An Educational Framework for Future Designers

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The Circular Economy and ESD

The Circular Economy is widely recognised in Higher Education as being the alternative to the linear economy model. In contrast to the linear economy model, the Circular Economy is predominantly taught through piecemeal projects, rather than being embedded throughout university undergraduate degree programmes. Applied Design disciplines are inherently experiential and require students to engage with process led, tangible projects that accumulate towards a portfolio of graduate skills and attributes. The Circular Economy requires students to be more than conversant with a discipline specific, linear process led education. Our future designers, in a 'characterisation of the linear and circular economies' described by Lovins et al (2013), must learn to think systemically; design products to be recovered after lease; encourage repair, recovery and reuse to reduce waste streams, as well as empathise and engage with regional and local communities: continually being critical and creative when considering the impact of design and systems upon people, the economy and the environment.

The United Nations Decade of Education for Sustainable Development (DESD, 2005-2014) is a global movement that aims to transform education policy, investment and practice. Their goal is to 'engage people and communities in meaningful lifelong learning processes' exploring how societies can live in more sustainable ways, Tilbury and Cooke (2005). In an international review of national and regional Education for Sustainable Development (ESD) strategies Tilbury (2011) concluded that participatory and active learning approaches are perceived as most appropriate to learning for sustainable development.

Tilbury (2011) defined five key pedagogical principles to engage young people in Sustainable Development. These key principles have been employed, by the authors, to assess the quality and impact of the student experience throughout the degree programmes, as discussed by Ryan and Tilsbury (2013), of four applied design disciplines at the University of Gloucestershire i.e. Product Design, Interior Design, Fashion Design and Landscape Architecture. This longitudinal study, initiated September 2015, has led to the development of a framework that employs the ESD key principles in combination with the Circular Economy model, with the aim of engaging educators and students with the Circular Economy. The intention is for this framework to be embedded into the whole of the degree programme and to map out assignments that involve participation, an active learning approach and collaboration with diverse stakeholders. This paper will describe a case study that has employed this framework to engage students with facets of the Circular Economy, in particular 'repair and reuse' in collaboration with diverse stakeholders from the local community.

The frame work

This framework is based upon five components of assessment, reflected in the IUCN publication prepared by Tilbury (2011) which are: Futures Thinking, Critical and Creative Thinking, Participation and Participatory learning, Systematic Thinking and Partnerships and are summarised as follows:

'Futures thinking engages people in imagining preferred visions for the future. It involves the exploration of assumptions and of meaningful understandings and interpretations of sustainable

development. This process of envisioning futures leads people to take ownership and responsibility for more sustainable futures'.

'Critical and creative thinking enables people to explore new ways of thinking and acting, make informed decisions, and create alternatives to present choices. It involves reflecting on how people interrelate with one other, understanding cultural differences and creating alternative ways to live together'.

'Systemic Thinking is essential to sustainable development, as piecemeal approaches have proved not to work - instead resolving one issue while creating other problems. Sustainable development requires approaches which go beyond analysis in terms of 'problem-solving' and/or 'cause-effect'.

'Participation and Participatory Learning involves the engagement of people needed to build sustainable futures collectively. Engaging diverse stakeholders and communities is essential, as they value and include differing knowledge systems and perspectives. The process of participation is also important for creating ownership and empowerment'.

'*Partnerships* are a motivating force towards change. They empower people and groups to take action, to take part in decision-making processes and to build capacity for sustainable development. Intercultural and multi-sectoral partnerships in particular are often highlighted as critical in EDS approaches'.

The intension of this framework, shown in figure 1, is to create and assess participatory and active learning approaches that engage students with facets of the Circular Economy throughout their undergraduate Higher Educational programme. The authors have also assessed the empowerment of students by questioning how students feel about influencing the future for sustainability. The focus of this case study was to create active participation and engage students with partnerships but also with the intension of enabling systemic, future, critical and creative thinking, with the outcome of empowering participants while engaging in repair and reuse.

