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Things change: exploring transformational experiences within the UK construction industry

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Abstract

Our built environment has a significant impact on energy consumption, resource depletion, and ecological degradation - reducing this impact is imperative. Existing policies and research are dominated by the assumption that increased regulation, and an improvement in professional skills and knowledge, will address these issues. Conventional attempts at improving dissemination of good practice are questioned as the construction industry makes slow progress towards environmental responsibility[1]*.*

This paper argues for looking beyond a technical or regulatory fix, by exploring the potential opportunities for change that lie within the relationships between experience, learning, and the transformation of individual and professional perspectives. A transformation beyond that of acquiring skills and knowledge alone. An emphasis is placed on examining current practice of profligate energy and material use, whilst addressing the wider ethical and environmental responsibilities of equity and fairness. The paper outlines research based on twenty-two intensive interviews with individuals who worked on building projects with a clear commitment to an environmental agenda beyond that required by building regulation. Individual experiences are explored through nine key emergent themes, which in turn inform potential opportunities for future transformation.

Introduction

The debate regarding resource depletion, environmental degradation, greenhouse gas emissions and climate change continues, and many now see the threat of climate change and associated feedbacks as *the* imperative facing humanity, and one that we remain reluctant to address (Marshall 2014). The transformation of the construction industry is of utmost importance in these times of ecological fragility and increasing certainty of the anthropogenic impact on climatic behaviours (IPCC 2013). Towards the end of the last century much of the debate around environmental performance of buildings related to energy efficiency and conservation, with legislation mainly addressing new build projects. Whilst retaining a strong focus on energy conservation, the emphasis has shifted from new buildings to refurbishment of existing with projects such as Retrofit for the Future (TSB 2014) and industry awards specifically targeting retrofitting projects (AJ 2016). Focusing on energy conservation and related reductions in emissions remains an imperative, however leading the drive for greater environmental responsibility solely through regulation is neglecting motivations that lie behind behavioural change and the desire to construct in an environmentally responsive and responsible way.

1 Environmental responsibility is defined by the author as **being accountable for one's actions that in turn affect the conditions under which life is developed.**

Building on recent quantitative studies this research emphasises the need for the construction industry to respond to the environmental agenda in ways that allow for learning and transformation beyond skill acquisition (Hartenberger et al. 2012), exploring how environmental practice within the construction industry can be influenced through changes in individual practice by understanding "more fully the essences and meanings of human experience" (Moustakas 1994:105). The research moves away from the quantitative focus on energy consumption, legislation, and regulation, towards examining individual values and commitment, acknowledging that where individual values are influenced by experience and learning this creates an opportunity for transformation.

The research places the construction industry in a specific framework hinged around three main realms of investigation: environmental responsibility, learning, and the built environment. The interconnected nature of these three realms is described in figure 1 below. This model starts to suggest potential dynamic links between personal values, commitment to processes, perceived ambitions and motivations. Each realm has associated spheres of influence exerting a force on practice. As an example: a level of commitment to environmental responsibility can be exerted through regulation - in the form of building control, by economics - in the form of market forces, or by values – the ecological values held by a client. The model is interpretive and dynamic through which connections and relationships between the realms can be explored.

