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Building and the Art of Resilience

Education for Sustainable Development in Construction Education

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Abstract

This article starts with a review of policy documents and academic papers that demonstrate clearly the need to re-orientate the education system in order to advance society towards developing sustainably. It goes on to define Education for Sustainable Development (ESD) and shows the role it has to play in building resilience in students and communities in order to meet the challenges ahead. The article then considers the implementation of ESD and the barriers to it, before looking at what this will mean for the construction education sector, how it has to change and how ESD principles can facilitate this change.

1 INTRODUCTION

You can't solve problems with the same thinking that created those problems.
Albert Einstein

When one considers that the present education system may be having quite a detrimental effect on the environment, a paradigm shift is of the utmost importance. Currently we are being educated to 'compete and consume' rather than 'care and conserve' (Mc Nerney and Deakin 1996). Indeed, most educational theory and practice still supports unsustainable practices. A UNESCO report (2002) notes that a 'new vision' and a deeper way of thinking about education is needed because the current education system falls short of what is required to bring about a sustainable future.

The UN World Summit in Johannesburg (2002) outlines the need for a reorientation of our education system and for integrating sustainability into education. This objective was restated at the United Nations Conference on Sustainable Development in 2012. There have been calls from numerous governmental, non-governmental bodies and academics for a reorientation of education in the US and the UK, while studies are showing that students want more and more to work with ethical employers and that employers are turning to universities to prepare students for a more socially responsible role (van Nierop, 2008).

The UK's new Sustainable Development strategy; *Securing the Future: Delivering UK Sustainable Development Strategy (2005)* places emphasis on the education system's role in both raising awareness about Sustainable Development and teaching the skills needed to implement

sustainable practices. The document also states that the traditional information provision approach is unable to take into account the entire social, political and institutional factors which form attitudes and behaviours. It argues that 'sustainable development principles must lie at the core of the education system such that schools, colleges, and universities become showcases of sustainable development among the communities they serve'. It places a priority on the development of sustainability literacy as a 'core competency' among graduates.

In the US the Green Building Council has argued that all students across all faculties should learn about sustainable building as its knowledge and understanding is crucial in dealing with sustainability issues, the theory being that you create a discerning citizenry who will request sustainable product and methodologies thus forcing companies to provide them.

Furthermore, there is consensus in the literature among academics and educators that the education system is key to the process of driving the change necessary for a sustainable society (Applied Research and Public Policy, 1999). A cultural-shift in the way we see education and learning, based on a more ecological or relational view of the world is needed. This is highlighted as necessary over a piecemeal, bolt-on response which leaves the mainstream otherwise untouched.

Hopkins and Mc Keown (1999) are unambiguous about the fact that 'our current path' will not bring about transition to a sustainable society and that therefore we must take another approach using education. They also say that the desired outcomes of this new education process would be radically different to what we now experience, consequently, the teaching methodologies used in achieving these outcomes must also be reconsidered.

Reorienting education will give people skills to make lifestyle changes and will enable a society to become more sustainable. Hopkins and Mc Keown (1999) say it is about teaching people not only skills and knowledge but also perspectives and values which will allow them to live sustainably. This entails systemic change in thinking and practice, informed by what can be called ecological thinking and values.

Sterling (1996) agrees that education is the key to change. He says it has to be at the centre of the task both as 'subject and agent' i.e. not only is the content important but the methodology also. Sterling (1999), citing his long experience of thirty years involvement in environmental and sustainable education, says he has come to the conclusion about the need for a complete overhaul of the education system, or as he says, a paradigm shift is needed to change how we view the world in order to embed an environmental ethos. Further research bears this out with some researchers believing that knowledge alone is not adequate to produce a change in behaviour. In other words, knowledge alone does not provide citizens with the skills needed to transition to a sustainable society (Clifton, Mauney and Falkner 1998).

2 EDUCATION FOR SUSTAINABLE DEVELOPMENT

2.1 Genesis

Education for Sustainable Development is an amalgam of Development Education (DE) - which has grown out of work on the ground in developing countries and is primarily concerned with social justice issues, such as food, water, fuel sovereignty and poverty -and Environmental Education (EE) which is concerned with protecting the environment.
The methodologies and content matter of DE/EE and ESD are closely aligned and include the concept of education as a tool of empowerment, inspiring individuals to assume sustainable lifestyles for the benefit of present and future generations. The coming together of these two ideologies creates a complex but more realistic approach to problems which are clearly intertwined in Sustainable Development.

The aim of ESD is to build resilience by changing attitudes and associated behaviour through an education process which produces ecologically literate, socially conscious, technically / practically skilled problem solvers.

