Reviewing Perspectives on Virtual Worlds

The phoenix, the symbol for Coventry University, is a mythological bird that represents rebirth, self-creation, opportunity and abundance.

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Preface

Katherine Wimpenny

Under the direction of Maggi Savin-Baden, the Learning Innovation Research Team, based at the Enterprise Centre, Coventry University Technology Park, has been researching the socio-political impact of virtual world learning on higher education, funded by the Leverhulme Trust.

This four year study, known as the CURLIEW project (Coventry University Research into Learning in Immersive Educational Worlds) has been examining staff and students’ conceptions of and decisions about the ways in which they teach and learn using virtual worlds.

This publication, written by staff and students in the research group, provides an overview of the way virtual worlds are being used for learning and teaching in higher education. It unpacks, explores and makes sense of a number of themes which have emerged during the course of the study. Although not offering a comprehensive resolution, it does suggest which issues need to be considered now and those which will be important in the future. This review is presented to researchers and practitioners who are new to the use of virtual worlds in higher education, as well as offering suggestions for development for those who have already adopted it.

We have been delighted to support this project at Coventry University. We see both the developments in Digital Media and the new technologies being refined within it, as exciting opportunities and as great challenges for our society – not least in all aspects of education and training. We need to bring experimentation, analytical rigour and conceptual clarity to this field – I know that both the work generously funded by the Leverhulme Trust and the dissemination of its outcomes will contribute to this intellectual requirement – as will the sharing of practice and discussions at the conference.

Further Information

cuba.coventry.ac.uk/learninginnovation
cuba.coventry.ac.uk/leverhulme

Foreword

I am very pleased to offer a foreword to this literature review entitled “Reviewing Perspectives on Virtual Worlds”. It is one component of a number of outputs from the four year Leverhulme Trust-funded study that examined the socio-political impact of virtual world learning on higher education. Coventry University is a dynamic, global, enterprising university and this project reflects the values of the University, particularly in the areas of innovation and creativity in teaching and learning.

The main focus of the study undertaken by the Learning Innovation team has been to examine the educational implications of using virtual worlds and analyse the impact on staff and students. This literature review illustrates that there is still little understanding of the ways in which virtual worlds are employed for teaching in higher education, and, as a result, use across the sector is varied and inchoate. The variety is due to issues such as the complexity of relationships between real and virtual spaces, and the inchoateness emerges from a lack of clear educational policy or pedagogical thought in relation to new technological developments. This lack of clarity impacts upon the student experience when learning in virtual worlds and on the ability of staff to design programmes that reflect learning for a complex world. This document examines the literature and provides useful pointers for those considering how to use virtual worlds in higher education, as well as offering suggestions for development for those who have already adopted it.

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Professor Madeleine Atkins
Vice-Chancellor
Coventry University
The Authors

Maggi Savin-Baden
Maggi is Professor of Higher Education Research at Coventry University, and Director of the Learning Innovation Applied Research Group. Maggi’s interest in learning and research methods has been the focus of her research for many years. To date she has published 10 books, over 40 articles and 18 book chapters. She has recently completed an MSc in e-learning at The University of Edinburgh and just finished her 11th book on Qualitative Research Methods.

Cathy Tombs
Cathy is a research assistant in the Learning Innovation Applied Research Group and has supported the bringing together of this publication. Her role within the team is varied, and ranges from undertaking qualitative data collection and analysis, designing and developing learning scenarios within the virtual world Second Life, maintaining the group websites and blog, designing marketing materials and organising events. Her most recent work involves developing virtual medical simulations with the University of Texas Arlington in the US and the North Western Medical Deanery in the UK.

Katherine Wimpenny
Katherine is a Research Fellow within the Learning Innovation Applied Research Group. She has had responsibility for bringing this document together and editing the piece as a whole. Katherine’s role within the CURLIEW project is to synthesise the qualitative data across the study. She is a member of the supervisory team for each of the PhD students, involved in writing scholarly articles, enhancing the research capacity of the research group and its funding base. She has recently gained funding to conduct two qualitative research syntheses.

Maggie Steils
Nicole is a PhD student on the CURLIEW project at Coventry University. Her research concentrates on the impact of teaching in virtual worlds on notions of learner identity. She is also interested in how students and teachers communicate, cooperate and resolve conflicts. Qualified as a secondary school teacher, she has worked in out-of-school education as a training advisor and facilitator for over ten years. Additionally, she has lectured in education at Goethe-University, Frankfurt/Germany.

Gemma Tombs
Gemma is a PhD student working on the Leverhulme-funded CURLIEW project. Her case study research focuses on the design of pedagogy for virtual worlds, and specifically how pedagogy and practices are informed by the current socio-political context of higher education in the UK. Gemma has also taught on the Coventry University Second Life Add+Vantage course and enjoys putting insight gained from her research into practice.

Matt Mawer
Matt is a PhD student on the CURLIEW project. His doctoral research explores students’ perspectives on the use of virtual worlds as learning technologies in higher education. Matt is particularly interested in the interaction between virtual worlds and broader networks of meaning in participants’ everyday lives. Prior to the CURLIEW project, he studied BSc Forensic Psychology and MSc Social Research Methods at Teesside University. Matt’s interests also include the philosophy of social science and Science and Technology Studies.

Nicole Steils
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Introduction

Katherine Wimpenny

Learning in virtual worlds such as Second Life™ has received significant attention to date, offering new perspectives to the study of the socio-political impact of learning in higher education. Virtual learning spaces such as Second Life are often posited as open and universal, and staff using them in the main adopt different learning approaches from other existing learning spaces both online and in the classroom (as suggested by, for example, Dalgarno and Lee, 2010; Hemmi, Bayne and Land, 2009; Savin-Baden, 2008a). However, in addition to a lack of clear educational policy, there remain a wide range of issues surrounding the use of virtual worlds. These issues include the categorising of virtual worlds; relationships between real and virtual spaces; understanding students’ values, motivations, and experiences; avatar creation and avatar behaviour; identity and presence in Second Life; and devising effective pedagogical strategies. In the following sections we explore such issues, located in the current literature, which relate to the research studies being undertaken.
1. Categorising virtual worlds

Matt Mawer

The majority of educational applications of virtual worlds in the UK utilise Second Life as their platform of choice. Whilst there is much common ground between the community of educators and researchers interested in virtual worlds, numerous terms are used to refer to the virtual world. It is useful to be mindful of the distinctions between diverse terms and understandings. This section offers an overview of the use of terms that have been adopted and appropriated for virtual world learning.

The plethora of names

It is surprising how often terminology for referring to technologies such as virtual worlds are applied interchangeably or become invisible to the scrutiny of practitioners and researchers. In educational research there has been an abundance of names generated and applied to virtual worlds as Table 1 illustrates:

Table 1: Terms used for ‘virtual worlds’ in education

<table>
<thead>
<tr>
<th>Term</th>
<th>Abbreviation</th>
<th>Author(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi User Virtual Environment</td>
<td>MUVE</td>
<td>Perez-Garcia (2009); Ketelhut, Nelson, Clarke et al. (2010); Heid and Kretschmer (2009)</td>
</tr>
<tr>
<td>Immersive Virtual World</td>
<td>IVW</td>
<td>Savin-Baden (2008a,b; 2010a,b); Middleton and Mather (2008); Dittmer (2010)</td>
</tr>
<tr>
<td>Three Dimensional Immersive Virtual Worlds</td>
<td>3D IVW</td>
<td>Dalgarno, Lee, Carlson et al. (2011)</td>
</tr>
<tr>
<td>Virtual World</td>
<td>VW</td>
<td>Bayne (2008); Boellstorff (2010); Girvan and Savage (2010)</td>
</tr>
<tr>
<td>Three Dimensional Virtual World</td>
<td>3D Virtual World</td>
<td>Lee (2009)</td>
</tr>
<tr>
<td>Massively Multiplayer Virtual World</td>
<td>MMVV</td>
<td>Antonacchi and Modaress (2005)</td>
</tr>
<tr>
<td>Massively Multiplayer Virtual World (user-created)</td>
<td>MMVV (user-created)</td>
<td>Antonacchi and Modaress (2008)</td>
</tr>
<tr>
<td>Three Dimensional Virtual Environments</td>
<td>3D Virtual Environments</td>
<td>Dalgarno and Lee (2010)</td>
</tr>
<tr>
<td>Serious Virtual World</td>
<td>SWW</td>
<td>Bellofi, Berta, De Gloria et al. (2010)</td>
</tr>
<tr>
<td>Three Dimensional Collaborative Virtual Environment</td>
<td>3D CVE</td>
<td>Prasolova-Farland (2008)</td>
</tr>
<tr>
<td>Three Dimensional Virtual Learning Environment</td>
<td>3D VLE</td>
<td>Livingstone, Kemp and Edgar (2008); Dalgarno and Lee (2010)</td>
</tr>
<tr>
<td>Social Virtual World</td>
<td>SWW</td>
<td>Damer (2008); Bell, Robbins and Withnall (2010)</td>
</tr>
</tbody>
</table>

Similarly, there have been a number of more expansive terms which encompass virtual worlds used in education and commercial settings, as illustrated in Table 2:

Table 2: Broad terms that encompass ‘virtual worlds’ in education and practice

<table>
<thead>
<tr>
<th>Term used</th>
<th>Abbreviation</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly Interactive Virtual Environment</td>
<td>HIVE</td>
<td>Aldrich (2009)</td>
</tr>
<tr>
<td>Virtual Environment</td>
<td>VE</td>
<td>De Freitas and Neumann (2009); Schroeder (2008)</td>
</tr>
<tr>
<td>Synthetic World</td>
<td>Synthetic World</td>
<td>Castronova (2006)</td>
</tr>
<tr>
<td>Educational Virtual Environment</td>
<td>EVE</td>
<td>Mikropoulos and Natsis (2010)</td>
</tr>
</tbody>
</table>
Naming conventions

If we explore broader work of educational research then closely related technologies offer more names: serious games (De Freitas, Rebolledo-Mendez, Liarokapis et al., 2010); Massively Multiplayer Online Role playing games (Childress and Braswell, 2006); educational simulations (Aldrich 2009) and so forth. There are two reasons that authors may offer different names for technology. The first reason is the desire for a unique acronym or term that distinguishes their work from the corpus of research. The second reason is of more interest: choices in name may reflect the understanding of the technology held by the researchers. Following that premise, what can examining the name attributed to a virtual world tell us about the assumptions of the researchers?

