16 WAYS TO USE SECOND LIFE IN YOUR CLASSROOM: PEDAGOGICAL APPROACHES AND VIRTUAL ASSIGNMENTS

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This paper examines the emerging ideas for implementing the usage of Second Life as an educational tool in a wide range of subject areas. It is part of an ongoing doctorial researcher project being conducted at Lancaster University (UK). The majority of the information used to create these 16 pedagogical approaches was derived from a series of participative inquiries, personal observations, formal and informal interviews, surveys and ten months of documenting the perceptions of teachers and students using (and trying to use) Second Life as an educational tool. The majority of the data remains in raw form and is currently being analyzed. However, 16 pedagogical approaches have thus far emerged. Each section briefing explains the concept, illustrates the idea with examples and provides implementation suggestions.

1. Developing the *16 Ways* in order to Overcome Pedagogical Barriers

Many educational technologists would agree that poor utilization of the features of a technology will enviably lead to complacency with that technology and probably lead to it being either being abandoned, or worse, massively underutilized. Will virtual worlds be the next misused educational technology?

In the fall of 2007 through the summer of 2008, researchers at Lancaster University in the United Kingdom (UK) have been exploring the use of virtual worlds as an educational tool in several disciplines. Virtual worlds, such as Second Life, were considered an emerging technology surrounded by hype and growing educational expectations. A series of small pilot studies and formal and informal conversations with educators were conducted through participative inquiry, or Action Research, strategy. The desire to identify learning opportunities that fully utilized the features of Second Life, led to a series of brainstorming activities. These ideas were then experimented with on a small scale. Simultaneously, contacts were made with other institutions and ideas were compared.

Early on it became obvious that overcoming pedagogical challenges was, perhaps, of greater importance than overcoming technical barriers [Datasets 1,2,3,4][1]. In an effort to assist teachers who were genuinely interested in applying virtual world activities into their classes (but had no idea what to do) we created these 16 ways to use Second Life. Our research is ongoing and growing in size and complexity. However, we submit the following preliminary pedagogical thoughts. Each of the 16 approaches includes a definition, an example and suggestions from those who have tried, and sometimes failed, to implement them effectively. We use these 16 ways as a curriculum development tool so that educators, like you, have a starting point. It is our desire that these *ways* will illustrate the possibilities, encourage you and spark ideas of your own.

1.1. *Way One: Adding a Visual Element (Data Visualization)*

The first, and perhaps most obvious, feature of virtual worlds is their highly graphical nature. Second Life is open sourced, and thus, any user can create 3D objects. From a teaching perspective this means that the ability to demonstrate ideas in a visual form is now very feasible. Adding a visual element to your teaching can be accomplished in several ways. Visualization of otherwise abstract concepts and data visualization are two methods for utilizing the highly graphical nature of virtual worlds.

Examples
There are numerous examples for the use of visualization to teach complex and often abstract concepts. Many of which can be found in the hard science disciplines. 3 dimensional DNA strands, students creating complex chemical molecules, teacher created solar systems, mechanically accurate space ships, detailed and enlarged versions of microscopic organisms are all popular uses of the visualization possibilities [Dataset 4].

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[1] See appendix for descriptions of the raw data sets.

Social science usage of visualization is often based on theoretical concepts or datasets. For example, at Lancaster University (UK), accounting concepts such as balancing corporate books could be illustrated using a scale. When the student makes an entry on one side of the books, the scale tips; indicating that the books are no longer in balance. This is used as an analogy, or visual demonstration, of the abstract concept. The scale represents a Balance Sheet with the general ledger accounts shown through icons. In addition, the chart of accounts can be viewed in a variety of visual ways. The dataset can be shown as a 3D graph that moves in real time as the data is manipulated. By being able to visually see a list of general ledger accounts, make entries and watch what happens to the Balance Sheet; it is believed that students can make strong connections with abstract financial concepts. Despite attempts to develop this tool, it remains uncompleted and does not currently operate properly. However, students engaged in the attempts to develop it, state that they have learned a great deal from the process [Dataset 5].