1. ***Overview***

In 2007 UNESCO defined ESD as a practice which:

a) promotes a shift in mental models
b) engages formal, non-formal and informal education
c) promotes lifelong learning
d) uses a variety of techniques that promote participatory learning and critical reflective skills
e) promotes social justice
f) accommodates the evolving nature of sustainability
g) is locally relevant and culturally appropriate
h) is based on local needs, perceptions and conditions which acknowledge that fulfilling local needs has global consequences builds civic capacity for community based decision making.

Education for Sustainable Development (ESD) differs from traditional teaching methodologies in that it uses a whole-school, multi-disciplinary approach, with curriculum developed in conjunction with and by the students and based on the needs of the region/community within which the learning centre is based. Hopkins and Mc Keown, (1999) and Huckle (1999) are in agreement with this, suggesting that communities and educational systems need to work together towards a sustainable outcome with the Community setting sustainability goals and the education system modifying its curriculum to underpin support and reinforce these goals. ESD demonstrates skills, values, knowledge and understanding that support positive action toward sustainable management of the environment and greater social equity and poverty eradication (Centre for Global Education Policy, 2008). ESD takes a holistic approach to our

global concerns and seeks to solve problems taking into account social, economic and environmental considerations.

The overriding aim of ESD is to develop resilience in the individual and the community to meet the challenges of global warming and peak oil. Teaching resilience is best achieved by equipping individuals and communities with problem-solving capabilities. This is deemed achievable through raising awareness of global justice issues and enhancing eco-literacy skills; developing interpersonal skills and thinking skills.

Eco-literacy skills allow us to understand environmental systems and the interconnectedness between man and nature. Interpersonal skills, developed through team work and transdisciplinary collaboration, allow us to communicate our concerns and ideas effectively. While critical thinking and whole-systems thinking, vital approaches to problem solving, are developed through engaging in holistic analysis, generation, assessment and implementation of relevant knowledge, to solve real problems.

2.3 Methodology

Key to Education for Sustainability is the actual process of learning ie. how we learn, not just what we learn. Sterling (2001) suggests that the curriculums goals, aims, knowledge, methods and assessment are developed by the learner, based in part on personal knowledge. This involves developing a curriculum that recognises that knowledge is provisional and approximate, involves the learner in determining goals and methods, allows for negotiation and flexibility, and promotes local, personal, applied, and first-hand knowledge. The emphasis here is on knowledge that is applicable, practical, inclusive, and self-critical. Evaluation is based on self-evaluation, self-generated indicators, critical feedback and support from others, and assessment that is qualitative as well as quantitative.

Education for Sustainable Development requires a holistic, participatory, solution- focussed approach (Sterling, 2001). Learning through experience, participation and reflection is known a Transformative Education and asks the learner to take responsibility for real issues. Learners are to be encouraged to take their knowledge out into the real world and engage with real issues that impact on our society and other human beings (Mezirow, 1991). Thus, traditional methods of education, based on compartmentalisation of subjects, needs to be dismantled. A multidisciplinary approach, which utilises a variety of educational tools, such as case-based collaborative learning, problem-based learning, community focussed education, service learning and an extant body of knowledge from across the disciplines, must be engaged. Such an approach in itself leads to an educational process, which develops other core skills such as systematic thinking, communication, teamwork and interdisciplinary understanding. Sterling states that people should be engaged in a ‘critical pedagogy’ or ‘participative action research’ (Huckle 1999). These skills are crucial in solving complex environmental and social problems in the real world - a big part of which entails building relationships and understanding the needs of all involved. This fulfils what Steven Sterling calls putting the relationship back into learning. Such an educational approach will require the help of many disciplines focusing on

interconnections between the natural and built environment, and the economic and political forces that influence the world around us (Mc Nerney and Deakin 1996).

As such, ESD recognises the need for a holistic approach which incorporates the teacher, the student, the institution and the community. The literature suggests that the best way to teach sustainability is by action and example, stating that educational institutions should themselves be pursuing a policy of sustainability in every facet, from maintenance, to energy conservation, to organisational structure.

Furthermore, as sustainable education by its nature, embeds itself in the local community where it is based. Its teaching methodologies and curriculum will be tailored to the needs of that community thus increasing awareness, community integration and social adhesion while equipping the students to live in a sustainable way within their community. Hopkins and Mc Keown, (1999) say a program for SD must be developed for each region and defined by the communities of those regions. But no community is isolated and self-sustaining, thus, people need to have a broader understanding of the more complex globalised economy and society, and the impact their personal actions can have on the environment and others, both locally and globally. Thus, any programme for Education for Sustainable Development (ESD) must be based on local need but devised and implemented with global considerations. (Mc Keown, 2002).

