project work, see www.hestem.ac.uk/activity/proactive-intervention-facilitate-transition-he-engineering-students-non-typical-mathematic
ria.symonds@nottingham.ac.uk

Dr Makis Maliris (University of the West of England) spoke about the development of online PAL. Currently he has four online PAL leaders working with part-time students. The PAL leaders have not had specialist training in being an online PAL leader other than in the use of the technology, but through this project, Makis is developing interpersonal understandings of the on-line world. He is working with sociolinguists at UWE to analyse PAL session discourses and to gain a better understanding of the skills and attributes that online PAL leaders will be developing. Further information about his work is given on page 4 of this brochure. The online socio affective domain of online peer processes are not well understood but important to think about as the online environment has huge potential for peers working together. **efthimios.malliris@uwe.ac.uk**

Steve Parton and **Vicky Noad** (Bournemouth University) provided an overview of PAL leader training at Bournemouth University. New PAL leaders are given two days of training which includes opportunities to try various activities and techniques they can apply in their own sessions to lead effective group discussion. PAL leaders are provided with a scaled down paper manual containing hints and tips, and examples of practice, with further resources being available on the PAL Central website. Bournemouth PAL leaders are also supported by PAL contacts who work closely with them and support their development and day-to-day PAL activities.
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Chris Keenan (Bournemouth University) described an approach to supporting developmental transition to HE. Providing students with appropriate information prior to arrival helps them to understand student life at university. The provision of discipline specific learning activities prior to arrival enables students to actively engage in the transition process. When these activities are developed through social and collaborative learning activities during induction week, students are offered a pro-active and engaging introduction to study. The students can take ownership of their transition and together produce some output, eg. a poster, presentation, in order to extend their learning to the rest of the group. Evaluation studies have shown that these type of developmental activities improve academic and social confidence with firm friendships often resulting. **ckeenan@bournemouth.ac.uk**

For further details of the topics covered in the seminar group discussions and for delegate feedback visit:
www.hestem-sw.org.uk

Dr Genoveva F. Esteban: Generating a fascination for micro-organisms in freshwater

Tell us about your career in STEM

"I am an academic at Bournemouth University, School of Applied Sciences, in the Conservation Ecology and Environmental Sciences Group. My specialism is research in Biodiversity at the microbial level in order to understand and predict the functioning of aquatic and terrestrial systems."

Why did you decide to become a STEM Ambassador?

"I wanted to help promote science to school children and encourage them to take up science careers."

What activities do you do with schools?

"The children love to see micro-organisms – 'pond life' - through a microscope, and enjoy coming to the lab and seeing all the scientists at work. I put everything into context so they can see how micro-organisms affect their lives though the food chain and when they go to the supermarket."

How does being an Ambassador benefit you and your organisation?

"I find it very rewarding to see the children being enthusiastic and interested in what I show them. They are inspired by the thought that we might find a completely new species!"

Genoveva's achievements as a STEM Ambassador

Genoveva was shortlisted for the Most Dedicated STEM Ambassador of the Year award in 2010 at a ceremony at the House of Lords, beating 21,000 other Ambassadors nationally. Recent events and activities in which Genoveva has been involved include:

- Dorset Area Schools Partnership Saturday Science Fun days held at Dorchester Middle School, St Osmund's Middle School and Thomas Hardye School
- Science skills challenge (pond dipping) for Year 8 pupils at Puddletown St Mary's Middle School and school visits to East Stoke River Laboratory
- Sixth form convention for potential biologists.

In the last year Genoveva has engaged with over 2,000 school children, students and their families, impressing them with her 'infectious enthusiasm' and igniting the next generation's passion for science.

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If you are interested in becoming a STEM Ambassador, or for more information about the work STEMNET does please visit www.stemnet.org.uk

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Online PAL Research: Aims, objectives and background

Peer Assisted Learning (PAL) is an academic support scheme where second year students (PAL leaders) pass on their experience and knowledge of the course to new students. This support takes the form of an in class meeting between the PAL leader and a group of about ten first year students. This format means that students studying part-time or by distance find it difficult to participate and may miss out on the PAL experience. It can also prove difficult to timetable these PAL sessions to suit all of the participants and to find a suitable room.
The online PAL pilot is examining the effectiveness of delivering PAL online. The pilot will take a blended approach and some sessions will still be delivered in class.

