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Identifying and Locating Frames of Reference to inform the Design of Virtual Worlds in Higher Education

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1. Abstract

In the changing context of higher education a series of pedagogical shifts have occurred and with them a number of interactive learning approaches have emerged. Learning in immersive worlds (simulations and virtual worlds such as Second Life) has received significant attention, but to date the impact of virtual world learning on higher education remains relatively under-researched. This paper will draw on 3 distinct but interrelated funded studies that have explored the socio political impact of virtual world learning on higher education, with a specific focus on Second Life (SL). It will argue that there are multiple frames of reference which inform the design of and response to virtual worlds as learning technologies. Such frames of reference were evident in the practices of those involved in using virtual worlds, but have largely been over-looked in the literature in terms of their impact.

2. Introduction

Although the higher education landscape continues to change and evolve there is still relatively little data that indicates how tutors make pedagogical design decisions and what impact this may have on students. This paper will draw on 3 distinct but interrelated funded studies that have explored the socio political impact of virtual world learning on higher education, with a specific focus on Second Life (SL). It will argue that there are multiple frames of reference which inform the design of and response to virtual worlds as learning technologies. Three particular frames of reference have been found to be evident across the studies, and they provide the focus for this paper, namely:

- Understandings of games and gaming media
- Disciplinary values
- Institutional space and ownership

We have drawn upon O'Donoghue's interpretivist position on '*perspective*' in our use of the term 'frame of reference' (O'Donoghue, 2007 p. 26). However, the stance we have taken is to use the notion of 'frames of reference' as a lens through which it is possible to see the impact of different stances, approaches and beliefs on the use of virtual world technologies in higher education. Further, such frames of references may, or may not change in the light of experience. Taken together, we assert these frames of reference inform understandings of the variation in approaches taken by students and tutors when using immersive virtual worlds, which, in turn, inform decisions made about learning designs and pedagogic response.

3. Literature

Over the last decade there has been much criticism about interactive media environments that fail to create effective settings for learning (Noble, 2001; Reeves, 2002). One of the reasons for this has been because the focus in interactive media environments has been on technological rather than pedagogical design. Although there is a range of literature that reflects diverse disciplinary use of immersive worlds (as exemplified in Savin-Baden, 2010) there are few expositions of the complexities of the use of SL or indeed transdisciplinary research studies. Yet other studies might be overlaid to help our understanding of the use of SL in the disciplines. For example, Jenkins & Zetter (2003) argue that disciplines shape the nature of pedagogy and such pedagogies reflect the practices and culture of the discipline. In addition, Trowler & Trowler's (2010) recent review of the literature brought together three reported dimensions of student engagement in relation to learning, identity and structure and process. However, there does appear to be a decontextualisation of teaching methods and technical developments from both the learners and the disciplines resulting in a worrying trend towards ignoring the particularities of teaching in a given discipline (Becher & Trowler, 2001), along with the assumption that teaching and learning are necessarily the same thing.

By contrast, engaging in learning and play has been recognised in both schooling and higher education as being useful for encouraging effective learning (Dewey, 1938; Bruner, 1991; Gee, 2004). Games such as the Quest Atlantis Project (Barab, Dodge, Tuzun, et al., 2007) a 3D game for children, and the River City MUVE (Galas & Ketelhut, 2006) have embraced play as a central component of learning. The paper examines the ways in which particular frames of reference relating to immersive virtual worlds might affect the way we approach learning design in higher education. Specifically we investigated the following questions;

- How do frames of reference articulated around gaming and virtual worlds influence expectations and engagement with SL?
- What disciplinary influences are prominent in the use of SL?
- How do tutors' perceptions of ownership of space inform approaches to pedagogy?

4. Methodology

The three studies have each adopted the use of different methodologies which remain soundly qualitative. The range includes case study (Simons, 2009), narrative inquiry (Clandinin & Connelly, 2000), and modified grounded theory (Charmaz, 2006). Whilst separate in their study design, examples of data from the three studies have been brought together for the purposes of this paper to form a 'synthesis' through an interpretivist lens. Thus both the experiences and structures reported upon by research participants have been examined in context. This synthesis of such accounts has demanded naturalistic approaches to the translation of field data and emerging concepts from the individual studies into one another, thereby evolving overarching concepts. We have termed this process *participatory action synthesis* (Wimpenny and Savin-Baden, forthcoming), which is presented in more detail below.