One useful observation is that terms provide delineations between characteristics that researchers wish to emphasise about virtual worlds. Some names link directly to specific technical characteristics of the technology. A ‘3D virtual world’ relates something of the graphical, spatial and aesthetic qualities of the technology for instance (Dalgarno and Lee, 2010). In contrast, the use of a term such as ‘Collaborative Virtual Environment’ focuses upon the way in which a virtual world may be used as a space of shared action (Prasolova-Førland, 2008). Alternatively, the term ‘Immersive Virtual World’ focuses on a specific type of user experience: being immersed (Dittmer, 2010). Conversely, ‘Serious Virtual World’ seeks to distinguish between those technologies which are ‘serious’ and those which are ‘non-serious’ (Bellotti, Berta, De Gloria et al., 2010). In this latter case the naming of a virtual world as ‘serious’ not only serves to position the virtual world itself, but also to re-position other technologies which occupy a similar space. For example, claiming Second Life to be a ‘Serious’ virtual world, suggests there are other non-serious virtual worlds. Finally, the term ‘Social Virtual World’ distinguishes between technologies designed primarily for social activity and those linked to other activities (Bell, Robbins and Withnail, 2010). The immediate division here is between virtual worlds such as Second Life and online gaming worlds such as World of Warcraft. In each of these cases, the names used to refer to virtual worlds serve to emphasise or delineate traits that are deemed of importance to the researchers involved; for example, collaboration, immersion, seriousness, and sociality.

At a meta-level there are interesting trends in these naming conventions. Three groupings of terms are evident from the research.

1. There are terms that relate to the experience a user will have within the virtual world.
   ‘Immersive Virtual World’ and ‘Collaborative Virtual World’ tell us something about the expectation that a user will be immersed or be engaged in joint activity with other users.

2. There are also terms that relate to the capabilities of the technology itself.
   ‘Multi-User Virtual Environment’ and ‘Highly Interactive Virtual Environment’ indicate the capacity of the virtual world to host numerous participants simultaneously or provide interactive, dynamic content.

3. Finally, there are terms that relate to the purpose or ethos of the virtual world. Here for example, ‘3D Virtual Learning Environment’ and ‘Serious Virtual World’ both convey a sense of what should be done – learning and ‘serious’ action respectively.

Whilst there is some common agreement over the technology in question, it is evident that exactly what is meaningful or noteworthy about that technology remains a subject of contention.

Names and their ‘relative’ significance

Names may frame our research and practice. Terms and names serve to weight, position and emphasise certain aspects of a learning technology, often at the expense of de-emphasising other aspects. Each time we prefix or suffix the ‘virtual world’ with a term we are making an assertion about it. There is little doubt that the virtual world is Three Dimensional (3D) when we use the term to refer to Second Life. However, Boellstorff (2010:126) has argued that virtual worlds need not be visually rendered in order to fulfil his definition as ‘...places of human culture realized by computer programmes through the internet’. Can we call a non-visual virtual world ‘3D’ with the same meaning? Perhaps not, and where does this emphasis on 3D virtual worlds leave (now discontinued) Metaplace, which was a 2D platform which shared many traits with a space such as Second Life? Terms that relate to the user experience can be particularly contentious. ‘Immersive’ virtual worlds presume that users will experience immersion, however, research into immersion in Second Life suggests that experiences can be varied and dependent on a variety of factors (see
1. Categorising virtual worlds

Maggi Savin-Baden

There has been an increasing interest in the notion of space in higher education and more recently on physical space. For example, a literature review was undertaken to ‘inform the design of learning spaces for the future, to facilitate changing pedagogical practices to support a mass higher education system, and greater student diversity’ (Temple, Barnett, Voate et al., 2007). The review examined the built environment, the organisational nature of higher education and how universities are governed and managed, including changing relations with their students and factors influencing the learning process. However, there has been relatively little consideration of the ways in which space is seen both as a site of learning and as a site of power, whether in real or virtual spaces.

Understandings of space

Space and spatiality in 3D virtual worlds such as Second Life has a somewhat taken for granted quality about it, that has resulted in a tendency to overlook or ignore, not only the way teaching within it is spatially constructed, but also the impact this has on the spatial norms of learning. Thus it is not entirely clear how Second Life as a learning space affects pedagogical practices. For example, it would seem that spatial norms and practices within Second Life are likely to shape social and pedagogical production.

The control of physical space and the way in which it is valued and represented is evident through office spaces, organisational practices and classroom layouts in both schools and universities (for example, Rogers, 1983; McGregor, 2004). Yet spaces such as Second Life tend to interrupt such practices, and power related to university island space remains largely divorced from university management. Universities and university leadership in particular seem to take little notice of the understandings, formulations and functions of space. For instance, the social architecture of universities tends to represent different ideologies. Yet the control of space, and the way in which it is valued and represented, is evident through timetables, meetings, teaching and office spaces and

2. Real and virtual spaces

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This section explores some of the literature relating to conceptions of real and virtual spaces and suggests that using virtual worlds for teaching and learning should consider the impact of different uses of ‘reality’ on student learning and engagement.

Summary of section

This section has started the process of understanding names and their consequences in terms of:

- The plethora of names used for virtual worlds in the literature
- Naming conventions
- Names and their significance

Understandings of space

Space and spatiality in 3D virtual worlds such as Second Life has a somewhat taken for granted quality about it, that has resulted in a tendency to overlook or ignore, not only the way teaching within it is spatially constructed, but also the impact this has on the spatial norms of learning. Thus it is not entirely clear how Second Life as a learning space affects pedagogical practices. For example, it would seem that spatial norms and practices within Second Life are likely to shape social and pedagogical production.

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organisational practices. This very ordering belies the way that university learning spaces shape not only student learning and staff practices, but the very nature of higher education itself, as Lefebvre (1991) has argued:

Social space is a social product... space thus produced also serves as a tool of thought and of action; that in addition to being a means of production it is also a means of control, and hence domination, of power; yet that as such escapes in part from those who would make use of it. (Lefebvre, 1991: 26)

Lefebvre’s constitution of spaces, along with territorial, disciplinary and institutional spaces impact on learning spaces by preventing 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 and managed.

Virtual and mixed reality

Benford (2009) explored the relationship between real and virtual spaces, revisiting some previous work carried out in order to examine the relationship between the structure of hybrid physical-digital spaces from the fields of virtual reality and mixed reality. What is particularly interesting are the relationships he explores between these spaces, in particular the concept of overlay, as presented in Milgram and Kishino’s mixed reality continuum (1994).

At one end of this continuum lies everyday physical reality and at the other is an immersed virtual reality in which the participant is completely immersed in a computer generated virtual world. The areas in between vary from spaces where the participant primarily inhabits the physical (but working in the virtual could be located here); to augmented reality where the participant inhabits an online virtual world (but which is made live with information from the physical world). This could be the use of Second Life with live feeds in to problem-based scenarios, such as breaking news or weather reports. What we are seeing here is the relationship between adjacency and overlay.

In Second Life the streaming in of feeds and real life data uses overlay, so that this results in augmented virtuality. However, adjacency emerges from the idea of the concept of a mixed reality boundary which is where there is a two way portal between the physical and virtual worlds. Thus:

Participants in a physical space see a persistent projected view of a virtual space on the wall while participants in the virtual world see a persistent live video texture looking back into the physical world. The two are then aligned in such a way (and enhanced with an additional audio channel) to create the effect of a two way window so that each kind of participant can look from their space into the other. Multiple mixed reality boundaries can then be used to connect many physical and virtual spaces into a more complex hybrid structure, in much the same way that physical spaces are connected in a building.

In practice this means that in a physical office it is possible to make it appear to be adjacent to a virtual office; it is as if the virtual office is an extension beyond the screen: they are not overlaid; they are next to each other.

