Aberystwyth University hosted SUPI

Blended Learning Environments for Active Engagement: How Online Resources Can Help Schools and Universities to Collaborate

Dr Paula Hughes

From the start, the Aberystwyth SUPI team realised that teaching time for the A-Level students they wanted to work with would be at a premium; Paula Hughes explores how online resources helped overcome this problem by creating a sustainable mechanism for researcher-pupil interaction.

Background to the SusNet project

The Sustainability Network Wales (SusNet) project enables Sixth Form students in Ceredigion to engage with a range of exciting, research-led academic modules, delivered by departments across Aberystwyth University. Although diverse in content, each module shares the common theme of sustainability and/or social responsibility. The modules differ in format, but each uses a blended learning environment for delivery that combines face-to-face and online learning activities (providing a total of 10 hours 'contact' time).

The online activities are delivered through the university's Virtual Learning Environment (VLE), Blackboard, which is available 24/7 and creates an accessible and flexible working environment for pupils and researchers. The use of online submission tools and resources has proved invaluable as many Ceredigion pupils live in rural communities. Examples from the biology and geography modules, both now in their second year of delivery, show how these online resources work in practice.

Drug Resistance in Nematode Worms

Designed by Dr Joanne Hamilton and Dr Elizabeth Hart, this award-winning module* investigates the concept of drug resistance in parasitic nematode worms. Face-to-face sessions are scheduled after school and provide students with experience of microscopy, experimental design and execution, molecular biology and bioinformatics. Being practical in nature, this module has a relatively high proportion of face-to-face contact time with a total of six 1-2 hour sessions. There are also tours of world-class research facilities such as the National Phenomics Centre, Next Generation Sequencing and Advanced Bioimaging, which require the students to visit the University.

Blackboard supports each session with additional material such as experimental protocols, links to research papers, video clips and A-Level revision notes (see figure 1); we have also made short videos of some of the tours for students who are unable to attend in person. Students submit their assignments via Turnitin and receive feedback from tutors electronically. Pupils commented that it was a 'fun, fantastic opportunity' to do research.

Sustainable Water Resources: Barriers and Solutions

This academic unit was designed and delivered by Dr Hywel Griffiths of the Department of Geography and Earth Sciences (DGES). During the introductory session students are encouraged

Dr Griffiths with teachers and Geography A-Level students attending the Welsh-medium introductory session in DGES

to explore web-based, open-access data sources and tools available to address some of the barriers to water sustainability. Students are also shown how to use a simple soil-vegetation-atmosphere model (SimSphere) in order to attempt to forecast climatological and hydrological variables. This is supported with material on Blackboard, including video clips, instructions on how to access and use SimSphere, and links and instructions so that students can construct their own flood chronology using sources such as the National Library of Wales' Welsh Newspapers and the British Hydrological Society's Chronology of British Hydrological Events. The introductory session is recorded (both audio and video) using software called Panopto and made available to the students on Blackboard. This provides an excellent resource for the students to review the session and makes it possible for absent pupils to get involved later on. After the online tasks are completed, a field trip to Cwymystwyth allows students to construct a lichen growth curve and uses geomorphological mapping and lichenometry to date boulder berms associated with large historical floods.

Benefits to pupils and researchers

Engaging with Blackboard and Turnitin provides the students with training and experience of using a VLE; raises issues of citation and plagiarism; builds pupil confidence; and provides a taste of real University Student Experience.

The VLE also facilitates more effective communication with the students: staff

> *We have found that the project has benefited the school in a number of ways: pupils have been able to use lab equipment that is not available in school; they have gained a taste of university study... they have been able to try courses beyond the subjects on offer in school and in several cases have realised that university study is not beyond their reach...* **Sarah Payne, Head of Sixth Form, Penglais School**

* Dr Hart received a commendation for the design of this module at the 2014 Aberystwyth University Exemplary Course Awards
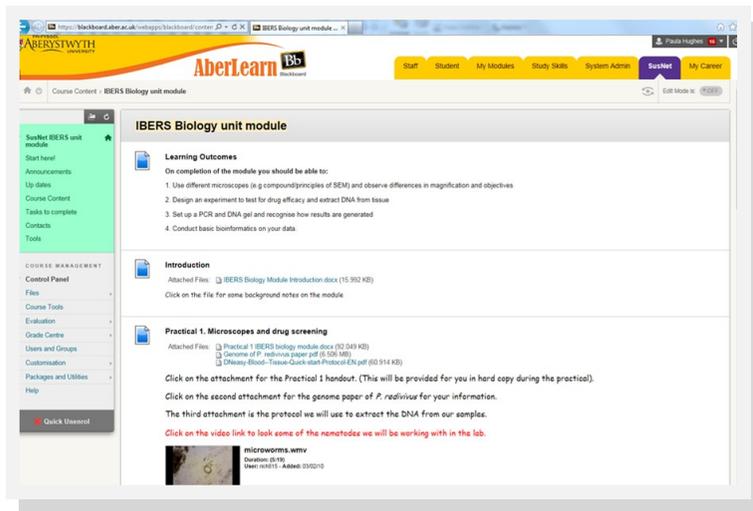
Figure 1: Screenshot from Blackboard showing learning resources to support practical sessions on the biology module

