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## **Realism or Non-Realism: Design of learning spaces in Second Life**

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Many thanks to our moderator Millay for the introduction.

Many thanks for coming along to our presentation. I hope you enjoy it.

This box has a note card which will give you the location of our transcript of today's presentation along with some literature resources. We have also included the website of our project on the note card.

Our project is on how learning spaces should be designed in Second Life. Our presentation has three parts: I will start by giving you a background of our project and the motivation of our research. My colleague Idem will give you a review of our results so far.

I will then conclude by sharing with you what we have learned so far and how we feel that this research can be taken forward.

During our presentation, please send your questions to our moderator and we will pick them up after our presentation.

It was in April 2008 when our Head of the Department asked us to develop specifications of our department's presence in Second Life.

We searched for literature sources but the key papers or pointers came from our very generous colleagues on the SLED List.

The papers, particularly, Jennings and Collins, 2007, offered useful insights in terms of how the learning spaces in Second Life are designed but there weren't any papers or reports that captured experiences of students, educators and designers Or any guidelines – eg do's and dont's of how learning spaces should be designed...

So the question that we started with in our research is: How should 3D learning spaces be designed for learner engagement?

Our goal has been to gather experiences of students, designers and educators – and the as an outcome of this research, we will develop guidelines and design rules on how learning spaces in Second Life should be designed.

But we are specifically interested is realism and non-realism of the designs: if it's a fantasy environment, for example, a class room on the sea floor or high up in the sky

with dragons floating by – does it engage students more than a realistic setting – a traditional class room with tables and chairs?

As we started with our research we realised that it is not just the investigation of the designs of educational islands but we need to investigate the designs of individual learning spaces within an island.

Also, is there a relationship between the designs of learning activities and the designs of learning spaces?; how a learning space should be designed to support a learning activity and to facilitate learning and student engagement?

In our presentation today, we will focus on educators' perceptions of learning spaces within SL; these are results from the interviews we have conducted with educators over the last 6 months or so.

Although, we have focussed on SL in our empirical study, we hope that the results will be applicable for 3-D VWs in general.

As we know that 3D VWs are different from 2D environments like blogs, wikis and forums and they can support sense of presence, sense of space, and sense of being there with others... and unlike real-life spaces or physical designs, realism and non-realism can be blended in the designs of learning spaces in SL.

For example, a highly realistic SL environment might be a replica of a university's real-life campus, with similar buildings, rooms and outdoor spaces. In contrast, an environment at the opposite end of the realism spectrum might be a fantasy space with undersea areas, airships or anything else imaginable.

Based on our empirical investigations, we have developed five categories of visual realism in SL:

<I will discuss them with the help of the images on this board>

- (1) **Photo-realistic (PR)**: an SL space design where it is as much as possible like parts of a real campus or real-life location and would be recognisable to a visitor who knew that place

*This is an example of a campus in SL which is an exact replica of RL*

*This is an example of a building in Birmingham, an exact replica of the building in RL. (referring to the slide presenter)*

- (2) **Artistically-realistic (AR)**: Defined as a SL space that has features which might appear similar to parts of a real campus, but a visitor who knew the real life campus would not necessarily recognise it from the learning space

*This is an example which is similar to a real life campus but may not be easily recognisable.*

- (3) **Metaphorically-realistic (MR)**: Defined as a SL space that has features which are metaphorically significant but which bear no resemblance to the real campus

*This has not similar to real-life learning spaces but is an informal area with seating which has the affordance or indicates to the user to sit.*

*This is an example of a discussion area from a SL philosophy group- the topic being discussed was the Ethics of Test Tube babies and the space has been designed around that theme*

- (4) **Fantasy (F)**: Defined as a SL space that has little resemblance to a real life space, though there may be some buildings and other recognisable spaces within it. It is a fantasy island with many unexpected places to discover and explore.

*This is an example of a fantasy space where holes in the ground lead to meeting areas  
or, an underwater auditorium even with fire burning...*

*or another underwater area which has some artefacts from real life such as the power point presenter, sofas and flip chart*

- (5) **Open Space (OS)**: Defined as a SL space that has a lot of open space, with few buildings or features.

*Finally, open spaces are commonly seen in many islands – especially for design courses – giving students the space and ownership to the area.*

We formulated four research questions for our empirical study involving SL educators:

The first Q: What exactly do we mean by a ‘learning space’?

So, Does it mean a designated teaching area such as a sandbox or meeting place, or does learning also occur in social or other private spaces? This question was important in order to elicit from educators exactly where they thought learning took place in relation to their SL activities.

The second Q: How many levels of realism can users actually distinguish between?

The third Q: Does the level of realism influence the experiences of a learning activity, and why?

The fourth Q: How has the pedagogy influenced the design, and specifically the realism of the learning space(s) and vice-versa? Here we ask about the relationship between the design of a learning space and the pedagogy used – how does one affect the other, and which came first.

We have carried out inductive or thematic analysis of the interview data which my colleague Idem Rajal will discuss.