Yet what still seems to be missing from knowing about space in virtual worlds are the understandings of space, spatialization and spatiality in the real and virtual practices and the ways these are played out, and affect everyday activities in higher education. For example, the screenshot captured overleaf illustrates the seating position, taken 30 minutes into a meeting to discuss ‘space in Second Life’. Participants had rezzed chairs in order that they appropriate the space in a way that was comfortable to them. Here the participants represent a Second Life norm of sitting in meetings, which whilst transferred from real life does reflect a spatial practice that has become embedded.
2. Real and virtual spaces

Second Life meeting on Space

Spatial practice, architecture, and design issues connected with synchronicity have been explored to some extent in the (research) literature (for example, see Minocha and Reeves, 2010; the DELVE project; Minocha and Mount, 2009; De Lucia, Francese, Passero et al., 2008). However, what is under reported relates not only to how virtual spaces are designed, but also the assumptions that are made about space and places in virtual worlds in relation to spatial practice. What does seem to be evident is that space is produced by and through performance (Minocha and Reeves, 2010), that there is no one kind of space and that it is constantly mobile.

Possibly then Second Life does not create its subjects as much as the world within which the subject exists (following Lazzarato, 2004). Thus what worlds and spaces such as Second Life might bring are new notions of community and different understandings of space and spatial practices so that leisure, work and home spaces are increasingly hybridised, extended and mixed. Maybe they are the beginnings of what Thrift hopes for in referring for the need for imaging new political spaces: These spaces are not just new maps of getting on together (though they certainly attempt to be that). They are also means of focussing attention, writing wrongs and working through productive axes of transposition (Braidotti, 2006).

(Thrift, 2006: 194)

Summary of section

- Space and spatiality in virtual worlds such as Second Life has been overlooked in the research literature, not only regarding the way teaching within it is spatially constructed, but also the impact this has on the spatial norms of learning
- More consideration is required regarding the ways in which space is seen both as a site of learning and as a site of power
- Mixed reality has been considered as a method for integrating virtual and physical spaces more closely so that physical and digital objects co-exist and interact in real time
- Spatial practice, architecture, and design issues connected with synchronicity need further investigation
3. ‘Digital Native’ theory a decade later

Matt Mawer

The concept of the Digital Native was proposed by games-based learning theorist Prensky (2001a; 2001b) as a reflection, and call to action on the education system. There is substantial evidence indicating that it is utilised, investigated and critiqued in recent e-learning literature (Lei, 2009; Thinyane, 2010; Helsper and Eynon, 2010). Similarly, various uses of virtual worlds in education have included elements of digital native theory to a lesser or greater extent (O’Connell, Grantham, Workman et al., 2009; Duffy and Penfold, 2010).

This section reviews and critiques the concept of the digital native in light of evidence from virtual worlds and learning technology more broadly.

The Digital Native proposition is one that positions students’ values, age, motivations and consequently their experiences, in relating to technologies such as virtual worlds in higher education. In the following section the Digital Native theory is set out and recent literature explored to outline the debate. Given the substantial diffusion of Digital Native theory, it is also necessary to establish some parameters of the review. Analysis here is confined specifically to the main areas of interest in this publication, namely educational technology, e-learning and virtual world learning. There are also a number of cogent theoretical oppositions to the Digital Native theory posited (e.g. Owen, 2004; Bayne and Ross, 2007; McKenzie, 2007) which are not reviewed here. This review will thus concentrate primarily on addressing the implications of research on the relationship between virtual worlds and Digital Native theory.

Digital Native theory

The Digital Native describes an alleged divide in modern society between those born, socialised into and surrounded by digital technology during their upbringing, and those who came upon it later in life. The 1980s is seen as the key decade for this process of digital saturation (Pedró, 2006; Sanchez, Salinas, Contreras et al., 2011), with a generational divide having opened between the Digital Natives born post-1980, and the Digital Immigrants born pre-1980 (Prensky, 2001a; O’Connell, Grantham, Workman et al., 2009). Several claims about the values, strategies and learning styles of the Digital Natives are proposed:

- Are technology focused and driven, incorporating digital technologies into every aspect of their lives (Prensky, 2009)
- Engage with information and activity at a vastly faster rate than their predecessors; preferring to multi-task extensively (Prensky, 2001a; Pedró, 2006)
- Are shaped (neurologically) by their engagement with all things digital, leading to entirely new thought processes and modes of communication that are entirely alien to Digital Immigrants (Prensky, 2009)
- Value collaboration, participation, social co-presence and a networked structure to information (Prensky, 2006; Barnes & Tynan, 2007)
- Are heavily influenced by digital media sources and therefore less engaged with non digital activities (Pedró, 2006; Toledo, 2007)

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There is considerable variation between sources in the attributes that Digital Natives are deemed to possess, however, the orientation of the Digital Natives is effectively summarised as:

…native speakers of technology, fluent in the digital language of computers, video games, and the internet.

(Prensky, 2006: 9)

The concept put forward by the Digital Native theory has gone under various guises, including Millennials (Howe and Strauss, 2000), the net generation (Tapscott, 1998) and the Google generation (Oblinger, 2008). It seems from academic publications that it is Prensky’s terminology which has stuck in the virtual worlds arena (O’Connell, Grantham, Workman et al., 2009; Duffy and Penfold, 2010), and so it is ‘Digital Native’ that shall be used here.

Digital native :
A term originated by educationalist Marc Prensky (2001a; 2001b) to refer to those born post-1980, for whom digital technology has been pervasive in the formative experiences of their childhood and early adulthood

Digital immigrants:
A term originated by educationalist Marc Prensky (2001a) to refer to those born pre-1980, for whom digital technology was not pervasive in their childhood or learning experiences

Millenials:
Terminology from Howe and Strauss (2000), see Digital Native

Net generation :
Terminology from Tapscott (1998), see Digital Native

Google generation:
Terminology from Oblinger (2008), see Digital Native
Digital Native theory and virtual worlds

Virtual world learning should provide an excellent case study for establishing the credence of Digital Native theory for several related reasons. The hybrid of the technical and social in virtual worlds such as Second Life is congruent with the attributes of Digital Native pedagogy (Prensky, 2001a). Virtual worlds utilise an array of digital practices that are adopted as tools of Digital Natives (e.g. Pedró, 2006; Barnes and Tynan, 2007), particularly social networking media. These tools are delineated in Table 3, below:

Table 3: Communication features (Adapted from Ryan 2008:3)

<table>
<thead>
<tr>
<th>The virtual worlds have</th>
<th>Which is similar to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real time text chatting-private</td>
<td>Instant messaging</td>
</tr>
<tr>
<td>Real time text chatting-group</td>
<td>Chat room</td>
</tr>
<tr>
<td>Delayed time text chatting</td>
<td>Email</td>
</tr>
<tr>
<td>Real time voice</td>
<td>VoIP (e.g. Skype) telephone &amp; conference calling</td>
</tr>
<tr>
<td>Real time video stream w/audio</td>
<td>Video calling</td>
</tr>
<tr>
<td>Searchable network tools</td>
<td>Web 2.0 (e.g. Facebook)</td>
</tr>
<tr>
<td>Note card messaging</td>
<td>RSS / newsfeeds / alerting</td>
</tr>
<tr>
<td>Ability to create content</td>
<td>Forum, wiki, blogs</td>
</tr>
<tr>
<td>Record activities for later access</td>
<td>Podcasting</td>
</tr>
<tr>
<td>Uploading documents</td>
<td>File sharing</td>
</tr>
</tbody>
</table>

Prensky (2003) has also noted the ubiquity of Massively Multiplayer Online Games (MMOGs) in the Digital Native generation, and has suggested there is an immediate point of connection with the use of MMOGs in education (Delwiche, 2006; Dickey, 2011). Finally, several virtual world learning projects have already utilised Digital Native theory in their framing of premises or discussion of research results (O’Connell, Grantham, Workman et al., 2009; Duffy and Penfold, 2010; Toro-Troconis, Meenan, Highbam et al., 2010; Burgess, Slate, Rojas-Lebouef et al., 2010). Given the potential resonance between virtual world learning and Digital Native theory, it seems reasonable to expect that if the concept has any significant contribution to make, it should be within this domain.

The evolution of Digital Native theory

As Guo, Dobson and Petrina (2008) note, it is reasonable to assume that exposure to digital technology substantially increased after the boom when personal computing took place during the 1980s (in digitally developed countries, at least). Other academic fields have paid significant attention to the permeation of digital technologies into everyday lives; not least theorists of digital literacy (Merchant, 2007) and multimodality (Kress, 2003). These theorists have also been keenly interested in the development of literacy practices in virtual worlds, both in educational (Merchant, 2009; Gillen, 2009) and leisure usages (Steinkuehler, 2007). Critical commentaries from literacy research regarding the incorporation of technology in the classroom often mirror the disquiet of Digital Native theorists, for example:

...At the heart of this concern is the sense that a whole range of cultural resources fail to be translated into cultural capital.

