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Which Way is Up? Space and Place in Virtual Learning Environments for Design

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Abstract: *The role of ‘place’ in design education is essential in providing a structured learning experience that can be trusted and which allows dynamic social connections to emerge in the development of reflective practice. With increasing demand for distance and online learning resources, this paper considers how such a sense of place can be arrived at using ‘virtual architecture’. Analogies with physical architectural space – for example ‘homes’, ‘forums’, ‘studios’, ‘libraries’ can be useful, but in many ways the opportunities for design learning in virtual architecture go far beyond what is possible with physical architecture. We describe how the virtual architecture of an Open University course in Design Thinking has consciously tried to create place rather than space, in crafting an environment with intrinsic learning opportunities, and the benefits this has brought to students studying the course.*

Keywords: *Place, space, design education, virtual learning environments, phenomenology.*

1. Introduction

In our physical world gravity is a universal force that acts downwards. It creates weight, it makes things difficult, but it also makes things possible. It's also constantly there, to the extent that we don't think about it. We experience its effects – we get tired when we climb a long staircase, for example, or are exhilarated when we can freewheel down a ramp – without necessarily thinking that it is gravity that is enabling these feelings. It also has a linguistic life. People, actions, and situations have gravity if they are serious and, as Lakoff and Johnson (1981) have argued, gravity provides us with all kinds of fundamental metaphors about how we understand (up is good, down is bad).

In the virtual world gravity does not exist, though in many ways we expect it to. We still expect things to fall from up to down, not the reverse. We can easily imagine gravity even when it doesn't act through nature. Yet we don't need it and that hints at a more complex idea of what is achievable in virtual worlds. The asymmetry in what we understand about gravity in virtual and physical worlds is less obvious for a concept like 'place' however. We have a strong sense of what 'home' is in both physical and virtual worlds, even if we can't say exactly what that is. The idea of place, then, unlike gravity, extends across the physical and virtual worlds, where, for example, strong feelings of what home is in both physical and virtual worlds seems much more familiar. Yet 'place', so central to our experience, remains an elusive concept.

In this paper we develop an idea about place in working towards applying architectural and urban design conceptions to the creation of online educational environments for design. These notions of place are then used to demonstrate some of the mechanisms for place creation in for an online Design Thinking course created by The Open University in 2010, and now studied by more than 2000 students.

2. You are here

2.1 *The attic and the cellar*

Gaston Bachelard, in his book *The Poetics of Space* (Bachelard 1994), describes architecture in a vivid, phenomenological way, exploring how we conceive the physical world around us. Rather than simply viewing our environment as a series of objective elements, Bachelard argues that we are constantly interacting with it – interpreting, filtering, and attaching our ideas and values to it. The ideas we conceive about our environment are, then, every bit as important as the physical things we perceive. Bachelard uses the examples of the cellar and attic as two very different conceptions of place in a house:

Verticality is ensured by the polarity of cellar and attic, the marks of which are so deep that, in a way, they open up two very different perspectives for a phenomenology of the imagination. (Bachelard 1994)

Bachelard is suggesting that there is something very different in our conception of going up to the attic when compared to going down to the cellar. We not only perceive the attic and cellar, we react to them as very different objects with different values attached. For Bachelard, the phenomena of attic and cellar are the 'real' events – not simply the physical objects themselves. Moreover, he also suggests that these two examples, attic and cellar, are conceived so strongly that we actually generate further conceptions – that of up, down, or verticality.

It is this kind of phenomena that is of interest in this paper, the idea of the thing in our minds is necessarily different to the reality of the thing outside of our minds. The significant aspect of concern is the *conception* - the event we conceive in our minds. It is argued that this conception is a fundamental aspect of place and place creation.