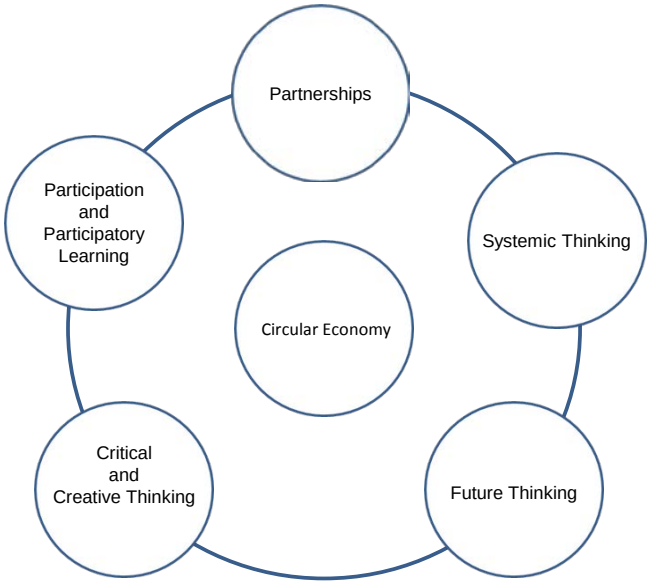

Figure 1. The Framework

The Case study

This longitudinal study was initiated through the collaboration of four design disciplines, i.e. Product, Fashion, Interior Design and Landscape Architecture during the first year of undergraduate study. It has instigated emerging projects and collaborations created by each course leader, which has been recognised and shortlisted for the Green Gown Finalist Award (2016) in the 'Learning and skills' category. This paper focuses, in particular, upon one of the projects that engaged students in the Circular Economy system of Repair, Maintenance and Reuse, while involving the ESD principles of Partnerships and Participation with an active learning approach as suggested by Tilbury (2011). This collaborative project involved course leaders, first and second year Product Design, first year Fashion Design and final year Graphic Design degree students from the University of Gloucestershire. It also involved the collaboration of 'Vision 21' (2016), a local sustainability focused charity that supports the resale of used furniture and community engaged sustainable projects and supported by the Gloucestershire County Council Joint Waste Team (2016), that manage the recycling and disposal of waste throughout Gloucestershire.

Repair Cafes are a global phenomenon initially pioneered in Amsterdam and are emerging globally and throughout the United Kingdom, see Repair Café (2016). They have instigated collaborations with the local community and in some cases collaborations with Higher Education Institutions, with the support from Town Councils, see CFSD (2016) and Charter and Keiller (2014). The aim of this project branded as 'Regeneration' was to create a community venture to partly support the launch of a new Repair Café in Cheltenham. Where people from the local community bring products: such as furniture, bicycles, electrical items, as well as clothes, to be repaired by voluntary electricians, engineers and seamstresses, in a café environment. The intension of launching the Repair Café was for the students to gain first-hand practical experience of how to engage with diverse stakeholders, carry out primary and secondary research on the local community's attitudes towards repair and for Product Design students to gain knowledge about a diverse range of products and their faults, to suggest possible alternative solutions. Also critically assess and suggest alternative designs for ease of disassembly and assembly for repair and maintenance.

Prior to the launch of this project the second year Product Design degree students were provided with an assignment, to undertake primary and secondary research to support the opening of a Repair Café in Cheltenham in May 2016 and report on how they could engage the community, in particular young people and women to repair, Rosner (2012), Parker et al (2012) and Scott and Weaver (2014). They liaised with the first year Product Design students, and the stakeholders involved, i.e. the local sustainable charity 'Vision 21', the Gloucestershire County Council Waste Team and the general public through questionnaires and interviews. The second year students initially visited the Malvern Repair Café which has been in existence for four years and the launch of a new Repair Café in Stonehouse, see BBC Hugh's War on Waste (2016). The organisers of these events were concerned that the ratio of students did not outweigh the general public, thus it was decided to create a 'Mock' Repair Café where first and second year Product Design students brought their own products to repair.

The first year Product Design students were required, as part of their assessment for a 'Materials and Manufacturing' module to research the community's, especially women and young people, attitudes towards repair, Salvia (2015). It is also part of the learning outcome of this module to deconstruct and analyse the materials and processes employed for products. The choice of product was limited to the products brought for repair during the mock Repair Café, due to the uncertainty of the launch date of the community Repair Café. Initially, each student was divided into groups and provided with a kettle and an electric domestic iron, then requested to deconstruct, hand sketch, analyse the material selection and the ease or difficulty in disassembly and conversely assembly, before reporting on how they would suggest a redesign for ease of repair.