(Merchant, 2007: 127)

Unlike these considerations of digital literacy, popular uses of the Digital Native theory have exhibited a certain apocryphal and unscholarly quality. Even within peer-reviewed publishing some are prone to uncritical replication of Prensky’s seminal work (Long, 2005; Duffy and Penfold, 2010) and empirically unsupported polemic (Barnes and Tynan, 2007). This has done little to substantiate, disprove or develop the theory. Conversely, critics of the Digital Native theory have been active empirically and theoretically over the past decade. Bennett, Maton and Kervin (2008) offer a lucid deconstruction of the assumptions that underpin the Digital Native concept, particularly the disregard for intra-group differences, they argue:

...a proportion of young people are highly adept with technology and rely on it....there also appears to be a significant proportion of young people who do not have the levels of access or technology skills predicted by proponents of the digital native idea.

(Bennett, Maton and Kervin, 2008: 779)

At the heart of Bennett, Maton and Kervin’s objection to the Digital Native idea is the distinction between ownership and participation in digital technology. Helsper and Eynon (2010) echo this concern, noting that the distinction between ‘doing’ digital activities and the types of people who are involved in these activities have been conflated into a single discourse of young ‘natives’. The product of this conflation is the overemphasis on numeric age as a determining factor of digital literacy, when it is other factors related to age (such as social environment, experience with technology, self-efficacy and so forth) that are arguably of more interest (Helsper and Eynon, 2010).
Digital Native theory and learning in virtual worlds

Some educators involved in establishing a case for the use of virtual worlds in learning have been swift to capitalise on the transferability of practices implied by the Digital Native idea:

The communicative, social nature of virtual learning allows students to demonstrate the skills and strategies they have acquired through utilization of social technology tools. (Burgess, Slate, Rojas-Lebouef et al., 2010: 84)

In these accounts, using a virtual world as a learning technology is premised on the perception that ‘Digital Native’ students will share an affinity with the environment. For instance, Toro-Troconis, Meeran, Higham et al. (2010) comment that their motivation for designing Second Life learning scenarios with undergraduate medical students was the familiarity of their ‘Digital Native’ students with virtual and gaming environments. A similar justification for the development of a Second Life campus for hospitality and tourism management is offered by Duffy and Penfold (2010). After describing their students as Digital Natives, Duffy and Penfold ask ‘…how can we capitalize on the willingness of learners to engage with virtual worlds?’ (2010: 5). Two questions emerge: are learners willing to engage? And, how do we capitalise on that willingness? The former inevitably must underpin the latter, but its answer is assumed rather than investigated because of the reliance on Digital Native theory.

Finally, in an analysis on students’ discourse, O’Connell, Grantham, Wong et al. (2010) utilise a Digital Native theoretical perspective as a lens to data interpretation. This takes Digital Native theory a step further than the design of research and learning spaces, explicitly entering into the analysis of students’ perspectives and experiences of learning.

It is frequently the case that the assumptions of Digital Native theory are not born out in the findings of virtual world learning evaluations. Mayrath, Sanchez, Traphagan et al. (2007) and Sanchez (2007) discuss students’ experiences of frustration at the counter-intuitive nature of technical control within Second Life. They report that it proved difficult to transfer social practices across technological platforms, and students were not able to quickly master the environment based on their previous engagement with technology. There is supporting evidence of this finding in other instances of virtual world learning also. Herold (2009) echoes the findings of Mayrath, Sanchez, Traphagan et al. (2007) and Sanchez (2007) in using Second Life to teach a media studies course. Although many students had previous experiences in computer gaming, Herold observed that these students still struggled to learn the function of Second Life; even those who had previous experiences in computer gaming (2009). This finding is particularly notable since Herold’s original hypothesis assumed that Digital Native students would grasp Second Life with relative ease, which did not transpire in practice. Mount, Chambers, Weaver et al. (2009) report similar findings in their investigation of learner immersion in a geography planning exercise conducted in Second Life. The value of time investment required to become literate in Second Life’s operation was questioned by students, with the controls presenting difficulties even for experienced computer users (Mount, Chambers, Weaver et al., 2009).

As Petrakou (2010) observed in an ethnographic exploration of virtual world learning:

…the virtual world may be a new environment for students, which means that they have to be introduced to a new world with new social norms and rules, new navigation skills and new means of interaction. (Petrakou, 2010: 1024)

Based on reports of some of education’s initial forays into virtual worlds, it would seem that the Digital Native’s ability to quickly grasp the form and function of any digital technology is debatable. Even whilst engaging with the terminology and the idea of the Digital Native, one partner from the Theatron virtual worlds project emphasised that, ‘They [students] may be digitally natives but they are not virtual natives’ (my emphasis; Childs, 2009: 33).

Other evidence from the virtual world learning literature challenges the definition of a Digital Native by age (or generation) entirely. Daniels-Lee (2009) taught an academic business module that employed Second Life with a substantially positive response from the students involved; albeit with some trepidation about the use of a virtual world in the academic classroom. Girvan and Savage (2010) tested the possibility of communal constructivist pedagogy in virtual world learning with 20 professional educators and found that engagement strategies attributed to the Digital Natives were also routinely used by these (older) participants. Further, Weicha, Heyden, Sterntahl et al. (2010) utilised Second Life as a platform for medical education with postgraduate primary care physicians and received a positive and engaged response. Conversely, Cheal (2009) taught a technology module using Second Life to undergraduate students aged (on average) 20 years old, which received a highly negative response. Over 90% of participants indicated that they would not take another class in a virtual world (Cheal, 2009). Whilst Cheal did not follow up responses with students directly, she speculates their decision not to take another class was a reflection on the medium itself, rather than the topic of the learning strategies. Whereas Lowe (2008) reported that despite undergraduate biology students valuing aspects of virtual world learning, opinions were highly polarised on whether engagement in Second Life was superior to a traditional lab-based approach.
4. Avatar creation, appearance and behaviour: exploring self-presentation in virtual worlds

Nicole Steils

This section will explore a range of literature available on the notions of avatar creation as well as appearance and behaviour as part of a wider concept of self-presentation and identity in virtual worlds.

Avatar appearance and behaviour

Avatar appearance and behaviour are important elements and facets of avatar-based virtual worlds, as the avatar is the means and form by which a user interacts with others. Every user needs to create or customize an avatar as part of the process of entering a virtual world regardless of the reason for entering, whether for leisure, work or education. During this process decisions are made regarding how one presents or represents oneself. This encompasses visual appearance as well as behaviours and attitudes, which can change over time through participation in virtual worlds. As in the physical world, information that we project about ourselves is interpreted by others. Additionally, decisions and interpretations about appearance and behaviour can be influenced by the conditions and the context of our environment and communities (Goffman 1959). In terms of virtual worlds, the possibilities of creating and customising an avatar as a self-representation has developed from solely text descriptions to visual three-dimensional graphical appearances.

Approaching the concept of the avatar

As with the release of Cameron’s science-fiction film ‘Avatar’ in 2009 (Cameron, 2010), the term seems to have become wider established in society in general and also in research in particular. In the film, the ‘Avatar’ was a genetically engineered physical body that allowed the person embodying it to appear akin to the indigenous people on a different planet. Although we might not be able to slip in and out of different bodies in the physical world at present, the possibility of creating and customising a virtual avatar body and...
Avatar creation, appearance and behaviour

appearance to our wishes, needs or desires is available in contemporary and sophisticated virtual worlds such as Second Life. In Second Life several basic models of appearance are ‘on offer’. These default avatars change from time to time, and as of October 2011, new users can choose from human, animal, vehicle or fantasy models.

A twist on the famous cartoon by Steiner (1993) ‘On the internet, nobody knows you’re a dog’ comes to mind; in virtual worlds you can be(come) a dog, a dragon, a robot, a man, a woman, old, young, beautiful, the good, the bad and the ugly. Virtual worlds offer opportunities beyond the restrictions of the physical world, such as dimension, economics, distance, or, here importantly, aspects of individuality such as gender, age, ethnicity or status. These possibilities of creating and altering appearance and being someone else lead to the notion of experimenting with identity, identity play and of having multiple identities. Such ideas refer back to Turkle’s work about identities in MUDs (1996), the idea of experimenting with newly creating yourself in one or even several different ways in spaces which she described as ‘laboratories for the construction of identities’ (1996: 184).

Bailenson and Blascovich (2004: 65) defined an avatar as ‘a perceptible digital representation whose behaviours reflect those executed, typically in real time, by a specific human being’. Meadows (2008) offers an alternate view:

Avatars are interactive, come in different dimensions, and – like people – they view the world from different perspectives. Sometimes an avatar is a photo, sometimes it’s a drawing; it can be based on a real person’s appearance or look nothing like them. Usually avatars are a mix of the real and the imagined. They represent an ‘internet user’.

(Meadows, 2008: 13)

The term Avatar was already used for two-dimensional pictures or icons of users, for example, in internet communities and forums before the ‘animated 3D representations of people or other beings’ of today became available (Schroeder, 2002; Middleton and Matner, 2008: 209).

The etymological origins of the word avatar are to be found in Hinduism. The Sanskrit word Avataar or Avatara, in English literally meaning ‘descent’, is also often translated into incarnation.

In Hinduism, avatar usually refers to the 10 appearances of the god Vishnu; the incarnation of the deity in human or animal form to counteract existing evil in the world (Little, 1998; Tofts, 2003). However, the origins of using the term on the internet are to be found in the name for computer game players’ characters from the 1980s, for example, the user-players in the Lucasfilm game project ‘Habitat’ (Morningstar and Randall Farmer, 1991). In the game ‘Ultima IV – Quest of the Avatar’ players were aiming to become the ‘Avatar’. The use of the term in the meaning of a ‘virtual body’ was further established by the novel ‘Snow Crash’ by Stephenson (1992).