Implementation Suggestions

You can use this concept in your class by building learning objects based on your subject topics. If you are unsure what or how to do that, then make their creation a class project. Pick only one or two specific concepts. From term to term you can have the next year's students elaborate on previous objects, or create their own, to add to the library of 3D interactive learning objects. The process of thinking how to illustrate and then creating the items is an excellent way to get students to think through the concepts. Such items also build your interactive library and give your students another resource for exam preparation. Developing the technical skills required can be pose challenges that must be addressed.

1.2. Way Two: Interactive Library

It is not uncommon to hear educational technologists express their concern that virtual worlds could revert to just another method for delivering content. A *talking head* is still a *talking head* regardless whether it is projected from a video, through an avatar or in the form of a real life lecture. Yet, many educators would agree that there is a time and place for talking heads and linear delivered content [Dataset 1]. However, the balance between asynchronous and synchronous, linear and nonlinear material can be difficult to find.

Examples

Several schools have started to build their own collection of learning objects and organize them in an interactive library accessible through their Second Life Island. Ohio University (USA) has learning kiosks where students watch short videos, take quizzes and play learning games.[2] Fontys Hogeschool-University of Applied Sciences (Netherlands) has similar learning stations where students can also contribute to a class blog, see examples of content discussed in their lectures and prepare for exams.[3] At Lancaster University (UK) educators are working to link freely available non-virtual world learning objects from sources such as JISC (UK),[4] The National Archives (British)[5] and other public domain libraries. Through links in Second Life, teachers can encourage their students to access a plethora of learning objects, articles and multimedia educational projects. We believe that the day is coming when you will be able to send your students to the virtual library as easily as you now send them to the real library. The difference is that the virtual one will be interactive and contain a host of innovative multimedia learning tools.

Implementation Suggestions

Your interactive library can involve a combination of different resources. From creatively displayed web links to instructional video clips, learning objects, text based documents, interactive spreadsheets, blogs, wikis and branching stories. Such libraries take time to build on your own. Consider establishing a team to develop it. Start by collecting what you already have in your school. Search data banks for subject specific learning aids. Search Second Life itself. Check with your national associations; The National Archives in Britain has free material, France, Germany, Holland and Sweden Governments all have free material (some of which are available in English), Films For Learning[6] has student created educational videos and Learn Out Loud[7] has podcasts of many classical pieces of literature. Libraries from other institutions are also a great resource. Involve your students in the creation or expansion of their virtual world library. And don't forget to try and include your actual librarians.

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[2] Ohio University: http://slurl.com/secondlife/Ohio%20University/83/202/27
[3] Fontys Hogeschool: http://slurl.com/secondlife/Fontys/121/121/27
[4] JISC: http://www.jisc.ac.uk/
[5] The National Archives: http://www.nationalarchives.gov.uk/
[6] Films For Learning: http://filmsforlearning.org/
[7] Learn Out Load: http://www.learnoutloud.com/

They usually have a variety of resources available to them. Librarians appear to make up a large part of the educators that are in the virtual world [Dataset 4].

1.3. *Way Three: Connection Device*

The second most obvious use of Second Life is that of a connection device. Not only are virtual worlds operating in real time, but they also can host material that can be accessed at a later time. Below is a list of the features of the many virtual worlds compared to other technologies that you may be more familiar. We use this chart to help explain what Second Life is and to help spark ideas for usage. This list is not intended to be all inclusive.

Table 1. A comparison for the communication features of virtual worlds. Created by Michele Ryan, Lancaster University, March 2008.