The aims of the research project are to:

- Evaluate whether PAL can be delivered effectively in an online format
- Evaluate the suitability of the chosen software for online PAL delivery
- Evaluate the impact that online PAL delivery has on the workload of the PAL leaders
- Investigate whether online delivery affects the group dynamic during a PAL session
- Investigate how online delivery of PAL might affect how knowledge is transferred amongst the group
- Consider the experiences of both the PAL leaders and student participants in all aspects of the evaluation and investigation
- Determine the scalability of online PAL for future roll out.

Four PAL leaders and 20 part-time volunteer participants from STEM courses have been recruited for the online pilot. All these students have a good understanding of what the pilot will include and how the proposed research will be conducted and have had an induction to the online software platform.

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Work in Progress: STEM Projects

STEMNET Ambassadors

A key component of the Transition to HE STEM programmes project is to learn from the experiences of STEMNET Ambassadors who support students in schools across science, technology, engineering and mathematics. These Ambassadors have unique insights into the perceptions of young people about science. The work they do with young people has potential to enthuse, motivate, and open a window to a world that may not have been explored before. A total of eight Ambassadors have already taken part and a detailed case study is to be developed and made available on the stem-sw.org.uk website when it is complete. Meanwhile here are some of their thoughts as an appetiser!

Potential students are not always aware of the variety of courses, jobs or careers available to them

"People don't always realise what's on offer. I wish I'd known at a younger age that I could do something like computer science – I didn't really know what I liked doing at school and what I wanted to do so if I can make it less of a mystery to school students maybe they won't be in the same situation as I was."

What is a STEMNET Ambassador?

"Somebody who is trying to enthuse the next generation of possible scientists and let them know what's out there. There's a perception of scientists as being dull people in lab coats with not very interesting jobs and when you are trying to learn some of the nitty gritty of science at school you don't see beyond that. There's amazingly fun things to do with your life if you've got those qualifications and it's just trying to inform and enthuse young people about science"

What sort of things do STEMNET Ambassadors get asked about?

"What's an engineer? Is it like building big structures, putting pipes in the ground?"

"They questioned me about what I do – what actual science I do and what's a lab like?"

What do you think puts young people off studying STEM subjects at university?

"A lot of people don't think about the vast options that are actually out there and the school system forces you to specialise too early into GCSE and A levels. If you're going to be a scientist you have to make that decision quite early. Not having a broad understanding of all the options is a barrier."

"A lot of young people are very aware of how difficult sciences are; it is a very competitive area and a lot of students are a bit afraid of appearing not intelligent."

What do you think that universities can do to help?

Set very clear expectations - help students to see the bigger picture

"Students might think 'Why do I have to learn all this maths and organic chemistry? That's not what I'm going to be doing'. As a working scientist you don't sit there and try to figure out how you know atoms bind together. It becomes very different at a later stage and I only realised that by talking to people about what they do. I can see why people would drop out before they get to that stage."

Help students set achievable goals

"It would be useful to give new first year students ideas of what they could be aiming towards for their final year project or the range of possibilities their degree could unlock for them."

STEM students would benefit from an open door policy, knowing that someone would be available to help them when help is needed.

"An open door discussion with a tutor can help students understand feedback and think through questions that they could be asking to help them do better next time. This would help them cope with the difficult bits of the course."

Provide peer mentors

Some STEMNET Ambassadors said how important PAL had been to them as students. The opportunity to work with higher level students had helped them through difficult aspects of the course.
"We had peer assisted learning from mentors. It was useful to get to know someone who'd already done it to talk you through if you were struggling."

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The Mathematical Sciences HE Curriculum Innovation Project

Much of the work we are supporting is a result of recommendations for curriculum development in mathematical sciences that emerged from a high level summit in January 2011. Recommendations included major work on assessment, problem solving and making industrial problems available to the HE community. All the supported projects can be contacted via the list at **http://mathshe.wordpress.com/funded-projects/**.

