



Information/Inspiration: a Web-based Sustainable Design Tool

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Introduction

This focus of this case study is on the development of a web-based sustainable design tool, known as 'Information/Inspiration', through collaboration between engCETL and Dr Vicky Lofthouse, an academic in Loughborough University's Department of Design and Technology. It was based upon a tool developed originally for use by practising industrial designers, which was then used with students in connection with their work on sustainable design – especially in connection with their design projects. These, and a wide range of other users, have adopted the version of the tool developed by this project.

Context

Dr Lofthouse, an academic from Design and Technology, had collected together a wealth of information and resources on 'ecodesign' as part of her PhD research, and had used them to create a simple HTML website – the first sustainable design tool to be developed to meet the specific requirements of designers. The tool combined design focused information with 'inspirational' case studies, which had been shown by her research to meet the needs of designers who were required to consider sustainability issues in their design projects. Once it became available to them, Information/Inspiration proved to be a useful resource for undergraduate students on programmes of study in Design and Technology including those in Year 1 in connection with their design projects; Year 2 or Year 3 in relation to an optional module on Sustainable Design; and Year 3 if they were doing a dissertation or design project involving issues of sustainability.

The aims of the Sustainable Design module are to enable students to become aware of the range of issues concerning sustainable development that could relate to designing and for them to develop an understanding of sustainable design they can employ in future projects. The teaching and learning strategies and the methods of assessment are in alignment with these intended learning outcomes. For example, in Semester 1, background issues are covered by means of lectures and seminars, while in Semester 2 a design project is undertaken – all research, analysis and design ideas being recorded in a logbook. Sustainable Design methods and tools are covered in lectures and tutorials; also workshops are held on website design – a student's final design proposals being displayed on a website. The prototype of 'Information/Inspiration' was used as an e-learning tool to support this teaching-learning process, particularly in relation to the students' design projects submitted in Semester 2 and worth 60% of the total assessment for the module.

Problems

The main problem, which the engCETL development project was asked to address, was to upgrade the web-based 'Information/Inspiration' tool. Despite the growth in its use, the original website was thought to have become 'dated' in terms of web technology, design and what it offered to the user. With regard to the content of the site, the academic responsible for its original development (Dr Lofthouse) was



finding it difficult to keep up with the task of continuously updating the tool. What was needed from engCETL therefore was input from an education technologist to produce a new design for the tool in order to enhance its usability, whilst at the same time making it easier for new materials to be added as and when they became available (i.e. to improve its sustainability).

Project aims

The main aim of the work undertaken by engCETL in collaboration with the proposer was to 'modernise' the original web-based 'ecodesign' tool for use in supporting those seeking to design and produce more environmentally and socially responsible products. The intention was that, as with the original tool, designers (working in a wide range of contexts including students in Higher Education) using the website would find it to be a useful source of information, which would help them with their ecodesign projects and examples of ecodesign from existing design projects to stimulate and inspire their thinking and creativity.

In addition, the intention was that the new design would make the up-keep of the website easier to manage in future, in terms of adding sustainable design case studies and new content.

Key dates

April 2005	Project proposal submitted by Dr Lofthouse
June 2005	Initial liaison with engCETL
July 2005	Development of website
October 2005	First use of website by students

Project actions

Education technologists from engCETL took responsibility for searching for open source content management systems software, which could be ‘tailored’ for use in the re-designed website. This was then installed on the server and customized, with Dr Lofthouse providing *“regular feedback on the progress of the project and the look and feel of the emerging design and the development of the website”* by commenting on *“visual mock-ups designed at engCETL”*.

Meanwhile, a research assistant from the Department of Design and Technology, Dr Debra Lilley, identified new sources of data relating to sustainable design, which could be placed on the website, located additional examples of design case studies; and dealt with such matters as checking the copyright of images. A number of *“training sessions”* provided by the educational technologists from engCETL enabled Dr Lofthouse and Dr Lilley to transfer content from the existing website and to add the new information to it along with additional sustainable design case studies. This not only helped to further the development of the tool, but also put in place the IT skills they would need if they were to manage its on-going maintenance and upgrading.