Communication Features	
Virtual Worlds have	**Which is similar to**
Real time text chatting-private	Instant messaging
Real time text chatting-group	Chat room
Delayed time text chatting	Email
Real time voice	VoIP / telephone & conference calling
Real time video stream w/ audio	Video calling
Searchable network tools	Social software / Web 2.0
Note card messaging	RSS / newsfeeds
Ability to create content	Forum, wiki, blogs
Record activities for later access	Podcasting
Uploading documents	File sharing

Events can be either streamed live or recorded for on-demand viewing. If you cannot attend a conference or a lecture, you and your students can still experience it. Second Life can be used as part of an e-learning based classroom or a space to meet and communicate with persons that you and your students could not otherwise connect. Face-to-face classes benefit when students can meet other people that could never come to their classrooms; such as guest speakers or subject experts. Students can also work in teams from different locations and with other schools across the globe [Dataset 4].

Examples
At Lancaster University (UK) some educators use Second Life to hold office hours so that others can reach us in a real time environment when we are not on campus. The Open University (UK) recently concluded a series of pilot studies, conducted in Teen Second Life, referred to as Schome Park[8]. This project brought together students from the UK and USA to work together. In addition, the staff was made up of a variety of teachers and researchers that were likely to have never collaborated without the virtual world [Dataset 6].

Implementation Suggestions
Consider your desired purpose for connecting via the virtual world. Set designated times for inworld discussions or offer group meeting times to watch a pre-recorded event. Invite guest speakers or make an alliance with a school that is teaching a similar course. Often school calendars and dramatically different time zones can cause scheduling conflicts. In such cases we found that recording the activities of a meeting on one side of the world, could then be played on demand for the other group when they met. Be flexible in your associations and involve your students in resolving these challenges [Datasets 4,7,8].

1.4. *Way Four: Role Playing Device*

A method that is often discussed in the literature is the use of virtual worlds for role playing activities. Virtual environments allow teachers to create fictional situations. They provide a safe environment where students can immerse themselves in a scenario that they may not normally be able to them. Safe practice means that students can take chances, make numerous attempts and fail without the real world consequences.

These can be synchronous activities either structured or not. The teacher can be part of the activity or simply assign it as an exercise. Usually role playing is used, in part, to develop or practice a skill. Therefore, study prior

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[8] Schome Park: http://www.schome.ac.uk/wiki/Main_Page

to going inworld is centered on the skill or skills desired. Second Life is then used as a way to practice the skill by taking on a role: fictional or not. However, it can also be used to give a more tacit understanding of the course material. In this case the role playing activities are intended to provide an experience.

Examples
One idea explored was for a Spanish language class. Students would meet in a Mexican style marketplace. They would take on roles such as shopkeeper, vendor and customer. In the virtual environment students could practice their foreign language skills by communicating with one another [Dataset 8]. On Harvard's (USA) Berkman Island law students practice their litigation skills[9][Dataset 9]. Educators in Singapore used space on the teen grid to conduct role playing lessons to practice negotiation skills [1].

Implementation Suggestions
Using Second Life for role playing means creating scenarios. Giving at least some structure and outlining the purpose of the role playing activity. Most role playing exercises have predetermined or assigned roles that the teacher gives to the students. In the case where skill development is the overall goal, the assignment should involve an area where students can practices extensively. An easy way to do this is for the teacher to simply instruct the students to visit a place where practicing the skill is likely to happen naturally [Datasets 1,2,8].

1.5. *Way Five: Simulation Device*

The difference between using Second Life as a role playing device and as a simulator is a distinct one. Simulations are often designed to allow the student to practice a process. Unlike role playing where the student is primarily practicing a skill; simulations allow the student to either concentrate on a process and/or their role in that process. In addition, simulations in virtual worlds can be seen as a combination of role play and data visualization. Simulations offer an excellent vehicle for teaching through trial and error. Decades of literature supports learning by doing concepts. And learning by doing it wrong, making mistakes in a safe environment and the ability to visually see the components of the process are aspects of how Second Life can be utilized.