The branding for the launch of this project, influenced by 'engineering blue prints', as shown in Figure 2, was created by two Final year Graphic Design degree students, as part of a final year assignment. This branding is used for all promotional posters, leaflets, social media and banners outside the Repair Café venue. The outcome of regular project meetings (involving all the stakeholders) evolved into a new 'Regeneration' ethos, which is an adaptation of the Repair Café concept to incorporate other facets of the circular economy, such as reuse and become a spring board for other projects

created by the design course leaders. The launch of the Regeneration Café in May 2016, for example, also incorporated ‘reuse’ as a theme through ‘upcycling’ denim demonstrations and an exhibition, created by the first year Fashion Design students and the Fashion Course Leader. During the launch first and second year Product Design students sat with repairers, trained electricians and a Gloucestershire University Product Design Technician, to observe and help repair products brought in by the general public. They were also required to give radio interviews and undertook primary research through interviews and questionnaires of the general public in Cheltenham, prior to the launch and voluntary undertook interviews of those who participated on the day.

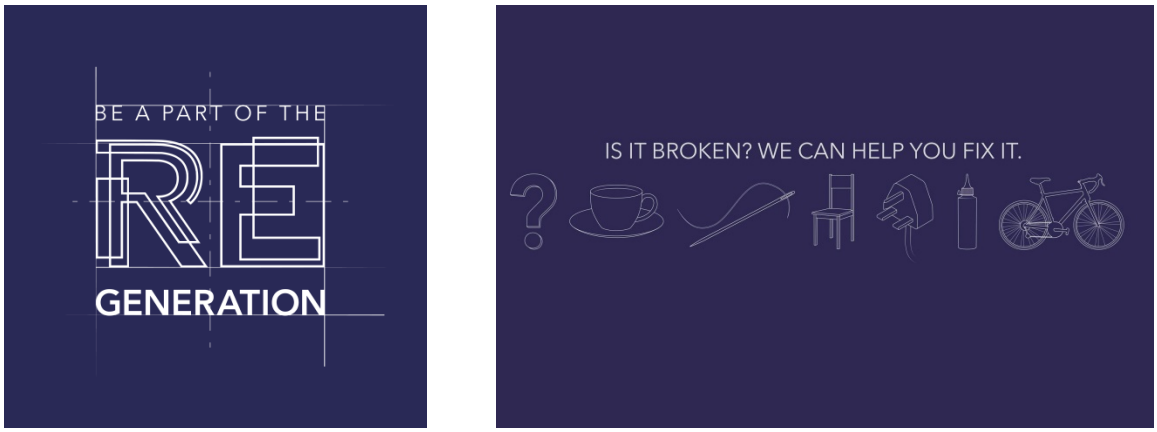

Figure 2. Branding created by final year graphics students

Conclusion

The feedback from the initial longitudinal assessment indicated that the first year design students, involved in the ‘Regeneration’ project, felt empowered through their involvement in the development and ultimate launch. They ‘enjoyed observing the general public being involved with repair’ and felt that they were ‘able to make a positive change for the future’. They also reported that they ‘enjoyed learning about primary and secondary research undertaken for this project’. Their suggestions for improvements were that would like more ‘live’ projects, were looking forward to collaborations with new disciplines, even though this was one of two collaborative projects. The other collaboration being with Interior Design and Landscape Architecture students and Course Leaders to redesign the furniture and interior of the University of Gloucestershire Hardwick Art and Design entrance and gallery, during their first year. The students also reported that they were looking forward to being further ‘involved and seeing the future outcome of the Regeneration project’.

The success of this project, from the feedback of the first year Product Design students, was the embedding of this Regeneration project into their assignment, i.e. Materials and Manufacturing. It was extremely practical with a ‘real life’ outcome. The Circular Economy model was taught holistically within the context of material recovery and hence the need to design for repair was naturally accepted and understood.

The Lessons learnt from this project were that the stakeholders need to be fully committed and comprehend the scope of the project, prior to the initiation of the student’s assignment. Otherwise the risk of effecting student’s expectations and confidence could create a negative effect upon the project and the learning outcomes. It is also important that the repairs understand that they need to share their product knowledge with the students and the public to empower rather than exclude.

Timing, of the organisation and agreement to participate in this type of collaborative project, is imperative, which is always a challenge for the launch of new assignments in line with the new academic year. Preparatory time needs to be given for discussions, to scope out the limitations and expected outcomes of all participants and their organisations.