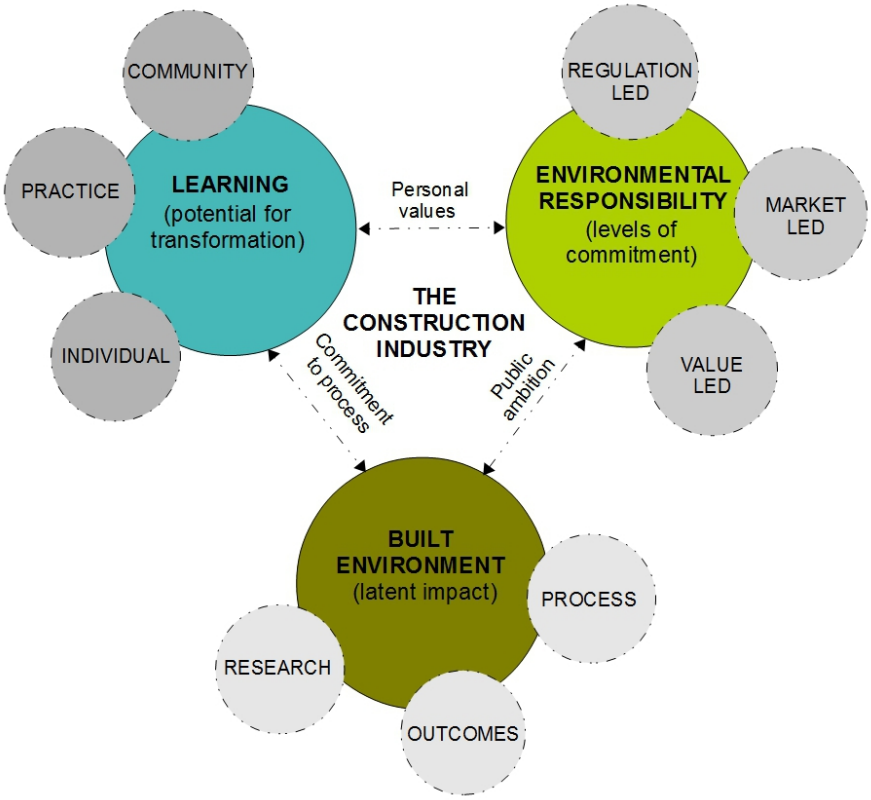

Figure 1. Realms of investigation, spheres of influence and potential connecting motivations

Defining the realms

Environmental responsibility

Communicating our environmental predicament has preoccupied activists, researchers, and campaigners for many decades. The question of how to engage in dialogue about our environmental impact remains a very current one. Hillman (2004,2014) has long argued that our "predicament" is so catastrophic we need to re-evaluate what scares us more; losing our way of life or losing the planet. He has long promoted a top down approach to change by calling for carbon emissions to be controlled through international governmental intervention, as individuals en masse are incapable of coming to the "right" decision (Hillman 2014). Fox (2009:16) argues the biophysical realm is more

important than the human realm, which in turn is more important than the human constructed realm. This leads us to question whether humans have an inalienable right use the biosphere to feed/fuel the constructed realm. The human right to life compromises nearly all other life on the planet, which demands an ethical, value led consideration of the rest of the 'natural' environment. Communicating the need for environmental responsibility is complex and requires behaviour change, which can be unsuccessful if all we try to do is terrify people into action (Evans et al. 2013). It is argued here that the current unsustainable situation in the built environment is a moral and social one, rather than a technological or scientific one. That our approach towards environmental responsibility is influenced by our values, as well as market and regulatory pressures. As Moore (2010:9) argues "unsustainability is not a scientific or technological problem it is a social one".

Learning and degrees of transformation

> The best way to understand is to do. That which we learn most thoroughly, and remember the best, is what we have in a way taught ourselves (Kant 1900:80).

Learning occurs throughout and across our lives and is not confined to formal learning contexts such as school, college and university. Learning as an adult is likely to occur in more informal or non-formal situations, taking place as part of everyday life and outside of any intentional process (Alheit 2009:117). This research adopts an approach to adult learning, and in particular learning within the workplace, where experience and context is critical (Illeris 2011). Learning in this sense is experiential and influenced by our community, our practice, and our individual actions and is not confined to formal learning situations or established routes to professional qualification.

Concepts of transformation here are informed by the work of Mezirow (1991) and the subsequent dialogues within transformation theory that reach beyond cognitive processes exploring deeper, personal transformation and how those places of transformation might be created (Cranton 1996; Dirkx 2006). Transformation theory is used to inform a position and is examined alongside other adult learning theories relating to workplace learning, and learning as a social experience (Illeris 2011). All learning has the potential to be transformative, and whilst there are shared concepts it is important to draw a distinction between transformation as change, and transformational learning as a theoretical basis for perspective transformation (Mezirow 1991). Learning here is concerned with the developing theories of transformation and social learning and the ability for learning to engender change (Dirkx et al. 2006; Wals and van der Leij 2007), as well as aiming to develop the debates centred on built environment education and professional practice in the construction industry.