Examples
Activities organized on Minerva Island, by Andrew Macías-Díaz for the School of Management at the University of St Andrews (Scotland) uses Second Life to teach film students how to arrange and hook up production equipment [Dataset 10]. Students move objects and simulate the connection of particular pieces of video equipment. Failure to connect them in the proper sequence with the proper items results in them not working. Correct connections allow the students to see the final arrangement functioning properly. Fontys Hogeschool-University of Applied Sciences (Netherlands) has a giant eyeball on their island. Enter the eye and you can experience what it is like to have severe vision problems or blindness [Dataset 11]. The virtual island of Ann Myers Medical Center (Canada) uses a combination of role play and simulations to train medical students [2]. Second Life simulations for medical purposes appear to be growing rapidly as evident by the recent surge of new medical education Sims affiliated with both North American and European institutions [Dataset 12].

Implementation Suggestions
Developing a simulation involves a great deal of planning. Students can offer some fascinating ideas. Ultimately, the key to a successful educational simulation is that it works properly. Adding behaviors to objects, scripts and conditions that involve contingencies is a complex process. However, these complexities in themselves are an excellent teaching tool. At Lancaster University (UK) we were not successful in creating our first actual simulation for Second Life. But the act of thinking it through, determining what should happen, in what sequence, in relation to what variables; successfully achieved the learning outcomes [Dataset 5]. Our hope is that in future classes we will actually be able to complete the simulation. Technical skill was the primary barrier at the time.

1.6. *Way Six: Games for Learning*

Within the virtual community, there is a great deal of controversy regarding whether or not Second Life, itself, is a game [3]. Technically speaking, by most modern definitions of the word *game*, it is not. It has no overall objective, does not have a beginning or ending and it is not designed to foster competition. Yet, it looks like a game and is often assumed to be one, especially by those who have never been inworld. However, the game-like appearance and functionality can allow for inworld learning games to be created and executed.

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[9] Harvard Extension School: http://slurl.com/secondlife/Berkman/204/65/25

Examples

While studying the concept of organizational cultures, business students from Lancaster University (UK) could participate in a Second Life scavenger hunt. Each group of students would search the virtual world to find items listed by their teacher. Students spend time on various islands observing and comparing the different cultures. This information is then used as a scaffolding tool to compare the concept of business cultures to that of the cultures found in Second Life [Dataset 8]. At Fontys Hogeschool-University of Applied Sciences (Netherlands) students can play a knowledge game. Similar to a question and answer game except that avatars must move to a different location before answering and before the time runs out. The scramble to move against a clock while trying to think of the correct response is both fun and challenging [Dataset 11].

Implementation Suggestions

Learning games can be created from scratch by the teacher or done as part of the course itself. The process of planning and creating a game will get your students thinking through the content material in greater detail. However, if time does not permit, you may be able to find games created by others that can serve your purposes. We have seen courses that assign students to visit a public island and participate in a game that was created by another institution. In these cases the teachers did not accompany the students. After participating in the learning game students were required to write an essay about their experiences and tie the subject content into the paper by answering several questions proposed by the teacher [Dataset 4].

1.7. *Way Seven: Soft Skill Development*

Decades of research shows that soft skills, or social skills, are best developed through interactive practice [4]. In the virtual world these skills can be practiced in a variety of ways. In general, the concept of skill development in Second Life is applicable when the pedagogy is not task-oriented. In other words, the assigned virtual task is not the learning objective instead it is a method for practicing a skill. If however the skill can be directly related to the task then the learning experience may be even more powerful.

Examples

As mentioned earlier, role playing is one way to practice skill development. Additionally, Second Life can also be used to develop skills in a less direct manner. At Lancaster University (UK), the development of soft skills is seen as a benefit of the virtual world regardless of the task at hand. Although students can also practice particular behaviors, often the learning exercise has no obvious link to the specific learning outcomes. Students in an introduction to management course could be assigned the task of creating interactive virtual objects that showcase a specific theme. Students with no prior Second Life experience have to locate the resources, analyze the task, develop the required skill to complete the task, coordinate the activities of their teammates, organize the information obtained, and work collaboratively to accomplish the task. The end result is that students embark on a process of inquiry to discover, learn and communicate the necessary technical skills to perform something completely foreign to them. The real life analogy is that in the world of business, managers, often have to investigate problems, make decisions and implement strategies in areas where they have no practical knowledge. Second Life provides a foreign environment with enough resources and a small enough learning curve, to enable students to experience what it is like to be a real world manager [Datasets 4,8].

