

EMBEDDING ECODESIGN AND SUSTAINABILITY IN MAINSTREAM DESIGN EDUCATION: INSIGHTS FROM WALES

Simon O'RAFFERTY, Hannah CURTIS and Dr Frank O'CONNOR

Ecodesign Centre Wales, Cardiff, UK

ABSTRACT

The UK sustainable development action plan emphasises the need to have 'sustainable literacy' as a core competency of professional graduates. The Welsh Assembly Government, as a devolved administration in the UK, has also pursued the sustainable development agenda. The Welsh Assembly Government has a statutory obligation to promote sustainable development in the exercise of its functions. This can be seen in a number of strategy documents, not least, the strategy for Education for Sustainable Development and Global Citizenship, [1].

In 2006, Ecodesign Centre Wales (EDC) was established to build capacity and capabilities in industry, public sector organisations and Higher Education so that ecodesign can happen in Welsh industry. EDC is taking an innovative approach by working in partnership with the course leaders from the four universities in Wales that offer product design degrees. The collective aim is to provide a platform for the sharing of skills and knowledge with a view to mainstreaming ecodesign and sustainability issues within existing curricula. This paper outlines some of the practical experiences encountered to date.

Keywords: Higher Education, Capacity building, Ecodesign, Intra-university

1 INTRODUCTION

Designers, in the broadest sense, have an important role to play in the transitioning to sustainable systems of consumption and production and a low-carbon economy. Sustainable Development (SD), as a pervasive principle in policy making, contains many perspectives and agendas. These different perspectives place varying levels of emphasis on the environmental, social and economic impacts of human development. Because SD is a complex global issue with tangible local implications it is as challenging as it is engaging.

Many businesses are looking to address sustainability through design and business communications. Because of this, the skills and knowledge that professional designers require, when addressing these sustainability issues, are increasingly trans-disciplinary and diverse. These skills need to be embedded into education and training systems.

For the purpose of clarity, we define ecodesign as a strategic design management process that is concerned with minimising full life-cycle impacts of products and services (e.g. energy, materials, distribution, packaging, end-of-life treatment, health, usability). Although it is primarily focused on product and process improvements, ecodesign considers the social and economic impacts of products and services.

2 EMBEDDING IN MAINSTREAM CURRICULA

Much of the debate on ecodesign education has centred on whether to embed the topics within mainstream curricula or to offer separate modules. The debate draws on conflicts over what constitutes good design education, the role of higher education in society, the potential politicisation of students and existing skills competencies within universities.

Students and educators may feel uncomfortable, at least initially, when dealing with aspects of sustainability that require them to cross normal discipline boundaries. Research from the UK Design Council supported this and found that design educators admit to being challenged by the broad skill set needed to practice more sustainable product design. They identified over 30 different skills ranging from facilitation and people centred skills to knowledge of manufacturing techniques, materials and environmental impacts [2]. This is an immense challenge.

The UK Higher Education Academy acknowledges the research revealed four major barriers to the successful embedding of SD into many of the subject disciplines in HE [3].

1. Overcrowded curriculum.
2. Perceived irrelevance by academic staff.
3. Limited staff awareness and expertise.
4. Limited institutional drive and commitment.

Lozano believes that even though SD is a radical innovation within universities, it is necessary to incorporate it incrementally to avoid resistance and unnecessary conflict. While incorporating SD Lozano states that: “Small groups of people should begin and, if successful, build up (SD) momentum throughout the entire university” and that the relationship between changes in behaviour and changes in belief will require careful consideration and support. [4].

3 EXISTING ECODESIGN RESOURCES

There is a long tradition of sustainable and ecodesign education with a number of leading international universities offering undergraduate modules and post-graduate courses in ecodesign. Within the UK, the HEFCE has stressed that embedding sustainability in mainstream curricula needs to be supported by the development of “credible teaching materials which are fully contextualised and relevant” [3].

There have been a number of ecodesign and sustainable design education resources developed by various practitioners both internationally and in the UK. Many of these resources have been developed from within a university context with support from external agencies. Table 1, while not an exhaustive list, highlights some of these resources from the US, UK and Australia. They have been applied in many contexts and to varying degrees cover the main topics in ecodesign and sustainable development.