Built Environment

This research questions the current problematic issues within the built environment professions where profligate energy and material use is often rewarded and awarded (Hatherley 2014), and where wider ethical responsibilities appear to be neglected for short term gain. The construction industry has been identified for its significant role in energy consumption, resource use, and waste generation (Vale and Vale 2013). The built environment requires vast resources, in 2010:

> the world's buildings accounted for 32% of global final energy use and 19% of all greenhouse gas (GHG) emissions. Under business-as-usual projections, use of energy in buildings globally could double or even triple by 2050 (Chalmers 2014:4)

If a business as usual (BAU) approach is maintained the impact can only be expected to worsen as a predicted global increase in the industry of 70% by 2025 starts to take hold (Betts et al. 2013). Issues of inconsistent performance, lack of dissemination, and limited adoption of good practice form a vision of an industry that is lacking meaningful acknowledgement of its wider ethical impacts. An example is the increasingly problematic issues around building performance, where assessment outcomes at design and post-occupation diverge, and a vast discrepancy in predicted and actual

energy use emerges (Bordass and Leaman 2012). The few existing exemplar projects appear to have had little influence on the construction industry as a whole (Tofield 2012).

Regulation has gone some way in changing the industry, to rely on it alone will never be enough to implement the changes required – in this complex industry there is no one silver bullet. External influences on industry change are unstable and subject to short term political and economic forces that are beyond the control of the individual and profession. Established strategies to develop environmental responsibility within the industry remain the acquiring of skills and knowledge, rather than time spent exploring ethical frameworks or how future practice might be informed by past experiences. As Wals and van deer Leij (2007:17) argue:

> What is clear by now is that to break deeply entrenched, unsustainable patterns (assumptions, behaviours and values) requires a new kind of thinking inspired and informed by powerful learning processes.

Research process

The research is based on experiences of twenty-seven construction industry professionals, explored through twenty-two intensive semi-structured interviews conducted in two phases. Phase 1 consisting of five scoping interviews with architects, proceeded by eighteen intensive interviews with architects, engineers, clients, and contractors who worked on one of four building projects (see figure 2). Phase 2 took place three years after phase 1, with four of the original participants. Each phase 2 participant was selected to represent one of the four building projects and one of the four industry professions.

The four building projects used in the main body of the research - one commercial, one residential and two educational buildings – were all completed post 2008 and selected for their building performance assessment at design stage and wider environmental ambitions. The architect(s) for each of the four projects were identified as the primary lead and they then provided contact information for subsequent interviews with the client, contractor and engineer(s)[2]. Thus making use of what Creswell (2013) refers to as chain sampling, with each interview leading to the next link.

Annells (2006) suggests adopting three theoretical approaches as a way of redefining the tension that can exit between the role of the researcher and the generation of text. This approach was reinterpreted as an exploration of the complexity of the experience of built form, and arises from the equally complex experiences explored within the interviews. The individual experiences – captured through the interviews and transcribed – were thus analysed from three emergent perspectives: the individual, the profession and the building project (see figure 3), using each lens as an interpretive tool. In this sense there is a three-way approach to analysis and interpretation of the generated text.

The generated knowledge is rooted in reflection on experience, with the participants bearing witness to change within the industry over an extended period of time. Engaging in reflective opportunities or events tends not to be focused on in the construction industry as "people are immersed in a world that normally unfolds automatically" (Seamon 2000:5). This research was able to capture and give significance to the learning and change in practice and perspective that take place outside of skills acquisition alone.

2 Engineers includes services engineers (also referred to as mechanical and electrical engineers) and structural engineers.