Implementation Suggestions

Begin by identifying the soft skills that your students need to practice. This may include less tangible skills such as critical thinking, problem solving, team building, and collaboration. Assign a task that is easy enough for the students to accomplish based on their inworld experience; yet difficult enough that the execution of the task will require them to use the skills you desire they use. In the virtual world when students do not know how to perform a task, they often figure it out through collaboration and end up practicing these skills along the way [Dataset 4].

1.8. *Way Eight: Research*

The virtual world of Second Life offers a plethora of research opportunities when used as a backdrop for the topic being researched. Due partly to the fact it is an open environment with a large number of participants engaging in a diverse range of activities. Teachers wanting to use Second Life as a research tool can assign students to study various aspects of the virtual world.

Examples

Students at Lancaster University (UK) can learn about economic topics by studying the inworld economy. The Second Life currency exchange resembles similar aspects of a real world currency. Sociology students can create avatars of a different race or gender and examine their experiences. Anytime the subject being studied is

represented as a natural part of the virtual community, students can study it from a first person point of view [Dataset 4].

Implementation Suggestions
Depending on your subject area, there is probably an area of Second Life that students could study. Another interesting idea was for students to simply explore the virtual world and look for analogies to a specific topic in their field [Dataset 8].

1.9. *Way Nine: Virtual Tourism and Field Trips*

If you could take your students on a field trip anywhere in the world, where would you go? In Second Life there is a good chance that you can: and if you can't find it then you can probably create it. Image the amount of insight and understanding of the subject knowledge your students would gain from creating such a place.

Examples
The amount of real life places to visit in Second Life needs no explanation: Vassar College's Sistine Chapel, Louvre Museum, Space Flight museum, Paris, Morocco, Dublin, New York, Austria, Australia, the list goes on and grows nearly every day [Dataset 4].

Implementation Suggestions
Students can visit them as a class or on their own or in designated teams. Students can be required to provide a report, a presentation or an essay about their experience, if desired. Using virtual worlds to visit places that would not be possible in the real world is an excellent way to help the students thinking critically and make analogies to what they are learning in class. Weather you locate the places to visit, assign your students to find them or create them as your class project; Second Life for virtual field trips bring a new level of experience not possible with other forms of educational media [Dataset 4].

1.10. *Way Ten: Social Device*

Second Life is a social space first and foremost. In this context, you can use it to hold social activities. These events can be excellent ice breakers to help team members get to know one another. It has an added benefit that it will inevitable also help students practice communication and other social skills. These social events break tensions plus they are a lot of fun!

Examples
Throughout the Open University's (UK) Schome Park project on the teen grid, teachers, researchers and students gathered together for various social occasions. Avatars shared gestures, students played music and sang. It added a lighter atmosphere and helped newbies feel like part of the group. At the end of the third phase of the project, a going-away party was held. Avatars took turns giving speeches, dancing and saying goodbye [Dataset 2]. While at Lancaster University (UK) starting new people out together proved to be a great team building experience as well a fun social activity [Dataset 1].

Implementation Suggestions
Creating avatars and going inworld for the first time is an excellent class project. Even students, who were physically in the same room, enjoyed going through the discovery process together. They helped one another and the sharing of the newbie experience helped overcome reluctances. It is not uncommon for schools (especially those in Europe) to have technical barriers that prevent account creation from within the institution. In this case, information could be gathered in advance and accounts created off campus. The participants then meet in a campus computer lab and log on for the first time all as one group. Let your students play and experiment with their avatar's appearance and keep the first sessions very socially focused. The main goal for the first class is to simply help students get more convertible in the virtual world. Students appeared to connect strongly as a group when they logged on together for the first time. Later look for any excuse to have a virtual party. It does wonders for the group's cohesion [Datasets 1,4].