2.2 Doorways

Other writers and practitioners have argued in similar ways to Bachelard. The architect Aldo van Eyck refers to 'occasions' in architecture, giving the example of a doorway as a "...localised setting for a wonderful human gesture." (Smithson 1968). Bloomer & Moore write:

The feeling of buildings and our sense of dwelling within them are more fundamental to our architectural experience than the information they give us. (Bloomer and Moore 1977)

Some architects clearly think more in terms of the human behaviour in place. The Dutch architect Herman Hertzberger famously made the behaviour of people a priority in his architecture, proposing the existence of 'arch-forms'; underlying spatial arrangements that have meaning when human interaction with them takes place (Hertzberger 1991).

But in none of these examples are explicit definitions of place given that might be of useful application in any sense other than the general. Indeed, for many of the architects, designers and writers quoted above, it is only through the use of extensive written and verbal exploration that we are able to achieve any understanding of the particular aspects of place. As with phenomenology, we are able to understand what is meant by place in architecture, and can even discuss it at length, but it is difficult to be explicit or precise about the particular aspects we might predictably use to create place from nothing. The American architect Louis Khan summed this up perfectly in architectural terms:

The Agora, for instance, was a place of happening ... a recognition of something which you can't define, but must be built. (Wuman 1986).

2.3 Interactions

Place is not only used as a philosophical or architectural conception. In fact, it could be argued that the disciplines of geography, sociology and ethnography have contributed just as much to our understanding of place as architecture - at least in terms of their explicit use of the word itself and attempts to incorporate the richness and complexity of place into their studies.

Theorists have drawn on these disciplines in presenting broader ideas about how spaces can be used to create place. Christopher Alexander, for example, describes the 'natural' city comprising of complex, overlapping interactions between events, objects and people, leading to the creation of 'city units' (Alexander 1966). Cities created by intentional zoning or separation of these elements (artificial cities), lead to reduced richness of experience and possibility of interaction. Meaningful and valuable human engagement with the city, Alexander argues, requires that complex and emergent events occur between things. This emergent behaviour lies at the heart of Oldenburg's concept of 'third places' (Oldenburg 1999), interstitial places of behaviour that people naturally seek out to enrich their lives.

These considerations of place clearly provide a strong hint that the elements that make up any place are certainly more than the physical components of that space.

2.4 Did you remember where you were?

Generating a 'mental map' of our environment is necessary to how we operate in physical space and there is a growing body of research to show the importance of spatial conception in cognition. Cognitive mapping in buildings demonstrates just how disruptive poor spatial arrangements can be to how we make, navigate, and make sense of a space (Carlson, Holscher, Shipley, & Dalton 2010).

Once understood, though, experience of physical space can be used cognitively. The technique of creating memory palaces (Yates 1992) creates a cognitive structure by using the physical experience of space. Learning to recite the complete works of Shakespeare can be achieved through interaction with place (or space that has meaning to us).

What is important in all these examples is the requirement for people to *conceive* of their environment - not simply *perceive* it. To generate the meaning or value we apply to (or take from) space, we must embody both the physical perception and the cognitive response. It is argued here that this embodiment, or conception, is some aspect of the definition of place we seek to explore in virtual space, and particularly virtual learning environments.

2.5 You are here (again)

In virtual environments, like first person computer games or virtual worlds, we have the freedom to create any shapes and spaces we wish to, though typically we tend to ape physical reality, since we believe that a translation between physical and virtual will bring with it a similar translation in meaning. 'Rules' can be generated to maintain the illusion - we make sure avatars cannot go through walls, we simulate gravity, we make use of spatial arrangements that make sense in terms of physical reality and help us to understand ourselves as being 'in' the environment.

The success of first person computer games, however, doesn't rely on a recreation of reality alone (Coyne 2003) and the success of other types of computer game is interesting to consider. This success could be due to computer games being essentially self-contained learning environments. Places to achieve, and to be recognised for that achievement.

The failure of 3D virtual learning environments then is equally interesting to consider (Doyle 2008). Directly copying physical environments (the maths building is right next door to the physics building) is a prime example of the generation of space without consideration for place. The failures of virtual university campuses, for example, are failures to recognise that complex elements in perception and conception are also required. Just as with architecture, the creation of blank space in the hope that place will emerge is fantasy.