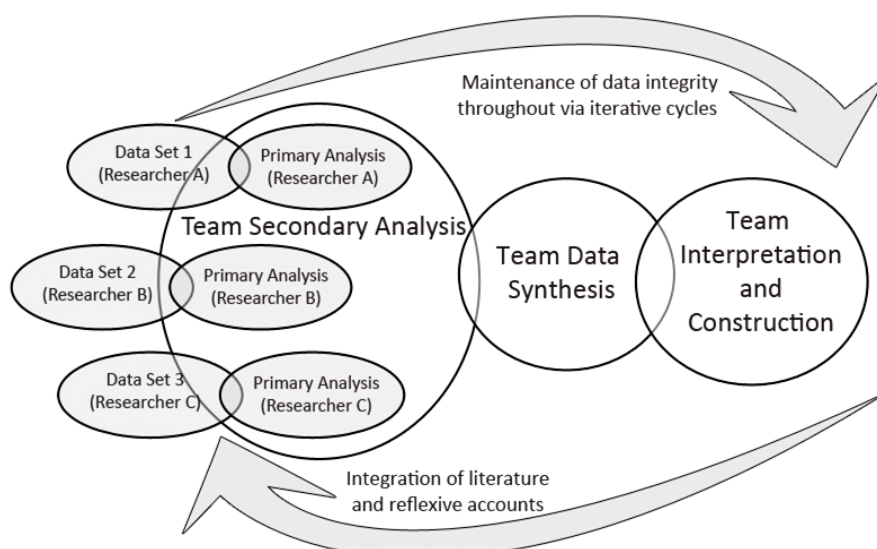
4.1 Data collection

Data were gathered by three PhD students, through individual and group interviews with students, tutors and known experts over an 18 month period, from diverse research sites across a variety of disciplines subject areas, including the arts and humanities, computing, professional education and employability.

Data analysis, synthesis and interpretation

The participatory action synthesis process involved simultaneous phases of data collection and inductive approaches to analysis, building on the process of reciprocal translational analysis (RTA) as outlined by Noblit & Hare (1988) and further adapted by Sandelowski & Barroso (2007). Figure 1 illustrates the process used to locate knowledge gaps by making connections between findings and themes, moving beyond breaking down, reassembling and describing the findings to offering new forms of representation, contextualised by the literature as suggested by Major & Savin-Baden, (2011).

Figure 1: Process of Participatory Action Synthesis



Ethical approval

Approval was granted through research ethics at Coventry University and renegotiated with all other university research sites. Research integrity has been assured through researcher reflexivity and trustworthiness throughout the study.

5. Findings

The findings presented here reflect the frames of reference that emerged through the participatory action synthesis. It should be noted at the outset that these 'frames' were not imposed on these data, but rather emerged as issues of tension and troublesomeness across the studies. Whilst there are other cross study themes it is these frames of reference that appeared to be most poignant and are therefore presented here.

5.1 Understandings of games and gaming media

Within our data at least seven unique reference points related to digital games emerged, including:

- console first-person shooters (FPS),
- online FPS,
- beat-'em-up/fighting games,
- online casual games (for example. Facebook games),
- role-playing games,
- simulation and world builders
- virtual world platforms (both gaming and metaverse).

The disparities between the norms, standards, and expectations drawn from these frames of reference can be stark, and what is *translated* from digital games to virtual worlds by individual participants can be diverse. Frames of reference may, for example, influence expectations of behavioural norms, as evidenced by one participant:

I've only ever played games when you beat people up. So someone would be in front of me and I'd be like 'oh, how do I hit them, how do I hit them?!

Here the individual's previous gaming history is rooted in a specific *type* of game (a beat-'em-up), where behavioural norms (such as hitting) are quite specific. Translating this behaviour into the virtual world of SL was therefore problematic. Not only were there disparities in systems of action (i.e. *how* to hit someone), but such actions carried differing significance within much of SL compared with a fighting-oriented digital game.

Frames of reference were also evident in participants' estimations of personal competence:

I used to play Sims, but I was never good at it...and so, when they were, like, 'oh, you're going to be able to build a set and you're going to', I was, like, 'oh, (expletive) it's like Sims!'. And it was, it was just daunting to think that, like, I was going in this place.

Here a digital game frame of reference (The Sims), influenced both the expectations of action in world, and the participant's perceived personal competence at successful completion of those actions. Previous experiences with The Sims appeared to have *lowered* this student's confidence in the possibility of a positive engagement with SL. The sense of anxiety evident in this quotation highlights how a gaming history can affect motivation and self-belief.

In addition to the diversity in the types and the ways in which digital games affect engagement with the virtual world, we found virtual worlds were positioned by participants in a variety of ways. For example, as digital games, non-games, a replication of the physical ('real') world, an augmentation of the physical world, or a distinct and separate fantasy world. The link to digital gaming was sometimes made explicitly: I was probably one of those people that, prior to the course, that was guilty of thinking that Virtual Worlds were just games effectively.