The location of this type of project needs be considered for insurance purposes. This project was launched in a church hall, rather than on university premises, to attract the local community in collaboration with Vision 21, thus negated this issue. A declaration of the guidelines of repair is required to be read and signed by all attendees to the Repair Cafe. Questionnaires were attached to the back of this declaration to gain further information, including attitudes of the consumer, including the products and their faults. This confidential information is employed for monitoring of people and products by collaborators and will be used for future research, such as practical sustainability impacts that support council waste targets e.g. 83 items repaired and not sent to landfill since launch.

Promotion through the University, social media, local radio and newspapers was important to raise awareness of this event. The launch was attended by the Design students, Course Leaders, the Director of Sustainability from the University of Gloucestershire, the Co-ordinator of the RCE Severn, Vision 21 and Gloucestershire County Council, a local MP and environmentalist Jonathon Porritt.

Scalability also needs to be considered if large numbers of students are to support and engage with community projects. A rota system could be introduced and the length of the project be extend to account for this. The 'Mock' Repair Café was extremely successful in distilling this concept with all of the participants present, including the students. It also gave the students time to develop their confidence and product knowledge in a supportive environment.

Finally, the outcome of this project was that the students were able to engage with the Circular Economy through application of the Education for Sustainable Development (ESD) principles. They were able to participate and create partnerships with interdisciplinary and diverse stake holders. They were able to think critically through their primary and secondary research to create the Regeneration launch. To think systemically through their practical and first hand experiences of the Circular Economy by redesigning for repair for consumer independence and/or recovery; and to create a future where they feel empowered through their active participation and partnerships with other design disciplines, the local charity Vision 21, the Gloucestershire County Council and the community.

Emerging Projects

New collaborations have developed themed monthly events based on reuse and repair, alongside the Repair Café ethos. The University of Gloucestershire provides a RCE Severn platform (2016), to facilitate collaboration, skill sharing, learning and knowledge exchange for sustainability across the region. The RCE Severn partners consist of 100 organisations from a wide range of sectors including education, business, public sector and non-governmental organisations from the West Midlands and South West of England. One of these partners, IT Schools Africa (2016), is a charity that supports the creation of IT classrooms in Africa, through the reuse and export of computers donated by businesses and schools in Britain. They are providing a 'guest drop in' session, alongside the usual Repair Café monthly event, for the local community to bring their electronic devices and computers for advice and repair. It is the intension to develop further collaborations with other organisations partnered with the RCE Severn.

A 'clothes swap' is also being organised, as another 'one off' theme of the Regeneration Project, with the support of the 'Love your Clothes' (2016) campaign, where the local community exchange their pre-loved clothes. Themed 'guest' collaboration is organised with the Fashion Course Leader, at the University of Gloucestershire, who has also instigated 'Thread Counts'. Thread Counts is a fashion and textiles forum for sustainable and creative futures, which aims to increase awareness of slow ethical textiles and sustainable fashion while promoting it to a wider public audience regionally and contribute to developing a pedagogic framework for e-learning, research as practice and impact specifically around ESD.

Future projects based on this framework are also being created. The Cheltenham Design Academy (2016) that provide voluntary workshops for secondary school children throughout Gloucestershire to

experience and explore creative design subjects, will be provided with a workshop based on the product ‘longevity’ facet of the Circular Economy, with the support of the Product Design students from the University of Gloucestershire. The University of Gloucestershire Sustainability team has also recently launched a ‘LIFT’ (2016) grant scheme that supports sustainable business enterprise for undergraduate students. Whereby design students will focus on the ESD and the circular economy ethos, as part of their ‘Commercial Entrepreneurship’ module and pitch their innovative concept designs to apply for this development grant. Course leaders from all the applied design subjects, now including the ‘education’ department, will continue to exchange lecturers and create collaborative projects, with local community and organisations with sustainable interests.

The intention of this framework is to further develop collaborations and employ the ‘Regeneration’ and emerging projects described, as a platform to create tangible experiences for our future designers, based upon the Circular Economy model. These projects will be embedded throughout the design degree programmes, assessing the impact of projects that support active participation and ultimately support collaboration with the community, charities, organisations such as ‘Hackerspace’ (2016) and ‘MakerSpace’ (2016), educational establishments, local and regional businesses, while encouraging enterprise start-ups. The prime aim of this framework is to collaboratively explore sustainable practices, with particular regard to the Circular Economy, through the engagement of pedagogical principles of Education for Sustainable Development.

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