In more traditional online spaces, such as websites, social media environments or virtual learning environments, we use 'home' pages, 'portals', 'forums' and 'navigation' to describe patterns of space and portray the virtual space being presented in a physical way. And the fact is that this works at a simple, spatial level. Dalton et al (2002) provide examples of studies into the similarities and analogies between physical and virtual environments in cognitive neuroscience and psychology. But they go further by considering the human use *in* such spaces, not simply use *of* those spaces. In other

words, the use of virtual space relies as much on psychological and social aspects as our use of physical space.

Virtual worlds can clearly allow complex social constructions to emerge and exist, with communities forming, for example an online blogging community, and social interaction taking place (see Twining & Footring (2008) for one of many examples of this). Even negative aspects of any socially organised system can be found (see Carr, Oliver, & Burn 2008; de Jong-Derrington & Homewood 2008; Minocha & Tungle 2008, for examples). In each example, the complexities of social interaction we might expect to see in the physical world are present in the virtual analogy, with all the rich and emergent behaviours required for place creation evident.

The role of place may not be openly discussed by website designers but it is implicit in every element we use to structure increasingly sophisticated online environments. Indeed, talk of an environment at all presupposes an idea of architecture, rather than simple layout. And in any environment, place is an essential element in allowing human behaviour to emerge, and for learning to occur (or take place).

3. The architecture of education

3.1 The journey

The architecture of museums has increasingly sought to educate at a deeper level than merely providing wall and floor space to show off carefully curated items. Rather than let us wander idly around, creating our own meanings and connections, we are increasingly (and ironically) led down a well-trodden path, on a 'journey of discovery'. Lloyd (2011) writes:

That hollow feeling is the feeling of being manipulated by a building with a purpose. The purpose being to deliver an experience, like a ride at a fair ground. It might seem interesting and exciting at the time, but it's soon forgotten. What we tend to remember are the people we meet, the unexpected conversations we might have, and the funny things that happen to us; the human things that connect us. Of course these things can happen in iconic buildings, but the buildings themselves aren't helping us when they manage us through an experience in our own little bubbles, coughing us up into the gift shop at the end. (Lloyd 2011)

Clark & Maher (2001), Brook & Oliver (2003), Northcote (2008) all discuss the importance of a 'sense of place' in online educational environments. Brook & Oliver refer explicitly to anecdotal evidence from teachers and note the difficulties in assigning value to particular aspects of community creation. Northcote provides lessons learned without defining the mechanisms of success, only suggesting them. Clark & Maher suggest, like Louis Khan, "Architects create space – people bring Place".

Similarly, Swan (2006) argues that successful virtual learning environments require "...a clear and consistent course structure, an instructor who interacts frequently and constructively with students, and a valued and dynamic discussion", clearly setting out that the behavioural aspects are just as important as the discrete 'physical' elements.

The analogy to notions of place described in the previous sections are striking. All note that place in an online learning environment has social and pedagogical significance. But they also recognise that the precise mechanisms for the emergence of such places are not well understood.

A counter argument may be applied to learning designs. Why should we hope that speculative, context-less information should be meaningful without the opportunity for place-making, interpretation, value and all those other necessary human desires expressed by Khan's vision of architecture or Alexander's rich 'city unit' that go to reinforce a deeper learning experience, rather than providing something like entertainment?

3.2 Stopping along the way

The core element in most virtual learning environments is information, usually static and displayed as a hierarchy. In terms of information architecture, this is a spatial pattern that we are all familiar with from early education onwards. A simple analogy is a book, where the title, content and chapters form an immediately recognisable 'map' of what can be expected.