In this case, the 'game' as a frame of reference is applied to understand the virtual world. The use of 'guilty' and 'prior' were also of significant interest here, in that it indicated a shifting of perspectives between frames of reference i.e. away from games towards other possibilities. This shift was observed amongst numerous participants who began from this position:

Well, I keep saying RPG [role-playing game] because I do see Second Life as an RPG to some degree. Um, it's not a game, I know that, I'm very aware of that, but it is in that same category.

Yet here the continuity between digital games and virtual worlds is less clear. From a cognitive perspective what we are seeing here is the individual locating the virtual world in relation to their cognitive frame of reference, and trying to make sense of it based on prior learning and experience (Ausubel, 1975).

It became clear that frames of reference were particularly murky at the interstices between gaming and non-gaming media, and fantasy and reality. The virtual world can be part chimera (like a clone: Friese, 2010) and part shapeshifter (potentially like its users: Savin-Baden, 2010); a positional conundrum. Such frames of reference at an individual level were also affected by the particular disciplines in which virtual worlds were being used.

5.2 Disciplinary values

By use of the term disciplinary values we mean not only the impact that learning disciplinary knowledge, skills, and behaviours has on learning and teaching, but also the way in which disciplinary traditions and beliefs affect what it means to learn within a given discipline.

The findings indicate that initially students did not understand what and how they were expected to learn when using SL. For example, individual frames of reference appeared to draw upon pre-existing images, knowledge, and experience of the particular discipline that may or may not be relevant. What is of note here is whether tutors are able to help students make connections between complex subject matters and constructive ways of learning in SL, especially if tutors themselves are uncertain of the learning technology, which may require a radical transformation of their practice (Kalogiannakis, 2004). In our data we found students and tutors framed their experience alike, in that they were not able to make sense of SL use intuitively. Some showed signs of reservation or resistance, as commented upon here by a designer for e-learning:

Prior to this I'd tried it out at home on the PS3 for kind of five minutes; I tried Second Life for minutes and kind of run away screaming 'this is just rubbish!'

Whilst this varied depending on the individual and level of the course, there was a tendency for an enhanced and applied understanding to emerge as students became more familiar with the application – as demonstrated in this quote from a rather sceptical environmental management student:

But it was definitely better than I thought, easier than I thought. Although yeah, in the beginning I thought ... this is rubbish, I'm not going to learn anything from this and that changed. [...] They're not going to make us do anything that's going... that's going to have benefit or use. So yeah, definitely changed my mind on that.

Here we see a clear link between the use of SL and the values implicit in the discipline: team work and presentations, for example. Yet in contrast the framing of experience shared by a performing arts student suggests more of a struggle to make disciplinary links:

I was a bit like 'that's, that's not theatre!', but then, I was left working with it for a while and that was it, it is, it's, in its own little way, it can be used as a performance tool, as well as a lot of other things.

What became apparent by such frames of reference was that the use of SL did not provide immediate disciplinary 'fit'. By this we mean that when students came into these learning spaces, they did not immediately recognise the disciplinary shape of them or were able to marry them with previous experiences of disciplinary values and discipline-based pedagogy. However, there were examples demonstrating a clear fit between disciplinary values and the use of virtual worlds. One example was the use of SL to simulate a disaster scenario for environmental managers. Here the potential benefits of SL were clear; a SL simulation provided a safe, but complex space for trainees to practice their future professional roles, and the transferability of the training 'into the real world' was obvious. As two students acknowledged:

SL was a good starting point. Great to try things out first before doing it in reality. It's safe preparation for placement, I'll be able to bring some skills in and try them out again.

(It) was a bit like a role play, because we don't get to do any kind of practical things really, or that many, so as it was, it was a good kind of tool to use, where we could actually put skills into practice without actually physically having to go and do it and we've got not anything like that, so that was, that was really good.

SL was framed as a space that provided opportunity for the development of disciplinary values and capabilities (such as 'soft' skills practice, building, designing) within a specific discipline, yet as Savin-Baden (2008) argues, does it also provide scope for the level of critique necessary for life and work? Tutors and students tended to build and visit spaces within SL that reflected their discipline, and such spaces were designed within disciplinary assumptions. Yet our data also suggested that the intricacy of how disciplinary values may be conveyed requires more thoughtful consideration. Immersive worlds offer possibilities for, and the desire to do things differently, whilst also confirming and imbuing a sense of disciplinary values. Yet at the same time understandings of games and disciplinary values are also affected by the institutional spaces into which they are placed, and it is this we next explore.