In terms of the project’s timescale, initial liaison between engCETL’s education technologist and Dr Lofthouse began in June 2005 and work on the design and development of the website started in July/August. The research assistant then worked on the task of adding content to the site during September, and the new version of ‘Information/Inspiration’ was ready for use by students in October 2005. Since then there has been ongoing liaison between with the educational technologist and the academic from time to time e.g. they have *“emailed each other when any unforeseen technical difficulties have arisen”*.

Project outcomes and impact

The version of ‘Information/Inspiration’ developed by the project has continued to be used as an e-learning resource by undergraduate students in Design and Technology especially those in Year 1 in relation to their design projects, Year 2 in connection with the optional *Sustainable Design* module and Year 3 by those doing design projects or dissertations involving sustainability. According to Dr Lofthouse *“it enhances the learning experience of these students because of the nature and the relevance of the information it provides”*.

In addition, because the content of the tool is generic in its application, it is also used by students at Loughborough University in disciplines other than Design and Technology (e.g. Civil Engineering), and by A-level students undertaking design projects as part of the Sustainable Design Awards programme run by Practical Action, which is an independent organisation founded in 1966 as the Intermediate Technology Development Group (ITDG).

Students on their Diploma in Professional Studies (DPS) placements are also extending the use of Information/Inspiration beyond the university to places where they were employed during their ‘sandwich

year', such as large industrial companies and small design consultancies. Dr Lofthouse summed this up as follows: *"many students use this resource while in their year out (in design practices etc) and introduce the resource to their industrial hosts. Because of the quality of the information it provides, many companies use it"*.

Finally, the tool is being disseminated via Design and Technology's departmental website and through the Sustainable Design Network (SDN). The latter has over 250 members including people working in industry, the public sector, charities, as well as graphic designers, and architects; 'Information/Inspiration' has been disseminated to them through the SDN website, and through presentations at SDN events.

One of the outcomes of the project for engCETL was that the Centre was able to trial a new method of implementing an off-the-shelf content management system, and this experience highlighted the ongoing issue of sustainability, with maintenance being a key concern in the introduction of electronic resources. This project has emphasised the ongoing need for a long-term commitment to supporting electronic resources that is distinct from the intellectual content of the resource itself.

Discussion

The primary task undertaken by the engCETL was to develop a web-based tool, which could be used to support and enhance students' learning experiences in relation to the study of sustainable design, and/or in connection with their design projects. What is of interest therefore, from a teaching and learning perspective, is the way in which the resultant resource ('Information/Inspiration') is delivered to and used by students in contexts such as these.

The first point to make is that with regard to the use of 'Information/Inspiration' in Design and Technology and other departments at Loughborough University, it was never regarded as a 'stand alone' resource – as a method of learning delivered entirely online. It was conceived and developed for use as an integral part of a teaching-learning-assessment strategy in which all of the components are aligned (Biggs, 1999) so as to facilitate the achievement of a wide range of learning outcomes. With regard to the latter, the intention is that students will develop an awareness of the issues relating to sustainable development, a knowledge and understanding of sustainable design strategies, the ability to undertake a sustainable design project and online communication skills. The methods used to achieve these outcomes reflect a conscious choice by those responsible for the design and delivery of the curriculum, of what they regard as the best and most appropriate means of promoting effective learning – in this case a combination of traditional and e-learning practices sometimes referred to as 'blended learning' (Australian National Training Authority, 2003; JISC, 2004). Therefore the students experience face-to-face lectures, workshops and tutorials complemented by opportunities to participate in online discussion groups, and to make use of 'Information/Inspiration', particularly in connection with the work they are required to do on their sustainable design projects. In line with the intended learning outcomes of the Sustainable Design module, it is assessed by means of a seminar presentation, an essay and an individual design project.