The different forms and shapes in which avatars exist and have developed over the last 30 years can be explored in Cooper, Dibbell and Speaight’s (2007) work on ‘avatars and their creators’. Sixty-two portraits and short profiles of ‘real’ people and their virtual representation, or alter egos in multi-user virtual environments (MUVEs) used for leisure or work are presented. Through combining a picture of the physical person and the virtual persona as well as a short statement or narrative from each portrayed person (or persons, as sometimes two or more people share one avatar), different approaches to avatar creation and customization are revealed. Some appearances reflect the physical appearance, others engage with different or opposite appearances in terms of age, skin colour or sex, additionally we find fantasy appearances such as a furry (impersonation as a feline or another animal with fur) or a spaghetti monster.

Behaviours and attributes portrayed by the avatars (Cooper, Dibbell and Speaight, 2007) are described as being characteristic for and connected to a certain role the avatar plays within a certain group or a world in general, for example having God-like powers. In other cases users described their avatar behaviour and attributes as being the same as in the physical world. In certain situations, avatars were created according to rules given by the virtual environment, for example, when role-playing. In Second Life, more scope is available in terms of user choice of appearance and behaviour, embracing the opportunity to overcome restrictions and norms of the physical world. However, Cooper, Dibbell and Speaight did not portray avatar use in educational settings. It thus remains unknown how conventions of real-world education, combined with learner and tutor perspectives, impact upon virtual world representations. Nonetheless, Cooper, Dibbell & Speaight’s study remains a fascinating read.
The Proteus Effect

When reflecting and discussing avatar visual appearance and behaviour as a means to reflect and present oneself in a virtual world, the findings coined the Proteus Effect (Yee and Bailenson, 2007; Yee, Bailenson and Ducheneaut, 2009) are worthy of attention. The effect is named by the authors after the mythological Greek God Proteus who is “notable for being the origin of the adjective “protean” – the ability to take on many different self-representations” (Yee and Bailenson, 2007: 271). The Proteus Effect is a phenomenon in which users of virtual worlds ‘infer expected behaviour and attitudes from observing their avatar’s appearance’ (Yee, Bailenson and Ducheneaut, 2009: 285). Conforming behaviour to expectations and stereotypes links users to the appearance of their avatars independently of how others might perceive them (Yee and Bailenson, 2007).

In their experimental studies, Yee and Bailenson (2007) explored how levels of attractiveness in avatar appearance changed participants’ behaviours, and how avatar height influenced feelings of confidence of the user. Based on the theory of behavioural confirmation (e.g. Snyder, Tanke & Berscheid, 1977), as well as findings on the interrelation of behaviour and attractiveness (e.g. Langlois, Kalakanis, Rubenstein et al., 2000) three hypotheses were proposed and confirmed through analysis of the findings:

1. Participants assigned with avatars with attractive faces walked closer to a confederate than participants with an unattractive face
2. Participants with attractive faces disclosed more personal information compared to those with unattractive faces
3. A relationship existed between height and confidence, in that participants assigned taller avatars behaved more confidently than participants with shorter avatars

(Yee & Bailenson, 2007: 276)

Such findings go some way in confirming the predictions underlying the Proteus Effect in that observation of appearance in virtual environments impacts upon and shapes users’ behaviours and attitudes, regardless of the behaviour of others. Building on Yee and Bailenson’s research, a further two-part study (Yee, Bailenson and Ducheneaut, 2009) sought to extend these findings;

• To a virtual online setting (via the game World of Warcraft)
• To a face-to-face setting.

In the first phase of their study, Yee, Bailenson and Ducheneaut (2009: 296-300) hypothesised that users of respective taller and more attractive avatars would outperform users of smaller and less attractive avatars (despite neither height nor attractiveness having any functional benefit in World of Warcraft). However, despite the capturing of 76,843 samples there was no straightforward interrelation and linearity between attractiveness and height and performance in the game.

In the second phase, Yee, Bailenson and Ducheneaut (2009) examined virtual world visual appearance and behaviour and its influence on physical world face-to-face behaviour. 40 participants were assigned with taller or shorter avatars. Analysis of the findings from both the virtual setting and the face-to-face setting identified similar patterns. Whilst height was viewed as being of significance, there was not enough evidence to imply that effects triggered in the virtual environment significantly impacted upon the behaviour in the physical setting, or whether it was a case of repetition effects that triggered certain behaviour.

Whilst studies examining the influence of the Proteus Effect offer evidence to suggest that virtual appearance and behaviour seemed to be linked, limitations of the studies leave questions unanswered. Importantly, except for the World of Warcraft study, participants were assigned with their avatars, rather than offered choice. Thus it remains to be seen how participants would behave if they had been able to make their own choice about avatar appearance. Furthermore, no information is given about the ‘physical’ person and how ‘physical world attributes’ influence the virtual reception. Additionally, attention needs to be paid to the conditions of gender, age and/or cultural differences. Finally, World of Warcraft is a specific virtual world, and solely a game, thus questions need to be considered regarding influences due to the game’s structure and content, as highlighted by the ‘creators of avatars’ in Cooper, Dibbell and Spaight (2007).
Avatar creation does tend to differ widely across virtual worlds. For example, in World of Warcraft and Maple Story decisions about avatar appearance were often related to role functions of the game content. However, in Second Life, customising the avatar appeared to be an important activity, as most users admitted to spending a significant amount of time changing the appearance of their avatars. For example, Second Life users in the survey reported having an average of 41 different outfits. Moreover, most had more than one account in Second Life (with more than one avatar), although almost every user (98%) stated they had or used one main avatar. Further findings revealed that gender-swapping was common in Second Life, especially male users customising female avatars. Furthermore, whilst younger users designed their avatars to fit their age, those aged over 40 frequently designed younger looking avatars. Emotional attachment was also of note, indicating that the more the user was able to project him/her-self in-world, the more the user was attached to his/her avatar. Additionally, the psychological relationship of the avatar to the user was explored using an adapted version of the ‘Big Five Personality Test’. This test revealed that users who had time (and ability) to ‘tweak’ the personality of their avatar were more satisfied with their avatar. Unfortunately, gender and age comparisons as well as emotional attachment findings were only presented as a finding across all worlds; hence what can be directly attributable in the context of Second Life is uncertain.

Reasoning for appearances and behaviours

Neustaedter and Fedorovskaya (2009) offer an interesting typology of identities based on avatar appearances in virtual worlds, with a focus on Second Life. They defined four types of users: Realistics, Ideals, Fantasies and Roleplayers;

Realistics - users who want their virtual world and real world identities to be one and the same, constructing their avatars as similar to their physical appearance as possible. Realistics try to continue other facets from the physical world in the virtual world, for instance preferred activities.

Idealists - users who present their physical world identity, however, at the same time they ‘aim to overcome perceived inadequacies’.

Fantasies – users who separate the physical world from the virtual world. They ‘masquerade’ in the virtual world. However, they have a continuing identity in the virtual world.

The Roleplayers – users who separate their physical and virtual life (similar to the ‘Fantasies’). Roleplayers constantly change their appearance and behaviour according to a role given or taken, or in new experiences. They can use alternative avatars for different situations.

The authors highlighted that visual appearance may not always significantly differ from one defined type of user to the other. Therefore, similarities and dissimilarities between the physical and the virtual world only become obvious to those who know about both the physical person and the avatar. Further research is required in order to gain more understanding about the complexity of issues which combine to shape and create avatar appearance and behaviour, and how this manifests itself in relations made amongst the avatars of students and tutors in the use of virtual worlds for teaching and learning in higher education.

Summary of section
- Understanding the interrelation between appearance and behaviour in virtual worlds is a complex undertaking
- Individual aims and desires as well as the context influences how a user creates and customizes an avatar to present or represent her/himself
- Expectations of others, links to certain environments and/or former experiences are seen to impact on avatar creation and customization.
- The ability to create an avatar is managed and potentially confined by the technical facilities as much as the user’s skills and endurance.

(Neustaedter & Fedorovskaya, 2009)
5. Presence and identity

Maggi Savin-Baden

This section will explore the relationship between presence and identity in virtual worlds and suggests that there are a number of competing ideas and concepts that result in difficulties in understanding the impact of identity issues on teaching and learning.

Issues of identity in a recent study by Savin-Baden (2010) overlapped with participants’ sense of presence. Identity is often confused with role, particularly in studies that have explored ‘identity’ in role playing games. Salazar (2009), for example, provides a somewhat inchoate account of his ‘social identity model’ which seems to provide little more than role delineation in online games, whereas Hall (1996) has argued:

... Identity does not signal that stable core of the self, unfolding from beginning to end through all the vicissitudes of history without change... Nor - if we translate this essentializing conception to the stage of cultural identity - is it that collective or true self hiding inside the many other, more superficial or artificially imposed ‘selves’... identities are never unified, and in late modern times, increasingly fragmented; never singular, but multiply constructed across different... discourses, practices and positions.