**Thank-you Shailey. My name is Ahmad Reeves and I have been working with Shailey on the Delve project at the Open University. I would like to present the results section of our paper with you.**

Our analysis provided four interesting themes in relation to realism and the design of virtual learning spaces and I would like to address each on in turn.

**The first theme deals with the issue of 'Where does learning occur?' This theme relates to the educators' varied interpretations of what a learning space actually is.**

At one level, some of the educators mentioned that learning occurs in the point of contact with the resources, for example with building or scripting work.

At a second level the learning was described as 'activity-focussed'. One educator commented on the need for student guidance in relation to where learning was expected to occur and what was expected of them. We found several examples in our data where the learning spaces had been both divided and specifically designed to support different kinds of learning activities. For example, for practising building and scripting or doing project work.

At a third level the entire island can be thought of as a learning space, through socialisation, informal situations and networking that could take place anywhere in the island.

At a fourth level another educator discussed how learning could occur in a number of islands within SL, with tours and exploratory work being done in many distinct SL locations.

Finally one educator said that learning can occur anywhere dependent upon the state of the learners mind at any one time. So it is possible for a learner to be in a formal learning activity and not actually learn anything, yet be in an informal social area or fun space and with the correct state of mind learn many new things.

So we can conceptualise **five** distinct levels within which different ways of learning can occur.

**The second theme relates to the role of visual realism in the design of learning spaces**

The first role of visual realism we found was in meeting the purpose of the space, so for example

- role-playing and the realism of the avatar,
- non-realism of open spaces for building work,
- realistic social spaces such as clubs and discos, and
- meetings benefiting from both forms of realism dependent upon their nature.

The second role of visual realism was in order to gives clues to the expected behaviour of the user in a space, for example standing or sitting, acting formally or informally etc.

A third role of visual realism was in order to help in understanding a real-life phenomenon, yet this may be problematic in terms of providing the user with the desired level of emotional experience. For example, learning in health care scenarios where you can role play potentially fatal or highly traumatic situations without 'experimenting' on a real person, you would lose possibly some technical understanding of how to manage a trauma situation but also your emotional connection with the experience the less real it is - so in this case the learning value of the situation and the experience is more questionable.

A fourth role of visual realism was to support the interaction itself. When asked regarding the realism in their learning space designs, some educators understood the term 'realism' in relation to the learning activity or interaction that was taking place. For example, 'interactional realism' was crucial in order to make the learning experience as authentic as possible, for example with a role-play scenario based on an industrial accident investigation.

Our respondents noted that such types of simulations can be problematic in SL. In one example a film-scouting activity was difficult in terms of recreating the sense of space and feeling of a used and crowded building, the recreation of poor weather conditions, or on the spur problems of children running around! Also problematic was the realistic simulation of communication in terms of facial expressions and the nuances of having a sixth senses and creating ambiance.

**Our third theme relates to how the different levels of realism (e.g. PR, AR, MR, OS, F) of the learning space discussed earlier relate to the design of learning activity.**

As we have just touched upon, one relationship is in the use of real-life simulations which facilitate learning through exploration and observation and require high levels of visual realism in terms of the learning space e.g. photo-realistic realism. Sometimes the visual realism can be in terms of an object instead of the space such as a recreation of a computer motherboard to teach electronics for example.

Another relationship is in providing users with familiarity and comfort in the learning space. So the realism levels of AR and MR are often used to provide familiarity and for supporting the learners existing mental models of what to expect and how to interact or behave.

For fun activities MR and F were used to encourage fun, play and imagination to support learning and encourage creativity. Examples here include the use of sky-boxes, Alice in Wonderland rabbit holes, walking underwater or train rides in the sky!

With regard to artistic work or building/scripting work, OS was used to make it as easy as possible for students to build and take ownership of their work.

**Or final theme relates to how pedagogy drives the design of learning spaces**

Many educators were interested in learning and not branding, in other words the design was driven by the desire to support a particular learning methodology rather

than as a marketing tool for the institution. Educators commented on how they took their existing pedagogies (many of them mentioned constructivist pedagogies) and then took advantage of the affordances of SL to use interactive 3D objects that encouraged a wide range of study skills such as collaboration, creativity, student led work, motivation, peer review, and reflection on progress.

Other educators commented on how SL supported an experiential rather than an instructional pedagogy. One example from Art education was where an educator described using SL as a 'Hyper Studio' providing a studio space for the creation of things, with lots of discussion around the creations. This they felt resonated very strongly with their educational philosophy of experiential learning and they felt SL would not be suited to purely instructional approaches.

Finally, one educator commented on how the whole point of using SL was to do things that were not only pedagogically sound but were unrealistic to do in real-life.

He said "I didn't want to fall in the trap of building a building in Second Life that replicated something in real-life. So I've tried to produce things that would give you a learning experience that pedagogically would be sound, but not the sort of thing you could possibly or realistically reproduce in a real-life scenario." [Shimmer Island]

**In summary** we have found that educators understand that learning can occur in a wide variety of modes and SL spaces and locations. We also found that that the visual realism of a space can be strongly linked to the specific learning activity taking place. Also important to educators was having a clear pedagogical approach that can take advantage of the affordances that 3D virtual environments such as SL can express and enable learners to manage and take ownership of their work and the spaces that they work in.