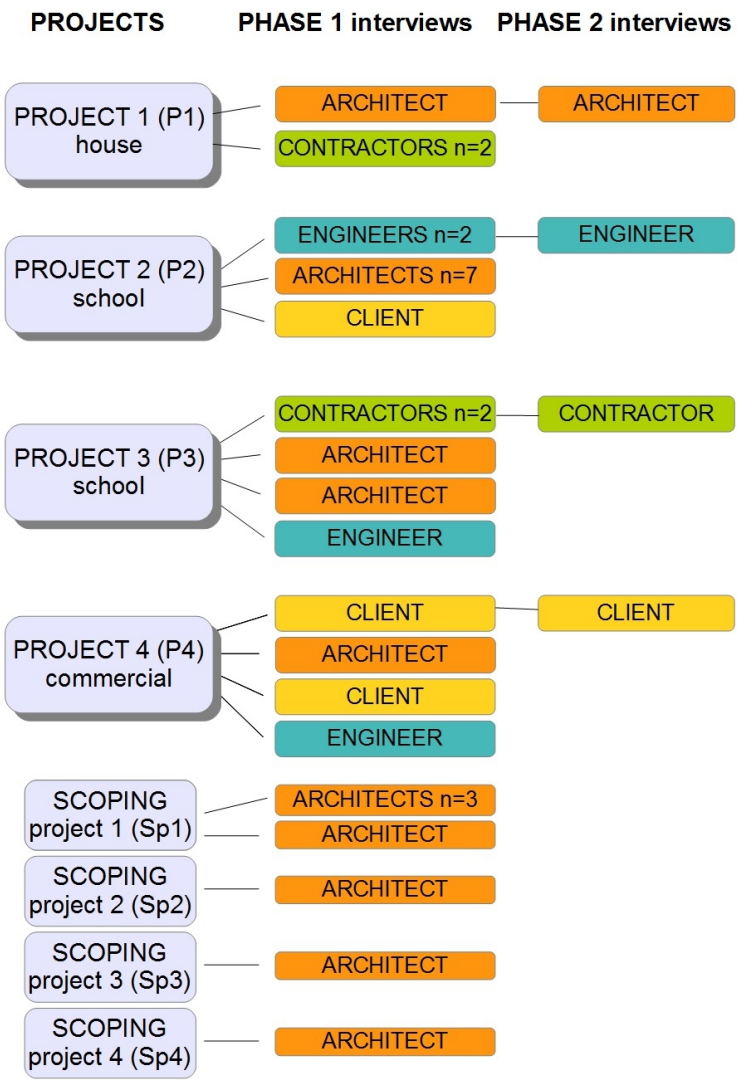

Figure 2. Research process – phase 1, scoping, and phase 2 interviews

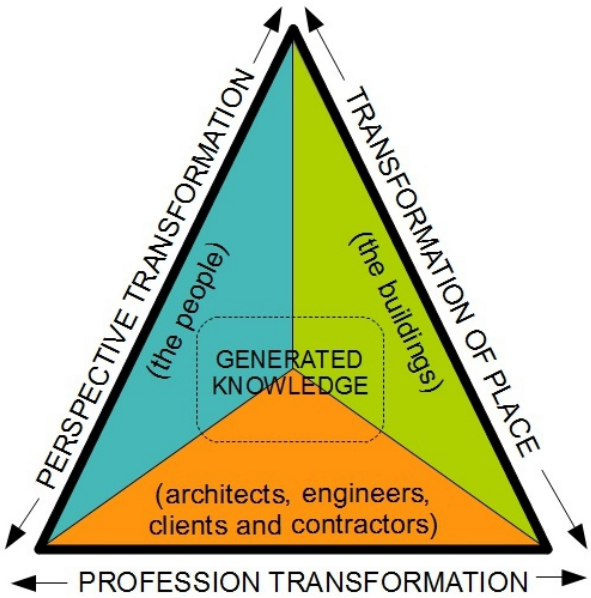

Figure 3. Analysis process - three perspectives

Research outcomes

The analysis of the transcripts allows units of general meaning to emerge through the experiences of the participants, their interpretation of events and, the researcher's interpretation of the emergent themes within the generated knowledge. Through this process nine key themes emerged which represent the interwoven axiological tendencies threading through the research and capture the participants' individual experiences rather than fact. The nine themes are gathered under three key headings – commitment, compromise, and compliance. Figure 4 (below) captures the outcomes in a matrix where each theme is explored through each lens along with the essence of each theme.

EMERGENT THEMES EXAMINED THROUGH EACH LENS: PROJECT, PROFESSION AND PERSON

COMMITMENT	**PROJECT (the buildings):**	**PROFESSION (architects, engineers, clients, contractors):**	**PERSON (the people):**
the deep end	invites questioning and challenges learning	learning through doing – formal and non-formal routes	personal experience and those of others count more than data
just who I am	project as learning rather than profit – challenges planning and preconceptions	professional body regulation and alignment with personal values	personally held values and attitudes affect environmental behaviours
doing the right thing	capacity for responsive cohesion, performs according to design	adhering to a code of conduct and working beyond it	deontological ethics – society and duty
COMPROMISE	**PROJECT (the buildings):**	**PROFESSION (architects, engineers, clients, contractors):**	**PERSON (the people):**
sharing ambitions	project embodies physical evidence of aims	cross and interdisciplinary boundaries challenged – a no blame culture	working with like-minded people
feeling and being separate	aesthetics and sense of place	frustration with professional practice and teaching	not fitting in with the perceived norm
valuing reflection	importance of post occupancy evaluation	embedding reflective practice in the everyday	opportunity to reflect on work
COMPLIANCE	**PROJECT (the buildings):**	**PROFESSION (architects, engineers, clients, contractors):**	**PERSON (the people):**
pushing boundaries	challenging the norm – site specific	new ways of working across disciplines	challenging a business as usual approach
ticking boxes	compliance with regulation and assessment	compliance and creativity – pushing for change	compliance is not enough
anticipating change	future proofing fabric and services	professional roles changing and being challenged	future directions and diversification, learning and new challenges