(Hall, 1996: 3–4)

Authors such as Turkle imply certain troublesomeness about identity, arguing it is the ‘computer culture that has contributed to thinking about identity as multiplicity’ (Turkle, 1996: 178–180). Although this multiplicity has always existed, what Turkle is suggesting is that computer mediated communication has enabled us to see this more readily. In particular she suggests that computers change not only what we do, but how we think about ourselves and the world, and argues that computers are not merely objects that make our lives more efficient, but are subjects that are intimately and ultimately linked to our social and emotional lives (Turkle, 1984; 2005). Although Baños, Botella, Alcañiz et al. (2004) have suggested that immersion tends to be seen as an objective description of the technology and presence a subjective experience, participants’ views in this study seem to present less polarity. In-world identity - the degree to which the avatar is seen as representative of some kind of identity that relates in some way to real life identity- is something that appears to be on a continuum.

Authors such as Nakamura have discussed identity tourism; a metaphor developed by Nakamura (2000) to portray identity appropriation in cyberspace. The advantage of such appropriation enables the possibility of playing with different identities without encountering the risk associated with difference in real life, but such practices were not evident here. Instead participant stories reflected a sense of ease with Second Life and an interest in identity exploration for most, but for some a sense of frustration connected with poor proxemics and insufficient gestures and gaze to promote meaningful interaction. It also related to a sense of discomfort with both having and possibly ‘being’ an avatar. The stripping away of real world identity can be unsettling and seen as a loss to some Second Life users - the sense of losing one’s name, adopting a different appearance and moving differently is often more than uncanny, it is more akin to the numinous. The numinous includes the sense of awe, fear, dread and the uncanny:

... the Numinous is already contained in the idea of the dangerous, or that any perception of danger or any dislike of the wounds and death which it may entail could give the slightest conception of ghostly dread or numinous awe to an intelligence which did not already understand them. When man (sic) passes from physical fear to dread and awe, make a sheer jump...

(Lewis, 1940: 9)

The idea that experiences of immersive worlds are strongly located in the numinous emerges because of people’s sense of awe and dread along with sometimes a sense of dual consciousness. Certainly the relationship between the real and the virtual body is something that Savin-Baden and Sinclair (2011) have found troublesome. They assert:

The notion of what presence and embodiment mean in digital spaces was something that was constantly problematic for us. The way we seemed to cope in this silent space in the earlier stages of the course was to (super) impose what we ‘knew’ using an identity we felt we ‘had’. We both intuitively felt that this new learning space was distinctively different but it might be that we were imposing difference on it because it was new and unfamiliar, which would seem to be a contestable position, just as is the notion that we are somehow disembodied in cyberspace. Thus, there is an assumption that because we were not ‘seeing’ non-verbal cues such as eye contact and body language, this is making online learning and communication difficult. However, it might be the case that new and diverse forms of communication are emerging that are creating new textual and identity formulations, not previously located or understood.

(Savin-Baden and Sinclair, 2011)
What we are seeing here is perhaps then a spilling over, a sense of an overlay between space and identity in immersive worlds. In-world identities still seem to be an area of difficulty - in terms of unpacking and understanding them. It is not clear if people are just adopting different in-world roles, whether there are indeed strong identity connections or there is a spilling over between worlds - both ways. Collision and overlap occurs in immersive worlds in terms of physical positions, customs, cultures and ways of operating. For example, there is often a perception by university staff that they live and work in separate worlds, and that to go from one to another is almost like passing through the wardrobe into a Narnia world (Lewis, 1950). Yet these are not separate worlds but are spaces that have to be managed in relation to one another.

Summary of section
- Real life identity is something that appears to be on a continuum.
- There is often a perception by university staff that the virtual and the real are separate worlds
- Identity remains a troublesome concept in real and virtual spaces

6. Pedagogical strategies

Maggi Savin-Baden, Cathy Tombs and Gemma Tombs

Whilst the areas of student experience and policy in virtual worlds have been generally under-discussed, pedagogical strategies employed within virtual worlds are the topic of a growing literature and particularly so in specific journals such as the Journal of Virtual Worlds Research. This literature comprises empirical research, conceptual papers and attempts to establish frameworks of pedagogical strategies employed in virtual worlds, although we would contend that after a ‘boom’ of work published between the years 2008-2010, the field is less active at present. This therefore seems an opportune moment to continue the work of Lim (2009), Warburton (2009), Dalgarno and Lee (2010), all of whom have presented initial frameworks and lists of affordances.

Drawing together Savin-Baden’s (2010b) recent work on learning theory with examples from the literature, in this next section we offer a snapshot of the types of pedagogies employed within Second Life. The reference to Second Life specifically as opposed to all virtual worlds (although we encompass OpenSim within this) allows reference to Second Life’s specific affordances such as changing avatar appearance (Mayrath, Sanchez, Traphagan et al., 2007) and object creation.
Uses of virtual worlds

The following table draws on both examples from the literature and learning theories in demonstrating attempts to define the relationship between the media and the pedagogy. It is intended to provide illustrative as opposed to definitive examples, since the combination of multiple learning theories is common.

Table 4: Theories to inform design

<table>
<thead>
<tr>
<th>Pedagogical approach</th>
<th>Related theory</th>
<th>Theorist</th>
<th>Types of Second Life activities that match, with some examples from the literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem-based learning</td>
<td>Critical pedagogy and social action</td>
<td>Freire (1972, 1974), Hooks (1994)</td>
<td>A scenario that prompts students to examine structures and beliefs about Second Life being a panoptican e.g. Good, Howland &amp; Thackray (2008); Conradi et al. (2008); Omale et al. (2009); Ditmer (2010); Rogers (2011)</td>
</tr>
<tr>
<td>Activity-led learning</td>
<td>Complexity model</td>
<td>Barnett and Coate (2005)</td>
<td>Team-led activities such as designing a lighting system for a production of Hamlet</td>
</tr>
<tr>
<td>Dialogic learning</td>
<td>Community action</td>
<td>Mezirow (1985), Flecha (2000)</td>
<td>Student-led learning teams that focus on discussion and reflection e.g. Petrakou (2010)</td>
</tr>
<tr>
<td>Action Learning</td>
<td>Change management</td>
<td>Revans (1983)</td>
<td>Group-led discussion and reflection on action e.g. Wagner &amp; Ip (2009)</td>
</tr>
<tr>
<td>Project-based learning</td>
<td>Cognitive learning theories</td>
<td>Vygotsky (1978), Ausubel et al.,(1978)</td>
<td>Tutor-set, structured tasks, such as building tasks e.g. Cargill-Kipar (2009); Jamon et al. (2009)</td>
</tr>
<tr>
<td>Inquiry-led learning</td>
<td>Discovery learning</td>
<td>Bruner (1991), Dewey (1938)</td>
<td>Students decide on their own about issues that emerged during a practice or fieldwork component of their course, and they set their own objectives as to what they want to learn. e.g. Jimenez-Bescos et al. (2011)</td>
</tr>
<tr>
<td>Leaderless group discussion</td>
<td>Humanism</td>
<td>Rogers (1969)</td>
<td>Student-led discussion Second Philosophy Group (Oxford University)</td>
</tr>
</tbody>
</table>

Case examples

The following case exemplars, taken from our own research into teaching and learning using Second Life, illustrate how the pedagogy underpins the practice.

Palliative care problem-based learning in a virtual village

A new course at Coventry University, ‘Children and Young Person’s Palliative and Complex Care’, involves a module making use of the virtual learning environment (VLE) MOODLE and Second Life. A ‘virtual village’, known as Central City, has been developed in Second Life, and contains a variety of information in different forms for the students on the module. The students focus on one patient throughout the ten weeks of the module, and the virtual village houses important buildings to the patient, such as the patient’s home and school, a doctor’s surgery, a children’s hospital and a hospice. In each week, which identifies a different topic, the students are able to explore these buildings and listen to key persons involved in the patient’s life such as social workers, doctors, and family members.

VLE:
A set of learning and teaching tools involving online technology designed to enhance students’ learning experience, for example Blackboard, WebCT

MOODLE:
A free course management system used in online learning

The students can find information in the virtual village in a number of formats, such as audio clips, interactive objects, video segments, articles and websites. Whilst they are given key tasks to complete individually each week, both the Second Life chat function and the message boards on MOODLE allow for the students to take part in discussions about the tasks and the patient. Additionally, by ensuring the village is as visually realistic as possible, the students are able to feel more immersed in the scenario.

The underpinning pedagogy here is Model III Problem-based learning for interdisciplinary understanding (Savin-Baden, 2000). In this model there is a shift away from a demand for mere know-how and propositional knowledge. Instead, problem-based learning becomes a vehicle to bridge the gap between the know-how and know-that and between the different forms of disciplinary knowledge in the curriculum.
Project management problem-based learning in Second Life

One of the scenarios from the PREVIEW project (Savin-Baden, Tombs, Poulton et al., forthcoming 2011; Beaumont, Savin-Baden, Conradi et al., forthcoming 2011) was adapted for use in a module on project management at Coventry University. The students were given information on a disease outbreak in a care home, and were required to use this information and objects around a virtual office in Second Life to develop a strategy and identify key stakeholders. The students worked in teams of five or six, utilising the virtual world and several key components such as the chat function, a collaborative whiteboard and an artificially intelligent agent or ‘chatbot’.