1.11. *Way Eleven: Create Anonymity*

Anonymity can be a potent tool for helping people feel empowered to take risks because of the lack of consequences associated with actions taken in a virtual world. Have you ever wondered what your students would say about your class if they could hide behind an avatar? Second Life can be used as a place where students can express themselves more honestly, talk about touchy or confidential matters, take social risks, and

overcome fears. Nearly any situation, where anonymity enhances the quality of the communication, virtual worlds can be valuable.

Examples
At several European institutions, Masters and PhD students can meet to discuss problems they are having with their supervision. Masters degree students at a French business school met through rotating avatars to discuss their dissatisfaction with their program[10] [Dataset 7].

Implementation Suggestions
Although at Lancaster University (UK) we have not yet tried it, we cannot help but wonder if course evaluations and focus groups conducted inworld would yield the same results as paper surveys. Determine the type of anonymity you desire. If complete confidentiality is required then consider providing generic or rotating avatars. This means that you have a slate of user names and passwords that are used for one purpose and then reused by a different person. No one person can be associated with one avatar. Be sure to provide a facilitator that can address the problems that may arise. And consider recording the communications if the participants will allow it [Dataset 4].[11]

1.12. *Way Twelve: Machinima Creation (Video Filmed Inworld)*

The creation of an inworld film, or machinima, requires a plethora of project management skills. Using machinima as a class assignment will force students into planning, organizing and structuring their content based message. It can be used as an assigned task, part of an e-portfolio or added to traditional PowerPoint style presentations. However, machinima creation can be too complex for short courses or for novice inworld students.

Examples
Students as Lancaster University (UK) actually worked around the concept of machinima by simply placing a video camera in front of their computer screens. This happened, partly due to their ignorance of screen capturing technology (and our neglect to inform them) and partly due to technological barriers associated with Second Life's inworld filming capabilities when running on Microsoft PCs [Dataset 13].

Implementation Suggestions
Carefully consider the learning objectives and purpose for using machinima. Take into account the skill level of your students and their inworld experience. Make sure there is enough time in the course to require your students to create a machinima. Clearly outline the grading rubric, content requirements and creative expectations. Provide them with the tools they need to complete the project, including examples of other machinimas, third party screen capturing software and basic film production (or project management) strategies. Showcase their work when it is completed. Students who completed the machinima projects expressed disappointment that their work was only viewed by the instructor [Dataset 4].

1.13. *Way Thirteen: Recruitment*

Arguably, Web 3D appears to be the next generation of the internet. We are progressing from Web 2.0 to a highly graphical internet where fellow web surfers can be seen as avatars [5]. There is a growing sense of urgency, especially within the educational sector, to establish a 3D web presence [Datasets 1,4,6,7,12]. Just as we saw in the early days of the original internet, we are starting to see in Web 3D development. Schools, who have developed their islands and use them regularly, find that Second Life is a valuable tool for recruitment [Datasets 7,12]. Islands are being used to promote schools in general, specific courses or programs and research projects.

Examples
Nine institutions of higher learning in the European community battled for the right experiment with virtual worlds. Four of the nine were repeatedly denied funding for island development intended for educational purposes. Two schools were offered funding contingent upon their ability to recoup the expenses. Three other intuitions secured funding for pilot projects only to have their virtual spaces taken away from them at the end of the projects. In all nine cases, when the ability to use Second Life as a recruitment tool to showcase the institution was suggested, the funding became easier to obtain [Datasets 7,12].

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[10] These schools have indicated that they prefer to remain anonymous.
[11] Be sure not to infringe on the *Terms of Service* agreement with Linden Lab.