Figure 4. The nine emergent themes mapped against project, profession, and person

Themes are illustrated with extracts from the research interviews in the following sections:

the deep end

Illeris (2011) argues that being engaged in challenging work creates engaged learners who learn more and better, however challenging work can also produce stress or a feeling of lack of control. You may learn rapidly when confronted with a new situation, such as being thrown into the deep-end of a swimming pool, but this can also produce a feeling of being out of control. During the interviews these experiences were remembered as difficult to endure or cope with but when reflected upon a deeper and more valued experience became evident. As one architect recalled when the roof leaked on their first job as project architect:

> suddenly then I thought this isn't, this isn't fun, this isn't something which you put a picture on the wall and you take it down after six months when you're bored with it, it's there for good […] these buildings that you're creating, you're putting people in to work or to live (Architect)

Here the external factors of a leaking roof work with internal emotions and values to transform thinking and heighten a sense of responsibility. The deep end creates an opportunity for learning and

transformation when the experience is reflected upon, this opportunity may not be evident at the time due to stress, fear, or a feeling of lack on control.

just who I am

Participants were invited to consider how their motivations for environmental actions were influenced, the answer was often that it was just part who they were, that environmental issues had always been important to them:

> it's just an inherent characteristic that I've got I think, it just so happens that it aligns with what [...] the world is facing at the moment (Engineer/services)

This notion this motivation is 'just' being part of who they were was a strong thread through the conversations. Acting on intuition is valuable and significant in creative thinking and design (Serraino 2016) and value led action, what Freire ([1974] 2008) refers to as praxis, has been identified as significant in learning and transformation (Schapiro 2009:103). However if the profession becomes overly reliant on lone environmental champions to instigate change there is then a danger that those individuals may become side-lined, appear as outsiders or as environmental pariahs.

doing the right thing

In many ways this theme underpins the previous two as it embraces an ethical motivation. The 'right thing' is not confined to environmentally responsible behaviours in an ecological sense, but expands through the participants comments to include social responsibility:

> I think sometimes that [pause] perhaps we don't think enough about the, the people who are in that environment, you know the people (Contractor/site)

When environmental performance is demanded by building users this can force development in a particular direction. Depending on building occupants, users, and/or tenants to change the direction of the industry cannot be relied on as a single strategy, motivations can be fickle and dependent on economic fluctuations and cultural aspirations. Despite this individual action is seen as significant as one contractor comments:

> it takes people who want to change things, who want to challenge it to make it happen […] there needs to be a bit of a change in mentality I suppose but you know if you're going to do it you could do it for the right reasons (Contractor/site)

sharing ambitions

The clients, architects, contractors, and engineers interviewed for this research all talked about communication being at the root of a successful project. This was not confined to communication between team members but included communication and cooperation on an industry wide basis. Working with a sense of shared environmental ambition was acknowledged as increasingly realisable as awareness shifts and the industry slowly transforms. Specifically for one architect in a phase 2 interview there was no longer a need to “stand over” contractors as had been commented on in the phase 1 interview. There is recognition here of a change in the industry in the three intervening years, a change in ambition and action, representing a reversal of prior roles as learning flows both ways:

> there are a number [of smaller contractors] we've worked with now who really are teaching themselves stuff [...] they're actually quite keen to join in and they want to be involved and want to try things and want to learn about things […] there are even a couple who [are] possibly teaching us stuff (Architect)

feeling and being separate

Participants frequently identified as being outside the norm in a professional context, actively departing from a business as usual approach. Contractors on one project expressed a desire to identify as outside of the industry, this need was rooted in a dissonance with professional practice:

> [as contractors] we aren't the typical, normal of the building or construction industry, so I mean we are quite, we are willing to learn and quite interested in changing (Contractor/engineer)

These contractors consciously operate on a level they view as being beyond the rest of their profession, at times this was expressed as frustration with the slow rate of change. Other participants referred to this separation as being at the lead, the forefront or outside of the mainstream.