In linking teaching, learning and assessment in this way the students are being asked by their tutors to undertake what some writers refer to as an 'authentic learning task' (e.g. Trilling and Hood, 2001)

i.e. their sustainable design projects arise naturally out of the work the students have previously undertaken in their course, whilst at the same time closely matching the ones they are likely to encounter in future employment, either on their work placements, or after they have graduated. In effect, what they are being asked to do is to apply what they know and understand about sustainable development and the principles of sustainable design, to solving practical, real world design problems – to transfer what they have learned in one context to another. In so doing they are also being asked to change their identity i.e. to move from being ‘students’ of industrial design or engineering to becoming ‘designers’ or ‘engineers’. This is a situation in which students are thought to benefit from having access to a rich learning environment, which will support them whilst they undertake coursework in the form of challenging ‘authentic tasks’ and negotiate difficult personal transitions. According to social constructivist theories of learning, individuals who find themselves in situations such as these are operating in what Vygotsky (1973) termed the ‘Zone of Proximal Development’ (ZPD) – the ‘gap’, which separates what they already know, understand and can do, from the new levels of capability they are seeking to achieve. This bears many similarities with the idea of the ‘portal’ from ‘threshold concept theory’ (Land, Meyer and Smith, 2008) through which students must pass in order to achieve important new understanding and develop new skills. According to this theory, learners will in all likelihood find such transitions ‘troublesome’, but at the same time ‘transforming’.

What the students need in these circumstances, is a learning environment in which they have access to various forms of support to enhance their learning, and in so doing help them to achieve new levels of knowledge and understanding, acquire new skills and take on new identities – as Cousins (2008) argues, learning “*changes who we are as much as it changes what we know*”. ‘Information/Inspiration’ was planned and developed specifically for use in this context i.e. to support the students’ learning experiences by providing them with a web-based resource customised to meet their needs. It offers them a library of designs to help stimulate their creative thinking, and a rich database from which they can access the information they need to inform their decision-making. This is the niche, which *Information/Inspiration* was intended to occupy in the learning support system available to students along with personal tutorials and online discussion groups. The latter facilitate collaboration in the form of social interaction with a network of fellow students with whom they can discuss issues relating to their sustainable design projects – in effect to function as a virtual ‘community of practice’ (Lave and Wenger, 1991; Wenger, 1998).

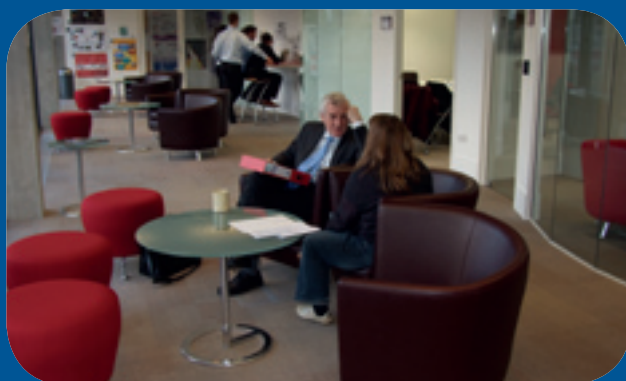
Finally, it should be noted that the use of e-technology to support student learning in the ways described in this case study conforms to the guidance offered by Barker (2004) on the basis of the EASEIT-Eng evaluations i.e. “*technology-based resources must be integrated into the course so that they seem too the student to be as natural a part of the course as lectures, tutorials and lab classes*”.

Conclusions

This project has succeeded in developing a robust and highly usable web-based tool for use in supporting students' learning experiences in relation to the study of sustainable design – especially when undertaking 'authentic learning tasks' in the form of design projects. The key to the success of the project was the close collaboration between academic staff from Design and Technology and learning technologists from engCETL, and the active promotion of the resultant tool both within the university and beyond. It is not surprising therefore, that 'Information/Inspiration' is now widely used – not just in a number of subject departments at Loughborough, but also beyond, in a wide range of contexts where sustainable design is a matter for serious consideration.

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