Making use of these sorts of analogies makes a lot of sense but care does have to be taken. If we are creating a large learning environment, say of a year's worth of material, this does leave us with a very big book indeed. In response to this, we might then divide up the material into several 'books', each with a certain theme, logic or shape. These might then be collected together and presented to students as a structured set of information.

But this perhaps misses the fact that orientation to learning material occurs in other non-linear ways – just as place-making in towns and cities relies on more than road layouts and landmarks. Successful students do not simply spend their time taking in learning materials in a linear fashion – they spend time making *sense* of learning materials. It is certainly true that a spatial, cognitive map of information may be formed but it is argued that, just as with our physical environment, this map is personal as well as rational. We may see the overall structure but we also overlay this with detail that allows us to relate to that structure at different scales. Just as the good author takes care to present their work in a way that avoids cognitive dissonance, they also allow the possibility of cognitive resonance with the structure and form. Moreover, it is possible to make active use of such cognitive structures to support the learning material itself.

Online courses are now emerging at an incredible rate but many only provide information repositories that are not designed for active student learning. In other words, they are virtual analogies of passive, information-based learning models that often offer very little opportunity to embody any of the knowledge they seek to impart. It may seem very obvious to state it, but the quality of online learning courses has an impact on the students' experiences and learning outcomes (Tallent-Runnels et al 2006).

In Urban planning, Alexander suggests that prediction of, and planning for, place is simply too complex to be represented, far less designed. Similarly, many of the notions discussed thus far are complex ones without precise and predictable mechanisms that can be used directly. But what we are able to do is provide the *opportunity* for these elements to emerge and ensure the robustness of objects to allow their adaption to human needs and changing desires.

This notion of opportunity is important with respect to learning design and one that all teachers will recognise instinctively. Opportunities for small learning events happen all the time in any classroom and the reactive teacher makes use of them constantly. It is argued that emergent and complex opportunities are required to engender this in learning place design. Alexander's 'city units' or what Schön (1987) terms the 'right

sorts of experiences' are both examples of emergent conceptions relating to place. They cannot be predicted entirely but the opportunities themselves can be tacitly encouraged by the virtual architecture.

There is a difference, then, between thinking that you have created 'place' and knowing that you have only provided the opportunity for it to emerge.

3.3 The destination

Education can be argued to rely entirely on the generation of conceptions - not simply the transfer of facts, and that is especially true for design education. In fact, information transfer is arguably the least part of the education of a designer. Whether we call it Problem Based Learning, Constructivist Learning or Personal Learning Environments, they focus on the generation of conceptions in the mind of the student. The transfer of information is of a lower priority to how that information may be applied or how meaning may be derived from it.

It is worth noting that this is not limited to virtual worlds and is certainly not new - despite the latest names or acronyms. We can all reflect on physical learning events that have stayed with us throughout our lives and might recall a specific teacher at school, a particular subject (or even concept) and certainly the sense of place of that interaction; a provocative question posed in a lecture theatre and the spectacle of challenge and explanation. It is argued that these types of memorable events, are the phenomenon or conception that is the thing remembered.

A virtual and physical example is provided by Jornet and Jahreie (2011) where the entire design process was driven by the desire to create 'place' and acknowledging the complexity that is embodied in such a term. Interestingly, the authors recognise and actively take advantage of precisely this difficulty, considering the design process in the project study as a "learning process". This affirms what many designers know intuitively - the process of design is one of incompleteness where discovery and emergence are essential. But in this particular case study it was essential in both defining the shared conception and resolving its designed solution.

A similar argument is made by Jones (2011), where the generation of the conception in architecture and online learning design is advocated to be the primary consideration for designers of those environments. Clearly, the conscious design of richer learning environments (physical and virtual) requires much more than simply providing the building components alone.

4. 500 students in a building

4.1 Welcome to YOUR building

The Open University course U101, *Design Thinking: Creativity for the 21st Century*¹ is based firmly on design education as 'reflection-in-action' after Schön (1987) as well as design thinking principles in general (Lloyd in press). As such, it deals with difficult concepts and issues, such as uncertainty, creativity and personal development. Over three years of running the course it is clear from student feedback that there is a significant emotional attachment to the experience of learning - both positively and negatively.