valuing reflection

Participants placed value on having the opportunity to reflect on their work and experience through the research interviews, focusing on the importance of looking back, thinking, and talking about a completed project. For the participants the experience of reflecting was a valid process in and of itself, albeit one that involved a reassessing of action and perspective. There are explicit statements within the interviews commenting on the value of sharing and discussing experiences more widely within their own practices and within the profession more widely:

> we have talked about doing this in a more formal way and I think it would be good to do that actually, you know lessons learnt […] you do take lessons and you do incorporate it but you don't necessarily incorporate, I don't necessarily incorporate what [a colleague] learnt I incorporate what I learnt (Architect/senior)

pushing boundaries

Pushing the environmental agenda forward was important for the participants, an example of this professional positioning comes from one of the clients interviewed:

> I sort of describe the green agenda as being a bit like a comet […] at the front of that comet is somebody or something that's constantly getting bashed up and beaten up […] then there's a ball of energy behind it, and then behind that there's a whole load of hot air and dust and rubbish, and we always wanted to be not in the front, and not in the rubbish at the back, but in that body of energy pushing it forward (Client/developer)

A desire to push forward with techniques and approaches ran through many of the interviews, either as a personal motivation or a professional commitment. This pushing is instrumental for change within the industry and can have wider impact, as this architect recalls of one school project:

> you could see the whole thing click, clicking with him [the contractor], and we put in a green roof and all of a sudden he was talking about paying to put in a webcam so the kids could see […] a rare type of bird that feeds on a particular type of green roof […] he [the contractor] suddenly became involved in the process (Architect)

ticking boxes

As building regulation becomes more demanding in terms of environmental performance building assessment tools may become less relevant. A contractor indicated a change in attitude towards one particular assessment method, and commented that on a recent project they had chosen to work "in the spirit of BREEAM[3]" rather than pay to go through the assessment process, thus saving their clients an additional cost:

> we are designing in the spirit of BREEAM very good, we're not going to pay to have it assessed […] because we're not going to submit it to the BRE because there was a saving which the client took (Contractor/builder)

Here the contractors move away from a tick box mentality to working with values and ambitions for a project rather than specific performance criteria. In many ways ticking boxes is what BREEAM and

3 Building Research Establishment Environmental Assessment Method is a tool for calculating building performance. Credits are given for various aspects rated against performance targets and benchmarks, buildings are rated in six categories, from unclassified to outstanding.

other assessment methods demand. There is general acceptance that some form of assessment is useful but with the caveat that environmental measures should be meaningful rather than incidental.

> just because you can get a certain rating by ticking certain boxes because you happen to be in the right location, or whatever it is, does not mean that this building matches up to credentials (Architect)

What is needed is a new way of thinking about sustainability, in particular use of resources and designing and building differently, for one engineer the solution was quite simply – efficient design.

> I think we do over talk a lot […] for me I think the best thing we can do is design efficiently (Engineer/structural)

anticipating change

During each interview there were comments and criticisms of current practice and how it might improve in terms of environmental responsibility, sometimes these comments were focused very specifically on materials or systems, whilst other comments focused more generally on the industry's perception of change. Those interviewed had obviously given prior thought to the way the industry was moving, what works and what might work better to change behaviours within the industry as a whole. At the time of the phase 1 interviews the building regulations had started to influence building services, at the time of the phase 2 interviews further revisions to the building regulations had only recently come into effect. Despite the revisions to building regulation one concern was the retention of knowledge, that as the money got tighter some of the environmental measures would be lost, as they were still perceived to be an added cost:

> the danger is you slice off that, you know, all that good work, and you end up back with [...] just purely building regs approved boxes, I think that's the danger (Client)

Discussion

The research outcomes discussed here represent a summary of a much larger piece of work looking to future solutions and professional landscapes by drawing on experiences rooted in the past. Reflecting on a project can reveal how environmental values and professional actions are dependent on the shifting sands of economic fluctuations, societal expectations, and personal situations. Fox (2009:23) argues these issues need to be equally challenged, demanding a questioning of approach and a transition in how professional roles are perceived. Challenging attitudes and behaviours, whether personal or professional, requires perseverance and reflection, as Walker (2014:105) identifies:

> Systemic transformation and a change in course will occur, if at all, through changes in the attitudes of many individuals volitionally placing greater emphasis on the study, practice and living of reflective, examined lives; and in such endeavour, we are all beginners.