The underpinning pedagogy here was Model II Problem-based learning for professional action (Savin-Baden, 2000). This model of problem-based learning has, as its overarching concept, the notion of ‘know-how’. Action is seen here as the defining principle of the curriculum whereby learning is both around what it will enable students to be able to do, and around mechanisms that are perceived to enable students to become competent to practice.

Paediatric medical Second Life simulation

A paediatric medical simulation, developed for the University of Texas Arlington (UTA), involved students participating in an individual Second Life activity. Each student had undertaken a paediatric simulation in UTA’s ‘Smart Hospital’ prior to the Second Life simulation. The learning outcomes of both simulations were identical, and the steps the students took in the Smart Hospital simulation were matched as closely as possible in Second Life.

Each student was required to enter a virtual hospital room with a six-month-old baby as the patient. Their task was to prepare, examine, diagnose and treat the patient using virtual objects (such as a thermometer and stethoscope) and menu options. The processes that the students followed were individually recorded in an online database, and used by the UTA faculty for reflection and evaluation.

The underpinning pedagogy here was project-based learning (Savin-Baden, 2006). This is predominately task orientated and the project is often set by the tutor. Even if the task or topic is not set, then the parameters and criteria for submission usually are. In this approach students are required to produce an outcome in the form of a report or design, in problem-based learning the focus is not on this kind of outcome. Further, students are required to produce a solution or strategy to solve the problem, whereas in problem-based learning solving the problem may be part of the process but the focus is on problem-management, not on a clear and bounded solution.

In the following table Boardman (2009) offers useful design suggestions for beginning to develop material for Second Life:

Table 5: A typology of thinking about virtual world learning scenario design
(Boardman, 2009) from Savin-Baden (2010b)

<table>
<thead>
<tr>
<th>Cafe</th>
<th>Canteen</th>
<th>Dwelling</th>
<th>Office</th>
<th>Theatre</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔ (✓)</td>
<td>✔</td>
</tr>
<tr>
<td>Detailed text scenarios provided</td>
<td>x</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Staff care what it looks like</td>
<td>x</td>
<td>✔</td>
<td>✔ (✓)</td>
<td></td>
</tr>
<tr>
<td>Affects learning outcome</td>
<td>✔</td>
<td>x</td>
<td>✔ (✓)</td>
<td></td>
</tr>
</tbody>
</table>
Boardman (2009) argues that some of the questions that should be asked of staff can subsequently save designers and technologists considerable time. For example, does it matter that the dwelling is a texture or a hut? Are staff concerned about the appearance of objects and buildings, especially if this appearance is unlikely to affect the learning outcome? In the PREVIEW project (Savin-Baden, Tombs, Poulton et al., forthcoming 2011; Beaumont, Savin-Baden, Conradi et al., forthcoming 2011), it did matter both that the audio sound (ringing) came from a telephone, and it was something students would recognise, so they would realise they should touch the telephone in order to get instructions. Boardman suggests then that staff need to consider issues of design that relate to ensuring students engage, that the buildings, objects and activities are both relevant and believable, that they are easily navigable and that they help students to focus on what is to be learned.

Summary of section
We have considered how pedagogical strategies have been employed within virtual world teaching and learning
We have provided attempts to define the relationship between the media and the pedagogy through illustrative examples
We have considered how issues of design matter to support student engagement

7. Educational policy and virtual worlds
Gemma Tombs

This section explores the literature available on the topic of e-learning in higher education, situating virtual worlds against this backdrop. It will first offer a brief history of e-learning policies in the UK, and then focus upon the place of virtual worlds in national policy initiatives.

Any review of e-learning policy is likely to be out of date almost as soon as it is written (Smith, 2005), and few up-to-date comprehensive and systematic reviews of national (and international) e-learning policies exist at the present time. Virtual worlds, which have only recently entered the public consciousness (circa 2005 onwards) thus occupy an uncertain space in policy, and specifically within educational policy. This section reviews current trends in e-learning policy, explores wider public policy regarding virtual worlds and seeks to begin to ascertain a place for virtual worlds in UK e-learning policies.

History of e-learning policy
The use of technologies within higher education spans several decades and has become increasingly predominant from the mid-90s onwards with the creation of the Joint Information Systems Committee (JISC). Smith (2005) has traced the emergence of information and communications technology, with associated policy initiatives, from 1965 to 2005, and in doing so he categorised technologies into four distinguished periods:
History of e-learning policy

The use of technologies within higher education spans several decades and has become increasingly predominant from the mid-90s onwards with the creation of the Joint Information Systems Committee (JISC). Smith (2005) has traced the emergence of information and communications technology, with associated policy initiatives, from 1965 to 2005, and in doing so she categorised technologies into four distinguished periods:

- **Phase 1** (1965 – 1979): observed the development of centralised mainframe systems, with time-share resources and expert operators
- **Phase 2** (1980 – 1989): was recognised by Moore’s terminology of ‘early adopters’ and saw the uptake of stand-alone and distributed systems
- **Phase 3** (1990 – 1999): encompassed a period of cheaper (and therefore more readily available) technologies, alongside the move towards and adoption of ‘New Managerial’ ideologies, and thus was characterised by the impact of the internet and the development of networked technologies with a focus on increased collaboration and communication
- **Phase 4** (2000 – present): aftermath of the 1990s and the Dearing Report, from the new millennium onwards, recognises a coherent and long-term approach to the application of learning technologies

It is phase 4 (from 2000-present) which signifies the ‘politicisation and systematisation of e-learning … as policy and funding pursues large-scale development to harness potential in this area’, as shown by the 2005 HEFCE E-Learning Strategy and the CETL project, amongst other examples (Smith, 2005: 105). This phase has been maintained in the 6 years since Smith’s analysis as represented within the Harnessing Technology Report (2005), HEFCE E-Learning Strategy (2009), Digital Britain Report (2009) and the increasingly diverse role of JISC. The 2009 Digital Britain Report demonstrated the policy commitment to e-learning throughout the educational sector:

> **HEFCE:** Higher Education Funding Council for England
> **CETL:** Centres for Excellence in Teaching and Learning – a UK-wide initiative intended to reward excellent teaching in Higher Education, running from 2005 – 2010

Most interestingly for virtual worlds, Smith (2005: 105) refers to learner-centrism in phase 4 as a policy focus which had not yet been realised by the available commercial tools, suggesting that ‘there appears to be support for a return to the second phase of learning technology policy, where individuals innovate in a learner-centred way’ The policy commitment to learner centrism can be recognised through a brief analysis of the HEFCE 2009 E-Learning Strategy. This draws upon the 2005 Harnessing Technology report and its focus on ‘learner entitlement’ (2009: 7), and this is clearly reflected in the priorities of the strategy. For example, 12 of the 38 strategic priorities refer specifically to retaining learners and meeting learners’ expectations, student achievement, enhancing flexibility and choice for learners and supporting a diversity of learners through widening participation. The 2011 ‘Students at the Heart of the System’ White Paper would suggest that the Conservative and Liberal Democrat coalition government intends to emphasise this policy focus. This focus upon learner-centrism in policy, whilst not realised in technology at the time of Smith’s writing, has some resonance with virtual world literature. It could perhaps be inferred from pedagogical strategies used in virtual worlds, such as problem-based learning and constructivist learning approaches which allow a more learner-centric style of learning, that this technology might provide the opportunity to realise learner-centrism in e-learning policy.

Virtual worlds and national policy

Virtual worlds occupy an uncertain space in higher education, and as such, their relationship to national and institutional policy initiatives is also uncertain. Taking Smith’s (2005:105) diagram of educational policies mapped against technological developments as a starting point, we have charted virtual world developments alongside their representation in public policy. The diagram below demonstrates the increasingly prominent policy discussions surrounding virtual worlds both in general and in education:

Used well, technology strongly develops the study and learning skills children need now and in the future… Even now, a reasonable grasp of ICT is needed in education and employment, and it will become increasingly important to command ICT skills to prepare for technologies in the future… We must avoid raising a population divided between ICT “haves” and “have nots” because this would pose a considerable threat to both economic wellbeing and social cohesion.

(Digital Britain Report, 2009:165)
Virtual worlds, whilst referenced in the documents in the lower half of the diagram, are largely not discussed in relation to the complexities of policy involved. With regard to pedagogy, this is not necessarily an exemption which is unique to virtual worlds, as e-learning technologies have often been amalgamated under this one umbrella term and referred to as such. JISC’s 2010-2012 strategy draws on the virtual world Second Life briefly as an example; therefore it could perhaps be assumed that, in a policy sense, virtual worlds have been embraced under the umbrella terms of ‘digital technologies’, ‘new technologies’ ‘e-learning technologies’, ‘Web 2.0 tools’ (descriptions which are commonly used in association with virtual worlds) and a variety of other descriptions. However, terms such as virtual world, Second Life or other specific virtual worlds are excluded from the strategy’s Glossary of Terms which does include definitions of wikis, virtual learning environments, virtual research environments, blogs, cloud computing and video conferencing. Recent e-learning documents from HEFCE, SFC and HEFCW also employ umbrella terms rather than referring to technologies specifically, and so give little insight into their perceived positioning of virtual worlds in national policy.