¹ <http://www3.open.ac.uk/study/undergraduate/course/u101.htm>.

On the one hand there are students who reject the course completely, struggling to come to terms with the ideas, activities and learning intentions. This response is usually initiated early in the course when students first come across ideas that are contrary to their world-view. For example, the playful nature of early activities is intended to instigate a simple cognitive response in students: thinking through doing (Schön's 'reflection-in-action'). The nature of these activities can be seen, by some students, as trivial and without any value or meaning to them personally. The personal reaction of these students is one of confusion, irritation and even anger, strongly suggestive of Relph's 'outsiderness' of place (Seamon & Sowers 2008).

On the other hand, there are those students who respond to these activities in the opposite way - extending them to mean something personally valuable and taking far deeper lessons from them as a result. The phrase 'life-changing' is one that is encountered in feedback from these students, and is equally suggestive of Relph's 'insiderness' of place.

In both cases, there is clearly a personal and profound reaction to the material presented that has an emergent quality. The challenge for designers of places of design education are significant with respect to this aspect of place - to generate place that allows the change of thinking required. From experience in developing the educational environment for U101, it tends to be the little things that really matter in this respect and, like place itself, these are varied, complex and very difficult to articulate.

For example, the tone of learning content, attitude towards student interactions, and even the graphic design of course elements are all thought to play a part in setting an overall character of the education. Indeed, one of the central learning elements of the course is the personification of a conception of design thinking - that of creative and analytical thinking, represented by two characters, Lola and Sam respectively. The fact that the identity of the module generated by the course code logo also happens to spell Lola when turned through 180 degrees further reinforces this conception in many students. This conception in itself leads to students referring to the course itself as Lola and even themselves as 'Lola-ites'. The identification or projection of the personal in this way indicates that a more valuable transaction is taking place between the student and learning material.

4.2 Find your way around

The cognitive, spatial map of U101 is central to its operation. When Alexander's 'network' elements are considered with respect to student use, a complex structure appears behind the larger, simple one. Online content can be very linear in structure simply because we tend to only view one discrete element at a time and this can be particularly true of traditional content. With the rapid development of web 2.0 technologies, the interleaving and connectedness of these elements has taken a huge step forward. The difference is not simply one of doing away with linearity, it is one of introducing Alexander's 'semi-lattice' structures by allowing dimensions of relationship to form (recommendations, trending, networks of attention).

U101 makes use of a range of these elements in a particular way that breaks up the linearity of mode (or medium) of communication. A piece of written content, for example, is 'interrupted' by a video considering a particular aspect, or is followed by an activity that requires the student to act in a different mode of thinking; or embeds a portal to another part of the environment. The key feature here is that the content is of a particular granularity and complexity that encourages a diversity of activity which leads to an emergence of richer learning events.

This will be of no surprise at all to any teacher of design - precisely the same rich events are the very reason for the design studio. They are the material artefacts that make up Schön's 'right sorts of experiences'. It is perhaps this blend of complexity discovered through a simple 'map' that allows this to take place.

4.3 Make yourself at home

In design education specifically, Schön refers to the 'place of safety', meaning the studio as a place where the student can feel secure in the knowledge that they may try things without the fear of failure (either physically or psychologically). This is an essential aspect of learning the practice of design, where failure is a valuable part of the process. Engendering this as part of an educational environment is more to do with people, psychology and social 'events' than the simple physical space or layout itself. It is also important for the space not to reinforce feelings of failure by making navigation and wayfinding difficult or to generate a feeling of exposure beyond which the student feels uncomfortable.