Recognition that change within the industry is necessary in order to address environmental issues is common among the participants, although there is differing on how much of an imperative it is and how it might be achieved. The route to transformation varies, within this research a refocusing on education and well-being is called for as representing an opportunity for questioning and changing the human condition. Education, explored here through non-formal learning, offers a route to change, as Hostetler (2011:200) comments:

> Transformation is transcendence, lifting the level of one's self. What greater opportunity is there for doing that than education, people being together in joyfully experiencing universal questions of the human condition?

Over the past decade a number of reports have documented the need for the construction industry to transform; strategies indicating a way forward are often focused on training and skills and there is still a recognised gap in the skills and knowledge required by built-environment professionals (Farrell

2014). Increasingly the education of future professionals is being considered in terms of higher education and formal learning, with research focusing on embedding sustainability into the curriculum within formal education. Where research has focused on sustainability, such as the pan-European EDUCATE research programme (Altomonte 2010), this has placed an emphasis on professional knowledge rather than values or motivations for individual behaviours. The identified need for change in the industry and in the professional actors within it still focuses on skills alone, as highlighted in the Construction 2025 report which states:

> [...] the industry faces a pressing need for a capable workforce that can deliver transformational change in the next decade. As the wider economy emerges from the recession, construction firms must be able to recruit and retain skilled, hard-working people in sufficient numbers to meet the increasing demand for construction. We must also be able to recruit and develop people with new types of skills (HMGovernment 2013:44).

There are numerous pressures exerting on the construction industry: increasingly stringent legislation, increased economic uncertainty, climate change, fuel pricing, energy efficiency and finite resources, representing an imperative for the industry to reform (Betts et al. 2013), but where is the time in the site hut or design team meeting for reflection and challenging perspectives? Murray (2013) reports changed perspectives following workshops based on techniques used in neurolinguistic programming. The accounts of those workshop experiences share parallels with Mezirow's transformation theory and in particular the experiencing of a disorienting dilemma (Mezirow 1991:168). These types of reflective encounters can equally produce a deeper transformation of the soul, which we may not be consciously aware off (Dirkx 2006), and encourage us to confront wider global and ecological issues. Necessary industry changes can manifest through transformative opportunity. Figure 5 (below) starts to map where those potential transformative opportunities arise within the industry as they emerge from the nine themes.

COMMITMENT	TRANSFORMATION
the deep end	experience and learning
just who I am	values and behaviours
doing the right thing	duty and society
COMPROMISE	TRANSFORMATION
sharing ambitions	like minded community
feeling and being separate	place and space for change
valuing reflection	embedded opportunity
COMPLIANCE	TRANSFORMATION
pushing boundaries	embracing difference
ticking boxes	challenging compliance
anticipating change	future reflection

Figure 5. The nine emergent themes mapped against transformative opportunity

We need to develop ways to embrace a commitment to environmental responsibility and transformation by supporting the professions and developing what Sterling (2009:82) refers to as a

“collective connective consciousness and competence”. Illeris (2011) highlights learning as a social action with many levels of change and transformation which neither end nor begin with formal teaching and learning. The challenge for the built environment disciplines is to move away from prescriptive silo delivery in higher education, and develop environmental and ecological learning through reflective, collaborative, and participatory practices within professional learning (Jones et al. 2012).

Conclusion

> If tinkering reforms are not an adequate response to our plight - and they are not - we must rethink our initial assumptions about learning and the goals of education (Orr 2004:41)

We need to shape the construction industry so that values can become embedded rather than relying on legislation and regulation to drive actions, which appears to be leading to a skills shortage where knowledge is acquired rather than change manifesting from within. One of the constant themes of the environmental movement has been how to get thinking and practical strategies into the mainstream. This research suggests that whilst legislation may require levels of environmental responsiveness, motivation also comes from individual environmental responsibility.

Interrogating the role learning plays in inspiring and transforming engages us in a debate rooted in environmental and social movements from the mid 1960's. Movements concerned with equity, preservation of the world's diverse ecology and resources. Reflecting on professional practice has been found to be transformative and restorative; reinforcing previously held beliefs and validating commitments to both environment and community. One of the challenges faced is using this to inform how and what we teach, how we work, and how we create environments for transcendence and transformation within the professions.

Environmental responsibility is not an adequate definition for the ambition or action required. It carries more precision than sustainable development but the argument remains as something beyond ourselves; our values, and our experiences; and begins with learning in its broadest sense. We need to be accountable for our actions that in turn affect the conditions under which life is developed, and to build resilience through responsibility within our professions, our communities and our wider world.

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