Implementation Suggestions
Establishing a Web 3D presence is the first step in a school's island development. Although the literature on Second Life education often condemns the replication of real world campuses, institutions often start there. This helps provide some of the stakeholders with a more tangible way of understanding why their school is using the virtual world. In Europe, most institutions are supported entirely by government funding and often have tight restrictions on how their funding can be used [Dataset 12]. Providing an island intended for student recruitment is a somewhat easier way to convince governing bodies to allow Second Life development. Once the island is established then it can take on other, perhaps more educational, uses.

1.14. *Way Fourteen: Build Awareness and/or Promote an Event*

As we travel around in Second Life we often come across areas that are promoting a specific event, rising money for charity or promoting a social agenda. These strategies can be useful in your classroom.

Examples
Hope University in Liverpool (UK) hosted a series of *open-days* (built by the students) to engage in conversations about issues their university [Dataset 14]. Many schools showcase their student's work, advertise up and coming real events and support inworld charity islands. Another idea was to let avatars measure their carbon footprint in order to build awareness of environmental issues [Dataset 8].

Implementation Suggestions
Let the students decide how they want to use the virtual world. They can search and locate examples of other places or create their own space. Students can also prepare adverts for live events streamed inworld. Most students seemed to like to have their work displayed and promoted even if only at the school level [Dataset 4,13].

1.15. *Way Fifteen: Building for the Sake of Learning How to Build*

One of the wonderful features of a virtual world is the ability to create content in an open source environment. The possible creations by combining prims, textures and scripts are limitless. If you teach a computer science course, then Second Life can be your nirvana.

Examples
Ideas for applications in computer science classes include topics where students need to learn about 3D rendering, scripting, spatial relationships, animations, database and grid management issues and using third party software application for Second Life purposes such as Photoshop, Illustrator, video and audio capturing programs [Dataset 8]. Temasek Polytechnic (Singapore) uses Second Life to explore the concepts of data structures and algorithms [6].

Implementation Suggestions
If you teach a class that requires the students to learn about the theoretical foundations of computing concepts then you can use the virtual world to link these concepts. As stated earlier, learning by doing is a powerful pedagogy. The nature of Second Life offers a valuable way to apply and practice using the various technical features. Determine the learning objectives that must be met prior to your inworld activities. After these topics are covered, engage your students with the use of Second Life. Face to face, computer lab run classes provide a collaborative atmosphere. We suspect that this may be a key success factor when teaching complex computer science concepts [Dataset 8].

1.16. *Way Sixteen: As an Open Learning Environment (Virtual Action Learning)*

This is perhaps the most fun and often the scariest way to use Second Life. Scary in the sense that it is outside the comfort zone of many educators [Datasets 1,2,3,7,12]. It is based on the open learning concepts and theories of action learning (i.e.: Revens). Virtual Action Learning (VAL) draws from experiential learning (i.e.: Kolb & Dewey), reflective problem solving (i.e.: Schon), andragogy theory (i.e.: Knowles) and combines them with e-learning pedagogies (i.e.: McFadzean) [7]. Dickenson, Pedler & Burgoyne define VAL as "…action learning which takes place in a virtual environment… via a range of enabling, interactive and collaborative technologies" [7, p3]. In Second Life, VAL can be used as pedagogical strategy. In it's simplest form it involves getting your

students to participate in the decision making process regarding how to accomplish the learning objectives. This is done through cycles of learning sets that involve inquiries, action and reflection.

Examples

At Lancaster University (UK) we have spoken to several educators who are doing some form of this pedagogy [Datasets 2,4,6,7,8,12,14]. We have found few examples of VAL implemented 100% into a course. Instead, educators may perform a small open or active learning session. However, to fully capitalize on this method, we believe that educators need to fully commit to the concept and conduct their entire course using the concept of VAL.