I'll now hand you back to Shailey who will present the implications and conclusions of our work. Thank-you

**Thanks Idem. I will now present some of the implications of the results which Idem discussed and highlight some aspects on how this work can be taken forward.**

As we have seen from Idem's review of the results that learning in virtual worlds can occur in a diverse range of spaces.

Social spaces on the island encourage socialisation and informal learning through observations, interactions and collaborations.

So **one design rule** could be to consciously design social spaces near formal learning spaces for chance encounters and informal learning.

Although real-life-like scenarios and role-play situations are useful learning mechanisms in several domains such as art exhibitions, medical scenarios, or scenes of accidents, or for conducting pilot sessions within SL before they are conducted in real life (eg an exhibition).

However, SL does not provide the scope for understanding the 'unexpected' or 'what-if scenarios': what-if it rains on the day of the exhibition; what-if a lot of people (more than the number catered for) turn up on the day; what-if there is a power cut on the day, and so on.

When we started with this study, our focus was on the realism and non-realism of learning spaces.

However, the data has shown that it is not only the realism or non-realism of the learning spaces, but it could be the realism and non-realism of the objects and simulations within SL which could influence the design of learning activities and the learner experience.

PR and AR help to build familiar places, which could be useful for students and educators who are new to SL.

PR is suitable for training through role-play scenarios and simulations.

MR also supports the users' mental models from real world and enables user interaction within SL.

AR and MR, therefore, foster learnability and provide familiar spaces and objects which match with users' mental models of the real world, thereby enhancing the usability of the spaces and the user experience;

Fantasy in the designs of the spaces, objects and activities fosters creativity and can be fun.

MR and fantasy help to foster creativity and imagination.



Open spaces (OS) within SL are like virtual studios or workshops for designers, photographers and programmers.

Therefore, another **design rule** is that the designer or educator should consider the match between the level of realism, the learning activity, learning outcomes and student skills.

If the students were new to SL, moving from PR (comfort and orientation) to fantasy (when the students are more experienced) on a time-line would be useful.

Also, one learning space can have different levels of realism a computer motherboard (PR) near a station (MR) is suspended above an unsuspended train-track (F).

It was interesting to note that none of the educators whom we interviewed were keen to replicate the real-life campuses in SL.

They were focussed on the pedagogy and student experience and were not keen to brand the island in some way but were more interested in the actual learning that occurs there.

We also noted that all of them are clearly taking advantage of the 3D features and interactivity of SL and are tending towards more exploratory, experiential pedagogies rather than traditional instructional ones.

Also we came across examples which utilise the affordances of SL for learning activities which could potentially be dangerous (eg an accident scenario), expensive, or not feasible in real-life (learning to set up a one's shop and conducting retailing).

**These are some of the questions** that educators and designers may ask when designing for 3D learning spaces, interactions, and objects: are students expected to work on a task within a space; where will the resources and objects for that task be situated?; will the students be involved in building and scripting?; will the students work in teams?; how should the learning spaces be designed to support both formal activities as well as accommodate social spaces for informal learning?

**Another design rule** is: design for the unexpected: when running pilots of real-life events in SL, consider the what-if scenarios: how might you incorporate crowds of avatars, randomness, error, problems and pressure to consider the unexpected situations to enhance student learning.

### **Taking this research further**

These are three key areas that require further investigation and which, we hope, will contribute towards a better understanding the design of learning spaces in 3D VWs:

### **Influence of the designs of physical learning spaces**

For design of learning spaces in 3D VWs, it will be useful to draw out lessons from the design of physical learning spaces.

### **Principles of game usability and universal design**

Research is needed to make 3D VWs more accessible and usable.

There is a need to refer to studies in games usability (eg Isbister and Schaffer, 2008) to evaluate the fun, flow, playfulness, choreography, and engagement of games.

The principles of game usability and accessibility or universal design (eg Lidwell, et al 2003) should be applied for designing and evaluating 3D learning spaces.

### **Usability evaluations of 3D learning spaces**

In the literature review and in our empirical investigations, we haven't come across studies where the 3D learning spaces have been evaluated with users using traditional usability techniques such as observations, interviews and heuristic evaluations, or play-testing (playfulness and fun) in game environments.

For a positive user experience and for learner engagement, it would be useful to conduct usability evaluations with users or their representatives throughout the design and development of the learning spaces.

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Just to remind you that these results are based on educators' views alone; we have conducted empirical studies with students and designers too which we will share in future events later this year.

Please contact us if you have any queries or inputs for us.

Both Idem and I are very grateful to all the participants of our study.

I would particularly like to convey thanks to my SL mentor Esme Qunhua – presenting in SL on SL research has been a dream which she has helped to fulfil.

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