can send email updates and announcements directly to pupils registered on specific modules, or to everyone taking part in the SusNet programme. Turnitin provides added flexibility and convenience because students can submit assignments or access marks and feedback from anywhere without being restricted by office hours. Staff can mark when most convenient for them, with the 'Quick Marks' feature in Turnitin making this process as efficient as possible (figure 2).

Challenges encountered

During the first year of the project there were problems in ensuring that all pupils could access Blackboard, which stemmed from the way that Information Services (IS) required SusNet students to activate their accounts and set passwords. Working closely with IS, we now have a system in place where our students complete a specific SusNet IS access form and then have their username and password sent to the project co-ordinator to be passed to schools. This has resulted in all students having access to Blackboard during a module and has increased the submission of final assessments.

SusNetability: Plans for the future

The key to creating successful blended learning environments has been to have our Blackboard and E-learning team on board from the start. This team forms part of our SusNet Advisory Board and 'bought in' to the project from its conception. In the first year we piloted the project with our lead school and are now actively growing our SusNetwork both in terms of schools participation and the number of academic departments contributing units. What started out initially as a vision mainly for STEM subjects has grown to include nine academic departments (as diverse as International Politics and Theatre, Film and Television Studies) and involves key non-academic departments such as the Centre for Widening Participation and Social Inclusion, Schools and Colleges Liaison, and Information Services. During the coming year SusNet will have a portfolio of 12 modules and now have all schools in Ceredigion involved and have expanded the programme to interested schools in neighbouring Powys.

Keys to making it work

- **Aligning modules with the A-Level exam syllabus** (a reflective, iterative process with teachers and researchers to add value and extend the curriculum)

- **Introducing pupils to university-style research skills** (breaking down negative perceptions and barriers and building confidence)

- **Offering English and Welsh-medium courses** (learning is most effective when it takes place in the language of choice)

The final mark can be entered here and synchronised so that it appears in the Gradebook

The script can be annotated using 'Quick Marks' to highlight the parts of the text being commented upon

The marker can also create their own 'Quick Marks' so that these can be quickly added to particular types of assignment

Additional written or audio feedback can be added here by clicking on the 'speech bubble' icon
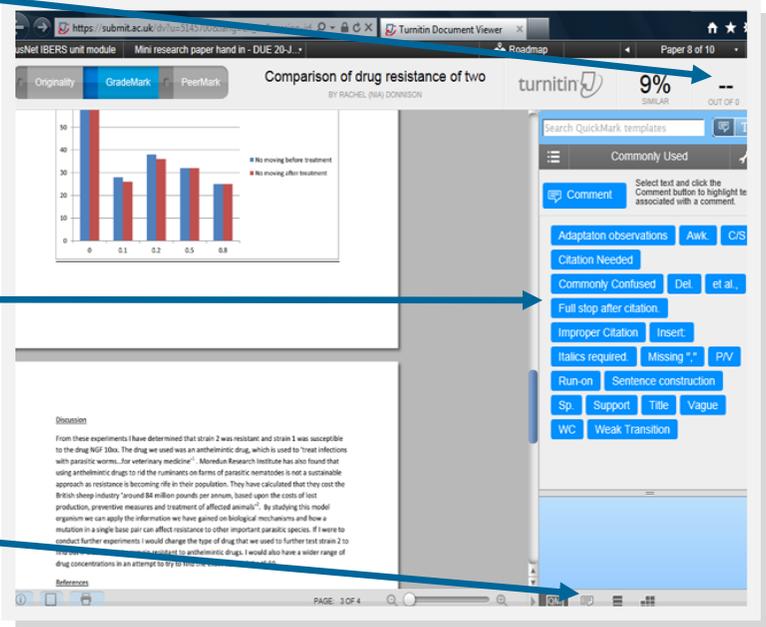

Figure 2: Screenshot showing an example submission in the Turnitin staff interface