In contrast, the national Digital Britain Report noted both the business and educational potential of virtual world use (2009: 130-131), drawing upon them as an example of creative industries in the digital world. Complex factors such as taxation and intellectual property (as referenced in the recent OECD report) are noted as significant for further analysis. The report notes both their ‘interesting scope’ for education but also the ‘significant challenges’ that they pose given their operation across national boundaries. These are challenges which, whilst they primarily refer to commercial and not educational use, have generally been ignored within the literature. This same report, as supported by the work of BIS shown in the diagram above, makes it clear that the national government is nominally engaged with virtual worlds:

The UK has taken a leading role in initiating international discussion on the public policy implications of virtual worlds, for example with a highly successful workshop for OECD member countries – on Innovation and Governance in Virtual Worlds… BIS has been asked to draft the Terms of Reference for [a proposed OECD major study on virtual worlds].

(Digital Britain Report, 2009: 131)

This OECD study has recently been published, concluding:

Some policy challenges have intensified with the diffusion of virtual worlds, and thus may require existing policies to be re-thought in this digital context.

(OECD Report, 2011: 33)

Roth (2010: 9), drawing on the OECD involvement as an example, comments that “by ensuring that the UK is at the forefront of Virtual World discussions, it will be able to make the most of the opportunities presented by Virtual Worlds.” However, the subtleties of the UK government’s policy commitment may also be significant here. Virtual worlds are mentioned in a policy publication at a national level, but within a section on ‘creative industries’, not education. They are nominally included within JISC, the HEA and the funding councils under umbrella terms but not made explicit. As such, virtual worlds occupy an almost ‘invisible’ space in policy, alongside a plethora of other e-learning technologies. Whilst the previous UK government has claimed to be “taking a leading role in initiating international discussion on the public policy implications of virtual worlds”, it remains to be seen if and how this might manifest in educational policy.

Summary of section

This section has demonstrated the increasing representation of virtual worlds in public policy (particularly over the past year), and their amalgamation into the “umbrella” term of e-learning technologies.
8. Conclusion

Katherine Wimpenny

This review has provided an indication of the way virtual worlds are being used for learning and teaching in higher education. It has sought to unpack, explore and locate within the literature, a number of themes which have been found in relation to our research.

We have examined the importance of appreciating the use of terms currently used in the literature for learning technologies, and how the use of terminology often conveys a message in itself which needs to be understood better. We suggest more attention is required regarding the categorisation of virtual worlds in order to move away from an assumed continuity amongst virtual world usages.

The literature regarding the Digital Native was reviewed to question how such a concept has become so ingrained in academic discourse. A core concern expressed was how the Digital Native still appears within the literature as a way of understanding students. What was highlighted is how other factors including social environment, experience with technology, self-efficacy, and so forth are arguably of more significance than focusing upon a person's age when examining technological practices.

There has been relatively little consideration of the ways in which space is seen both as a site of learning and as a site of power, whether in real or virtual spaces. Universities and university leadership in particular seem to take little notice of the understandings, formulations and functions of space. In addressing space and spatiality in 3D virtual worlds we have identified with the 'taken for granted quality' about the way teaching within virtual worlds is spatially constructed and the impact this has on the spatial norms of learning. What has been highlighted is how further research is required in order to better appreciate and examine how spatial norms and practices shape social and pedagogical practices.

In considering how virtual worlds occupy an uncertain space in higher education, we examined their uncertain relationship to national and institutional policy initiatives. Whilst the current e-learning policy focuses on learner-centrism, further focus on academic issues, not least in terms of support for the development of learning technologies, their implementation and evaluation is required. UK policy needs to provide a better means of supporting universities and their staff to lead the way in developing virtual world usage, which makes best use of its creative space, capitalising on a sense of novelty and surprise, (Jankowska and Atlay, 2008), whilst being aware of expectations and reference points for the learner.

We have located examples from the literature examining self-presentation in virtual worlds, highlighting choices made by users regarding the construction of avatar appearance and avatar behaviours. Such choices reflect the complexity of issues surrounding identity and representation, which need to be considered when designing learning using virtual world technologies. We suggest that students’ expectations, aims and desires, as well as their anxieties involved in their creation of an avatar for use in learning situations in virtual worlds in higher education, requires further investigation.

In summary, as noted at the outset, this content is offered in order to prompt discourse and debate. We look forward to engaging with others in the field of research to explore issues we have raised. As suggested by Savin-Baden (2007:149) curriculum design needs be ‘created around a constellation of uncertainties, negotiated assessment and rewritable learning intentions,’ so that curricula for teaching and learning using virtual world technologies can become sites of transformation for those involved.

Where do we go from here...?

Whilst this review has identified themes relating to our research in relation to the wider literature, our focus is also directed on disseminating the findings from the data collected during the course of the Leverhulme Trust funded study. As part of this, a new approach to qualitative synthesis has been developed by Maggi and Katherine, to facilitate collation of the data from across the 3 PhD studies. This methodology, Participatory Action Synthesis (Wimpenny and Savin-Baden, under review) is a collaborative approach to data analysis, synthesis, interpretation and knowledge construction, enabling individual data generation and its analysis to be offered for communal analysis. Thus, more than purely combining the students’ qualitative data sets, participatory action synthesis is providing valuable integrated forms of knowledge and a means of making (meta) interpretations between the data sets, in order to make sense of the whole. A paper outlining this new methodological approach is currently under review. A team paper (also under review) which has embraced a shared theme from across the students’ data relating to ‘frames of reference informing the design of virtual world learning’, has been written using this approach and is due to be presented at the ECEL conference (2011). The synthesis of the project data will continue to utilise a participatory action synthesis methodology. We look forward to the continued dissemination of outputs from our work on this project. An appendix available at the end of this review identifies with a number of other publications already obtainable.
References


References


Dittmer, J. (2010) ‘Immersive Virtual Worlds in University-Level Human Geography Courses.’ International research in geographical and environmental education 19, (2) 139-154


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Smith, J. (2005) ‘From Flowers to Palms: 40 Years of Policy for Online Learning.’ ALT-J 13, (2) 15


Glossary

Second Life – a 3D virtual world created by Linden Labs, set in an internet-based world. Users of this world interact with each other and can learn, socialise, participate in activities, and buy and sell items with one another.

Virtual spaces – spaces in which online technology is used

Virtual reality – a simulated computer environment in an either real or imaginary world.

Mixed reality – is seen as a method for integrating virtual and physical spaces much more closely so that physical and digital objects co-exist and interact in real time.

Overlay – where two virtual spaces overlap with one another

Augmented virtuality – this is where the virtual space is augmented with aspects from physical space, so there is a sense of overlay between the two spaces.

Spatialiation – A mode of production of space, the way that social activities and material things, phenomena or processes take place in a given space

Spatiality – where the use of space is defined by the way it is used socially

Rezzed – an object can appear by dragging it from a Second Life resident’s inventory or by creating a new one via the edit window. The term “rezzing” can also be used for waiting for a texture or object to load, such as “Everything is still rezzing.”

Digital native – A term originated by educationalist Marc Prensky (2001a; 2001b) to refer to those born post-1980, for whom digital technology has been pervasive in the formative experiences of their childhood and early adulthood.

Digital immigrants – A term originated by educationalist Marc Prensky (2001a) to refer to those born pre-1980, for whom digital technology was not pervasive in their childhood or learning experiences.

Millenials – Terminology from Howe and Strauss (2000), see Digital Native.

Net generation – Terminology from Tapscott (1998), see Digital Native.

Google generation – Terminology from Oblinger (2008), see Digital Native.

Avatar – the bodily manifestation of one’s self in the context of a 3D virtual world.
MUD – Stands for Multi-User Dungeon or Domain, a virtual space in which users can create, share and collaborate.

Multi-user virtual environments – Also known as virtual worlds. Second Life is a multi-user virtual environment.

MOODLE – A free course management system used in online learning.

Chatbot – an avatar controlled by a computer, also known as an artificially intelligent agent.

HEFCE – Higher Education Funding Council for England


SFC – Scottish Funding Council

HEFCW – Higher Education Funding Council for Wales

OECD – Organisation for Economic Cooperation and Development - an organisation focussed on encouraging international policy cooperation, with specific regard to economic and social wellbeing.

BIS – Department for Business, Innovation and Skills - UK government department with responsibility for universities

Virtual policy network – A think-tank promoting international policy debate about virtual worlds, online games and other convergent media.

Virtual learning environment – a set of learning and teaching tools involving online technology designed to enhance students’ learning experience, for example Blackboard, WebCT.

Blog – personal websites consisting of regularly updated entries displayed in reverse chronological order.

Cloud Computing – a range of web-based hosting services as opposed to direct connection to a server, such as Dropbox or web-based email

Wiki – server software that allows multiple users to contribute to and edit web page content.

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Appendix

Publications linked to the research

**Peer-reviewed articles**


**Forthcoming peer reviewed articles**


Wimpenny, K., Savin-Baden, M., Mawer, M., Steils, N. and Tombs, G. ‘The Socio-Political Impact of Virtual World Learning on Higher Education: Findings from a Three Year Study.’ AJET


**Books**


**Book Chapters**