5.3 Institutional space and ownership

These findings were drawn from interviews with tutors involved in teaching in SL, and they represent the complex understandings of ownership that frame the rationales and approaches to the use of SL. As Temple (2008: 239) notes, the university's use of space is intimately connected to the student learning experience and thus the implications of spatial practice should be closely considered. We suggest that as new spaces emerge in higher education (such as virtual spaces), they must be shown the same regard. Here we draw upon Lefebvre's (1991) notion of (social) space; specifically space as a means of control, through which some understanding of ownership is developed. Lefebvre's constitution of spaces, along with territorial, disciplinary and institutional spaces impact on learning spaces by preventing or enhancing the development of creative spaces, yet an understanding of the diversity and complexity of learning spaces can also inform the ways that they are (re) created, managed and owned.

At least five different reference points emerged from our data regarding the perceived 'ownership' of SL:

- Student-owned social space
- Student-owned learning space
- Practitioner-owned replicated classroom
- Institutionally owned extension of the campus
- Institutionally owned marketing space

Tutors often viewed SL 'islands' as encompassing multiple frames of reference, thus precluding an easily discernible notion of ownership; drawing again on Lefebvre, understandings of distinct ownership seemed to relate to the 'everyday life' and spatial practice. For example, spaces between people and places are important learning spaces. Lefebvre (1991) suggested social space might be seen as comprising a conceptual triad of spatial practice, representations of space and representational spaces. Spatial practice indicates the way in which space is produced and

reproduced in particular locations and social formations. Yet in the context of SL it would seem that such a formulation of space has created different and diverse spatial zones along with imaginary geographies. For the purpose of this paper, two distinct but interrelated frames of reference are delineated: SL as a student owned space, and as an institutionally owned space.

Assumptions of institutional ownership in SL have often been related to the representation of space and the re-creation of physical university buildings (for example, Savin-Baden, 2010). However, as representations of space have altered throughout SL's lifespan, assertions of institutional ownership have altered. For participants in this project, the framing of SL as an institutionally owned space often related to the level of control exerted by the institution. The structuring and formalising influence of the institution through these processes was also recognised, as exemplified by one tutor:

It's somewhere where you get that nice crossover between the informal and the formal... You know, it's one of those places where you can see the bringing together of those two spaces.

Here, SL was framed as a space in between the formal (the institution) and the informal (social media); as a way to bring the two spaces together. However, the control and authority implicit in this quote are initiated by the educator. Intricate understandings of ownership are thus indicated, implying an ease of unity which we suggest does not exist in practice, (where routine and ritual prevail). Exploring perceptions of student ownership represented a range of complexities, two examples of which are now considered.

The use of SL as a way to engage with students in a 'shared', informal space was often promoted by staff. However, for one tutor, his students' social use of SL was perceived to be a key factor in safeguarding *their* ownership as opposed to the institution's ownership and control:

But when [students] go down to the student union bar then, well that's fair enough, they can do what they want to do. They might be chatting about the learning stuff, discussing assignments - that's their environment, their space, and that's what I think of Facebook as being like. And in a way that's what I think of Second Life as being like. It's that it's not a space that we can intervene in too forcefully, or interfere with. You know, it's fine for [tutors] to pop in every now and again, but - a sense of ownership I guess it is, over different environments.

The comparison of SL to the student union bar and to Facebook (seen as both learning and social spaces, but definitively student-owned spaces), for this participant, was seen as demanding a 'light touch' from the institution. Students did not actively exert control or authority in the claiming of SL as 'their' space; rather, this was seen by this participant as being the institution's responsibility to ensure it did not encroach on that ownership.

An alternate view of ownership emerged through the use of islands other than the educator/institution-owned space for learning. These were often referred to as "field trips", thus automatically situating these SL spaces as owned by another. However, it also represents a further claim to institutionally owned space. The discursive construction of a field trip automatically presupposes that there is a space to leave that is *not* a field trip. In terming the visit to another island's space as a field trip, their own institutional island becomes the SL 'home' from which they leave and to which they will return. Yet for one tutor working in a science-based discipline, the use of other SL islands was perceived as a challenge to student ownership of space and of learning:

I do feel that the eye candy aspect of SL can lead to a degree of "tourism". I want... to get students to modify the environment. To achieve their own ends... So it is important for me that they generate physical artefacts.