Some examples of this work are given below. For further information on all the areas of work in the Mathematical Sciences HE Curriculum Innovation Project visit **www.mathstore.ac.uk/hestem**

- We have two pieces of work looking at the mathematical element of transfer to HE for engineering students. At Loughborough, one project is looking at engineering students' understanding of mathematics and another at Blackburn is enhancing a mathematics bridging programme for incoming engineering students.
- A study at Sheffield Hallam collected 17 case studies of curriculum interventions to develop graduate skills in HE mathematics programmes. These are available in a booklet (Waldock 2011). A Developing Graduate Skills Uptake Programme is supporting a series of mini-projects to take up ideas from this booklet around graduate skills development, careers awareness and self-reflection.
- A successful Maths Arcade has been established at the University of Greenwich. This aims to stretch more confident students while supporting those who are struggling, and to encourage interaction between students and staff outside of the curriculum. This provision has had some success enabling students to adapt to HE. This can offer help to students who are reluctant to attend branded 'help sessions' due to a perceived stigma. A Maths Arcade Uptake Programme is supporting four new Maths Arcades at Keele, Leicester, Salford and Sheffield Hallam.

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Moving from "induction" to "transition"

An "Enhanced Induction Project" (TQEF funded) has led, through 4 years of institutional development, to a new University of Greenwich policy on New Arrivals and Transition.

Key features of the policy are:

- The move away from a pre-term "induction week" (and away from the language of "induction")
- The move to a more integrated and extended approach to transition.

Students are keen to meet their tutors and start on their studies, in addition to wanting and/or needing a range of orientation, social and support activities. Provision of a "First Week" combining these elements is embedded through:

- A statement of new students' entitlement.

The statement of entitlement emerged from cross-institutional consultation with staff who work directly with new students, and reflects best practice and students' feedback. Structured around pre-arrival provision, First Week activities and on-going transitional support, it emphasises that new students need to

- Be actively engaged, rather than introduced to HE in a passive mode
- Be offered opportunities for student-student and student-staff interactions
- Have their expectations - and ours – explicitly discussed
- Be given information through staged and limited processes, focussing on the most immediate needs and that these needs continue and should be addressed throughout the first term at least.

Our Maths department is one example of good practice and there is little doubt that this contributes to their very good retention and success rates. Their strong mentoring scheme combines socialisation, orientation and academic activities, with group modelling activities in the first week feeding into coursework. Students and staff have responded positively to these innovations, with reports of significant improvement in attendance and participation during the First Week and ongoing enhancements in provision (for example, a staff-student BBQ in Science, which has now become shared with Engineering, and a mid-term Review Week in Computing Science programmes).

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Work in Progress: In the Sector

Disability Mentoring Pilot Project at the University of Bath

Transition to higher education for young people with Specific Educational Needs (SEN) and disability is complex and requires practical ideas and strategies to improve outcomes. The University of Bath Disability Mentoring pilot project took place during the last academic year and our focus was to enable young learners with SEN and disability to achieve their full potential.

The University of Bath delivers a wide range of inclusive activities to school pupils. Whilst an inclusive agenda is a paramount for every activity, it was recognised that pupils with SEN and disability require a discreet element of intervention in raising their aspirations and confidence to progress to higher education. Our experience also suggested that the maximum outcome for school pupils with SEN and disability would be achieved if mentor and mentee had the same disability.

Potential benefits to learners

- An opportunity to share an experience in overcoming similar barriers
- An interaction with a positive role model
- Work towards mentee specific needs (goals): enhancing communication skills, gaining an understanding of the DSA process, understanding the value of higher education experience and qualifications
- Opportunity for mentee to learn about the right course for them as well as the right university/college
- Addresses in discreet ways learners' concerns about higher education.

Operational learning and experience within the WP team

- It was a challenge to co-ordinate mentor-mentee interactions as a result of their disability
- Maintaining the interest of the interactions, for example in a case of autistic disorders
- Challenges in keeping short gaps between the mentor-mentee interactions
- The need of input from a third party, such as WP team member, school teacher, parents, to encourage participation on some occasions.

Project learning outcomes from the WP team

- Recognised great value of the scheme as a result of the feedback analysis from mentors, mentees, school teachers and demand for the continuation of the scheme
- It is not essential for the mentee and mentor to have the same disability
- Greater outcomes achieved in the cases when mentor and mentee shared similar interests and hobbies
- Training for mentors has to be carefully designed and specific
- Essential on-going support and guidance from the WP team member to mentors for delivering the maximum positive outcomes for the mentee.

The mentoring programme is an important stepping stone for learners with SEN and disabilities in the process of progression to higher education. It enables them to explore various opportunities and pathways to achieve their full potential, and consider subjects that they might think are not possible for them to take further. Therefore, universities need to remember the value of disability mentoring.

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