These resources have been very well received and have been critical in raising the awareness about the education knowledge gap. Unfortunately there does not appear to be any broad comparative evaluation on the effectiveness of these resources and the impact they have on design graduates. There is also little data on the long-term application of these resources across institutions or disciplines primarily due to lack of funding. It is not within the scope of this paper to provide such an analysis but as evaluation studies arise from the activities in Wales there will be opportunities for further research.

Table 1 Overview of ecodesign and sustainable design teaching resources

Resource	Organisation(s)	Target audience	Learning Style	Resource
DEMI - The Design for the Environment Multimedia Implementation Project offline	Goldsmiths College, University of London (lead institution).	HE students	Holist	Web (offline)
OKALA Ecodesign Guide	Industrial Designers Society of America	HE students	Serialist	CD, web
Toolbox for Sustainable Design education	Loughborough University	HE students	Serialist	CD
Information/Inspiration	Vicky Lofthouse, Loughborough University	Professionals	Serialist	CD, web
DOTT ecodesign challenge	UK Design Council	Primary students	Action	Web
The Sustainable Design Award	Practical Action	Secondary students	Serialist	Paper, web
WEEEMan	Royal Society for the Encouragement of Arts, Manufacturers and Commerce	Secondary students	Serialist	Web
National eco-design curriculum development	RMIT University	HE students	Serialist	CD

4 CAPACITY BUILDING FOR ECODESIGN EDUCATION

As mentioned above there are significant organisational and process barriers to the embedding of sustainability in existing curricula. It is worth questioning the perceived irrelevance, limited awareness and expertise of academic staff when there are so many resources available. There is obviously an implementation gap. EDC believe that there is a need for more capacity building with staff in universities to facilitate the embedding of ecodesign in the curriculum.

Capacity building is concerned with enhancing critical-reflection, awareness and skills to change behaviour. The principle of capacity building understands that having the right information and skill does not automatically contribute to action. Samuel contests that to enhance the capacity of an individual, institution or community it is necessary to integrate four different but connected aspects. These four elements are Perspective, Information, Skills and Modes/Systems. Perspective helps to locate individuals and institutions in relation to the macro picture and the confusing realities [5]. This principle is clearly important when embedding sustainability in design education.

5 ECODESIGN CENTRE WALES RESOURCES

EDC have approached the embedding of ecodesign and sustainability in mainstream design curricula through a combination of tailored teaching resources, “trainer training” and student support. EDC have firstly created a platform for course leaders from product design education in Wales to discuss SD issues and secondly co-developed

teaching resources to reflect different university needs. This process has allowed both the lecturers and EDC to build upon existing knowledge and refine activities.

To reflect the interdisciplinary nature of sustainable development the EDC teaching resources draw information from a range of other disciplines, such as ecology, social science and communication design. The resources are primarily composed of text, images and graphics (discussion starters), key quotes, industry supported case studies, videos and web-links. Each slide is supported by notes for tutors and students. There are also a number of suggested studio based activities and exercises. The slides and exercises are based around key learning areas but they are flexible enough to allow individualisation by each university. The topics covered include sustainable development, emerging drivers of innovation, lifecycle thinking, ecodesign, tools, strategies, communication, branding, and environmental product policy.

The resources are structured in a way to allow for “deep learning” over an extended period, such as three years. According to Warburton “Deep learning involves paying attention to underlying meaning. It is associated with the use of analytic skills, cross-referencing, imaginative reconstruction and independent thinking.” [6]. The resources allow for a combination of comprehension (holist) and serialist learning. As the students move beyond the foundational concepts of sustainability and innovation the resources reflect a staged design process. It is hoped that this process will build upon and confirm previous learning.