Although few examples of Second Life courses used VAL exclusively, or used a different name to describe their work; we did find some schools that were committed to the concepts of VAL. The University of Southern Queensland (Australia) reports using Second Life specifically for action learning sets.[12] The Open University's Schome Park project used a similar pedagogy [Dataset 6]. We suspect that there are many other schools using Second Life in this capacity. Currently, at Lancaster University (UK), we are preparing to perform a fully integrated a VAL pedagogy using Second Life as an educational tool.

Implementation Suggestions

Whether you plan to implement a pure from of action learning through participative inquiry, or simply use some its features to engage your students; you will likely want to have a rudimentary understanding of the theory and concepts of action learning sets.[13] Being transparent about the learning process is essential. Explain your learning objectives and ask your students what they would like to know in order to accomplish those goals. Discuss how they can use Second Life to meet them. Execute those ideas and then have your students reflect upon the process and make suggestions for improving them. If your students have no previous virtual world experience you may want to include basic skills of the technology in your targets. Be open with your students and let them dictate the direction. Your job is to facilitate the achievement of the learning objectives. Include how they will be assessed as part of the decisions they need to make. Those who have experimented with action learning say that it is rich and amazing educational experience [8].

1.17. Conclusion

Developing these 16 ways to use Second Life has been an enlightening experience. Further research at Lancaster University (UK) will expand on these ideas and provide more empirical evidence in the years to come. We have found many enthusiastic educators (with good intentions) that had not yet taken their students inworld. It is our desire that these 16 pedagogical approaches and our experiments with virtual assignments will empower them to take that virtual jump. We believe that by utilizing the features of Second Life that virtual worlds will eventually find their place in mainstream education. Our hats off to all the *Lone Ranger* educators who continue to push for improved educational quality through the use of emerging technologies.

Appendix: Data Set Descriptions

Dataset 1: Documented conversations, both formal and informal, workshops and inworld activities involving the volunteer group of educators at Lancaster University. This group later became known as LUSLUG (Lancaster University Second Life Users Group). October 2007 to present.

Dataset 2: Semi-weekly inworld conversations with educators and researchers participating in the Schome Park project met inworld and communicated via email. February 2008 to present.

Dataset 3: Formal interviews with 4 educators who had dropped out of the Schome Park project. April 2008 to May 2008.

Dataset 4: Ideas derived from semi-daily journal entries made from observed inworld educational activities from a variety of institutions involving students, teachers and researchers. October 2007 to present.

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[12] University of Queensland: http://www.leagueofworlds.com/action
[13] Some brief guidelines for action learning can be found at: http://www.studygs.net/actionlearn.htm

Dataset 5: Focus group consisting of first year accounting students with no prior Second Life experience. Met in person at Lancaster University. May 2008.

Dataset 6: Weekly ethnographic journal entries documented while volunteering in the Schome Park project from January 2008 to May 2008.

Dataset 7: Documented conversations, inquiries and discussions with virtual educators at European conferences between January 2008 and July 2008. In person followed up via email and inworld communications.

Dataset 8: Documented extensive brainstorming sessions with specific topics explored. Ideas then further explored with members of LUSLUG; experiences shared and ideas investigated. Met both in person and inworld from October 2007 to present.

Dataset 9: Personal observations and informal conversations with participants on Berkman Island between November 2007 and June 2008. Communication via email and inworld.

Dataset 10: Personal conversations, in person, inworld and via email with Andrew Macías-Díaz for the School of Management at the University of St Andrews. Contactable via: http://www.askin.tv. From May 2008 to present.

Dataset 11: In world exploration of school's island and in person conversations with Albert Sleutjes and Paul Dirckx of Fontys Hogeschool. From July 2008 to present.

Dataset 12: Usage Survey #1. Mixed-method survey conducted by Michele Ryan, concluding in July 2008.

Dataset 13: Personal observations of learning activities, inworld exploration of course project and formal interviews with participants in Masters course on Computing & Psychology (Lent term 2008) at Lancaster University.

Dataset 14: Documentation of personal conversations, inworld exploration and ongoing collaborations with educators and students at Hope University in Liverpool. From October 2007 to present.

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