Here, student ownership of the SL space is supposed through the creation of the objects and the modification of the environment. Framing ownership in this way meant a move away from the ownership of physical space as discussed thus far (ownership of their SL island, ownership of the SL technology as a whole) and establishes ownership as the enactment of spatial practices in Lefebvre's terms. When ownership is perceived in this manner, students can own any SL space in which they can build, for example: public sandboxes, their institutional island, and the sandboxes of other institutional islands. Whereas ownership has largely been understood in terms of the formal

(institutionally owned) and informal (social media/student ownership) values attributed to the space, for this participant, were a means of ensuring student ownership through creative learning processes: 'achiev[ing] their own ends'.

6. Discussion

In the following section we move on to discuss how participants multiple frames of reference served to influence and inform virtual world design. Firstly we contend that a continuity of frames of reference between digital games as a media and virtual worlds as a media cannot be assumed. For example, some participants viewed virtual worlds as a type of game, whilst others held alternate positions and meanings, and understandings were not necessarily *translated* in straightforward ways. Therefore it is not easy to predict what influence on action emerges from the positioning of virtual worlds as akin to (or actually as) games. The framing of virtual worlds that influence actions are neither determined wholly in isolation of pedagogy and engagement in higher education, nor solely by that engagement. This in turn raises questions about the relationship between disciplinary values and virtual worlds, which we now discuss.

There are few expositions of the complexities of the use of SL in disciplinary research studies. These findings indicate that students struggle to see the disciplinary relevance of their learning in SL, and staff do not always realise the impact of discipline-based pedagogy on their use of SL. The result is that individually held disciplinary assumptions result in students holding different positions regarding professional understandings, which are not translated in straightforward ways. Although the play elements and visual stimulus of SL is explored in the literature, what remains relatively hidden is the potential for SL to project disciplinary understandings, enabling students to see its relevance for their subject field. We contend that tutor confidence, knowledge and skill in using SL within the disciplines are key. Whilst not directly related to SL, studies such as Kalogiannakis (2004) demonstrate the value added when social support networks are used to support tutors in their role to effect the diffusion of technology within a profession. Further, what is important to consider when designing virtual world learning is not only knowing 'how to do it' in SL, but also how to do it in *new* ways in SL, and under which circumstances, and how this can affect the way that students learn particular subject matter. Shulman's (2005) work on signature pedagogies can be applied here in terms of considering 'surface level interaction', or the working principles, employed by the tutor to enhance learning, to give students good reason to be part of the learning community, to ensure learning expectations are explicit and responsive and foster social connections. If disciplines shape the nature of pedagogy and such pedagogies reflect the practices and culture of the discipline, how can use of an immersive learning environment influence teaching practices and the methods by which future practitioners will be educated for their profession?

Finally suggest there is a tension between designing learning for the disciplines within SL, which makes best use of its creative space, capitalising on the one hand a sense of novelty and surprise, (Jankowska and Atlay 2008), whilst being aware of expectations and reference points for the learner. As Savin-Baden (2008) identifies, the opportunity to do things differently when designing learning for the disciplines within SL, where there is less order, forces a reconsideration of how learning spaces are to be constituted. Further, understandings of ownership play a role in how practitioners perceive virtual worlds as learning technologies and how this can influence the design of pedagogy within it. Yet the balancing of SL as a social space and SL as a learning space include issues of ownership. Within the study ownership (and associated themes of implied control and power exertion) emerged as a complex frame of reference which differed from individual to individual, and characterised different aspects of SL. Such a range of perspectives in turn raise questions about what is allowed and disallowed including how tutors may seek to control and contain space. For example, SL was viewed as an institutionally owned extension of the campus, as a replicated classroom and, or as a useful marketing feature. Such perspectives were due in part to the design of the space, but arguably were more a reflection of views of ownership framed by self-positioning. Our data revealed how one tutor framed SL as offering a useful crossover space in which to bring together social media and the institution; in other examples we see SL as being framed as a type of game, or, seen as both a learning and social space, but definitively a student-owned space. Our findings demonstrate a tension expressed by tutors who seek to push boundaries of structure and appearance, and encourage students to make use of SL spaces, yet also want students to get something from their learning, in ways they perceive to know best.

7. Conclusion

This paper has examined frames of reference relevant to the design and experience of virtual worlds in higher education. This participatory action synthesis suggests that previous explorations of learning in virtual worlds in the research literature have neglected to look more closely at frames of reference and how these serve to inform expectations. Whilst not always deleterious, there is potential that frames of reference may interfere with, and or collide with each other, with interesting consequences during the student / tutor encounter. Of further note is how frames of reference are reconceptualised temporally, thus in the (re) configuring of perspectives how will learning designed within virtual worlds respond.

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