6 MONITORING AND EVALUATION

Although it is important, evaluating the effectiveness of the staff-oriented capacity building activities on design students has inherent difficulties. Some of these difficulties include time lag between the activities and when the student becomes a professional designer, attributing the impacts of teaching activities to design capacity and the quantification of qualitative effects of teaching. These qualitative effects include new perspectives, social capital and new competencies. EDC have suggested adopting the evaluation framework as suggested by the Higher Education Funding Council (Table 2). This system is suitably broad to try to accommodate individual university monitoring and evaluating systems. EDC did not deem it appropriate to burden the course leaders with both new ecodesign skills and a new monitoring system.

Table 2 Higher Education Funding Council evaluation framework

level	1. awareness	2. knowledge	3. embedding
description	the ability to describe, in their own words, the meaning of SD and its relevance to design.	the ability to carry out a simple qualitative life cycle assessment of a product or service.	incorporating SD and ecodesign aspects into all design projects
assessment	essay/case study presentation	project	portfolio

Techniques to track progress are still under development with each university but approaches include observation, interviewing and video recording of lectures.

7 OBSERVATIONS

Through the course of working with the universities there have been a number of key observations that have informed EDC activities. These observations reflect the practical experiences in embedding ecodesign and sustainability in mainstream curricula, creating platforms for the sharing of knowledge and facilitating ownership.

7.1 Institutional drivers

There are many perceived drivers for embedding ecodesign and sustainability in mainstream design curricula. Some of the drivers cited by the course leaders in Wales include course differentiation, maintaining relevancy of curriculum, contemporary subjects, international competition, third mission and personal well being.

7.2 Perceptions of sustainability

One of the issues explored during the first round of training sessions was the differing perspectives of sustainable development amongst the university staff. These perceptions were largely oriented towards the conservation and harm-reduction elements of sustainability e.g. carbon reduction, recycling and labour rights. It was noted that the course curriculum and the course strategy seemed to reflect, or influence, the responses given e.g. “Emotional bonds and respect” (human centred approach) “Reusable materials, products and power sources” (technologically driven curriculum).

7.3 Intra-university collaboration

Creating platforms to share knowledge across the institutions has been a crucial element of capacity building activities. The appropriate levels of trust and support need to be fostered and the platforms for this to happen need to be flexible. When this is achieved the universities are open to sharing experiences and knowledge on embedding ecodesign. EDC believe that the creation of an independent body was essential to engaging the four universities of Wales and facilitating their collaboration.

7.4 Information hierarchies

The perceived risk of stifling creativity has been raised by staff on several occasions. The prescriptive and managerial models of ecodesign can be seen to overshadow the largely intuitive processes of creativity. There is a dynamic balance between establishing context and nurturing perspectives on sustainability in students. The gradual revealing of context and information is a potential strategy but the experience and sensitivity that the educators bring will be invaluable in trying to resolve this issue.

7.5 Continued professional development

Lecturers need to be competent with the subject matter to adapt and repackage the resource to reflect their needs. A number of the staff cited Continued Professional Development as a key tool to help them explore the resources in more depth. There are opportunities to explore how capacity building within the training and development units of the universities can facilitate this.

8 DISCUSSION AND CONCLUSIONS

This paper sought to briefly highlight some of the key practical experiences of embedding ecodesign in mainstream design curricula. The initial phase of this work has put foundations in place for longer term intra-university collaboration. To maintain the

relevance of the resources it will be important to facilitate ownership and encourage continuous development.

There are a number of difficulties in designing evaluation frameworks for the resources. This is due to different institutional competencies, culture and assessment criteria. Taking the project forward there is potential to explore innovative ways to provide co-operative platforms to enable knowledge sharing.

Making the resources relevant, engaging and adaptable (while orientated towards industry and policy) is challenging. Our experience to date has shown that a long term perspective is required and that there is no “silver bullet” approach. Therefore EDC emphasise the need to undertake longitudinal studies to explore the impacts over time.

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Simon O'RAFFERTY
UWIC
Ecodesign Centre Wales
Sophia House
28 Cathedral Road
Cardiff
CF11 9LJ
simon@edcw.org
+44(0)29 2066 0147

Hannah CURTIS
UWIC
Ecodesign Centre Wales
Sophia House
28 Cathedral Road
Cardiff
CF11 9LJ
hannah@edcw.org
+44(0)29 2066 0147