2.4 Barriers to Change

Red flowers are red young man…
Harry Chapin

Mc Keown and Hopkins cite lack of vision, lack of awareness, lack of funding and lack of institutional commitment, as impeding the implementation of ESD to varying degrees. They go on to say, that, the biggest problem is lack of clarity regarding goals, and ask the question ‘do educators understand what is being asked of them?' They say, there is a lack of awareness within the educational community and public that reorienting education to achieve sustainability is essential (Hopkins and Mc Keown, 1999). Van Neirop (2008) and Hargreaves (2008) would support this and say that there is a need to raise awareness about Sustainable Development among educational staff. Moreover, it is necessary to highlight the importance of integrating SD into curricula as opposed to ‘adding on’ or creating new courses. This addresses the issue of burdening teachers and students with more work, and more information, often where curricula are already overloaded. Adding on SD modules to the curriculum merely gives the impression of sustainability. Mc Keown (2002) is careful about the use of terminology. She identifies the need to distinguish between education *for* sustainable development and education *about* sustainable development, stating that, one is an awareness raising theoretical discussion, and the other is using education as a tool to achieve SD.(Sterling in Huckle and Sterling 1996).

A number of the issues outlined above are borne out in the Irish context. In 2014 the Department of Education, Skills and Employment produced a comprehensive document relating to ESD. With regard to sustainable education in Ireland they cite numerous programmes and initiatives being undertaken by third level institutions, though they say 'silo-isation' of subject prevents a holistic cross-disciplinary approach. They also highlight the concerns about preparedness of lecturers to engage in participatory learning and they emphasise the need for a whole institution approach as opposed to its fragmented nature at present. The document also makes the point that there is a lot happening in this area but not framed or categorised as ESD by facilitators.

Corless (2011) supports this. He states, that a survey carried out to assess Environmental Sustainability, in third level institutions in Ireland, shows that many individual protection measures are being adopted, but a more systematic approach is preferable, of which, he says, there is a clear lack. He recommends that all colleges should adopt a formal Environmental Management System.

3 ESD AND CONSTRUCTION EDUCATION

To be part of this drive towards a state of sustained development and to facilitate wider social concerns the construction sector will be required to deal with the barriers within its own profession. These include: skills shortage; mind-set; short-termism; lack of innovation; reluctance to change and compartmentalisation of the building process. These difficulties are compounded by a lack of clarity around terms, such as 'green', 'eco' and 'sustainable' and its variants.

3.1 Sustainable Building Education

The aim of a Sustainable Building Education is to build resilience in students by equipping them with core competencies such as the skills and knowledge to solve problems arising from climate change and resource depletion.

As 'green building' in practice cannot be separated from a broader understanding of Sustainable Development, so too, green building education cannot be separated from the broader understanding of ecological literacy and sustainability principles (Kibert 2012). If we are to equip construction graduates with the skills and knowledge to solve problems arising from climate change and resource depletion, 'green building' can only be studied in the context of a fuller understanding of Sustainable Development and all its principles and issues.

Elshof (2005) states that the builders of the future need to be immersed in the problems and challenges that arise in today's society. To do this a technology education must be created with the potential to help students to think, process, design and build in a more sustainable way. Clayton and Radcliffe (1996 **page number ???)** argue, *" this change must be away from a closed systems perspective, in which there are simple definitions, fixed concepts and ultimate solutions, to an open systems perspective, in which both problems and solutions are multi-dimensional, dynamic and evolving''.*

Jamieson (2009) who has been developing a 'new education' for engineers, has already identified the strains occurring within the engineering profession as it attempts to manage this change. He concludes that a fundamental rethinking and reorganisation of engineering education needs to occur. If not approached correctly, changes can have the effect of overcrowding the curriculum and increasing the workload of both teachers and students. The PROCEED programme, which Jamieson played a key role in developing, was a research programme which lasted three years and set out to resolve this very issue.

Jamieson *et al* (2011) also touch on the notion of changing fundamental attitudes. They are specific about this matter, stating that we must shed the attitude of 'hubris' and take on an attitude of 'humility'. Also, we must acknowledge the limits of our species and recognise the constraints imposed by 'reality,' as well as the constraints to our individual skills and knowledge. Andrew Jamieson concludes, that, fostering a 'hybrid imagination' is required to develop a problem-solving competence comprised of scientific knowledge, technical skills and empathy for culture and global justice issues. He also defines this competency as; *'mixing natural and social, local and global, academic and activist forms of teaching and learning in new combinations.'* Page number??

4 CONCLUSION

This paper has considered why the education system needs to change and how Education for Sustainable Development can facilitate this change. It has also looked at the building education sector and how Education for Sustainable Development principles and be used to develop a sustainable building education that will build resilience in students and communities to meet the challenges of climate change and resource depletion.

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