This last point about exposure could be applied to the architectural and urban design concepts of private/public space, where the degree to which we feel enclosed or exposed, isolated or connected is considered. It is argued that the individual elements provided to support learning on the course generate complex overlaps of place, allowing students to identify with elements that are private (their relationship with their tutor and the activities that provide this), semi-private (relationships formed with particular students across specific places), semi-public (activities at a tutor group level in particular places) and public (activities at course level in particular places). The social networks formed by students in the course are complex and future research will look at these topologies.

A key aspect of the emergence of these 'layers' of place can be found in OpenDesign Studio (ODS) an online design studio specially developed for U101 – see Lloyd (in press) for further details. Although designed as a key element of the course, what was surprising was the reaction and engagement of students within this place. Tutor feedback from several module presentations confirms that students' interaction with ODS is significant, meaningful and, more importantly, was far greater than anticipated. A genuine personal relationship is generated between students and this environment and it provides critical places within which they can begin to present and enact their ideas as design thinkers.

Schön's place of safety is provided here and it is not simply achieved by functional elements. The materials that support students to use it are all carefully designed to engender this sense of place through behaviour, approach and attitude as much as navigating the space itself. The interaction between students is what makes this a place, indeed what makes it a place at all.

This emergence of behaviour and interaction generates something that is greater than the simple information being presented. This in turn leads to a range of alternative tuition opportunities and experiences - both between students as peers and between tutors and students – further enriching the place that is created.

4.4 Apologies for any inconvenience...

A key feature of U101 is the fact that it is entirely online, blending learning content that actively changes to react to students' needs and behaviour. In many ways, it is an incomplete construction – just as real world buildings rarely remain the same throughout their lives.

In architectural design, the need to allow for emergent or unpredictable human behaviour has been long understood. The classic example is providing 'blank' ground to allow people to create pathways which are then created permanently. Of course, as soon as such pathways are created, further shortcuts are always found by the users of these spaces. Our constant reuse and repurposing of our physical environment is one that can be easily replicated in an online environment. This type of emergent behaviour is found in the planned places of the course, such as ODS and the forums but it also occurs at a larger scale, introducing possibilities of more complex 'crowd' behaviours.

Students on U101 are encouraged to find problems with the course and, more importantly, come up with solutions. A trivial example would be the reporting of broken links where a student might discover the problem and then come up with alternative sources. This is often followed by a discussion about the relevance of the content, what is actually intended by it, and ultimately change to the course itself. But the fact that students can then see that their ideas and opinions are taken account of, and that this is then acted upon in changing the course, means that they now 'own' a part of that place. They are not simply inhabiting it – they are creating it.

5. Conclusion

We have repeatedly come across research that struggles with the articulation of a definition of place without resorting to the intangible and descriptive - inferring and relying on the fact that the reader *understands* what is meant without *articulating* what is meant. Deliberate place creation, it seems, is not something that is predictably possible through particular, prescriptive elements of design. Rather, it seems to depend on descriptive, intuitive and process-oriented acts of design.

We have considered several elements that seem to allow place to emerge and these notions of place are not simply defined by their physical or literal characteristics. In each one, the proper sense is only achieved by considering the meaning and value that is brought by the users of those notions and we find that they are dynamic and emergent qualities. Using a language of design, in this case architecture and urban design, it is possible to conceptualise these elements and use this discussion as a basis for the design of such places. The language of design is as much about the *process* of design as it is the object designed. By engaging in design thinking as process we are able to take into account much more than the object of design itself, allowing the emergence of genuinely meaningful places of education.

One of the mistakes that can be made in design is that we assume the object designed is complete at some particular point. But the lesson of our built environment is very much the opposite - the design process continues as the new house owner creates a home: converts space to place. The endless iterations of personalisation, adaption to circumstances or simply responding to our physical needs continues long after the original designer has left the building.

Ultimately, what we seek in education is this continual development of conceptions of place, where we enable the same embodied understanding that allows us to conceptualise which way is up. Bachelard (1984) claimed that the home was a place of dreaming, an essential place for the mind as much as the body. Surely the place of learning should be no less important.

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