On the Road to Virtual Europe - Redux

Andy Pulman
School of Health & Social Care, Bournemouth University, UK
apulman@bournemouth.ac.uk

Abstract: Virtual Europe is a web-based European community from which health education scenarios may be accessed for learning and teaching purposes. Featuring a map giving access to country specific resources, it is populated with different cultural case studies allowing contrasts between cultures to be examined. For example, a student could evaluate the differences between UK, Belgium and Dutch approaches to the care of a patient in a particular situation. The project is initially funded by the Consortium of Institutes of Higher Education in Health and Rehabilitation In Europe (Cohehre).

This paper offers a unique view on the benefits and limitations surrounding the development and implementation of a European health based virtual community. How will it facilitate the elimination of barriers for international mobility of students and staff? How easy is it to integrate into differing European health curricula? How does it compare to the experiences offered by new virtual environments?

During the first year, the pilot version of Virtual Europe was created incorporating cardiac and burns case studies. During the second year of the project, the aim is to refine the pilot and incorporate further case studies. During the third year of the project, Virtual Europe will be utilised within partner institutions as a learning and teaching tool. The project team are working to evaluate the user-friendliness of the system on an on-going basis encouraging feedback from the students and academics that will use it. Tutorials will be used to evaluate how successfully lecturers are able to utilise and integrate it within their curriculum. Evaluation will be iterative and formative, with feedback used to identify potential changes that will be incorporated into subsequent pilots, group sessions and system enhancements.

The paper presents a cogent and stimulating analysis of an e-Learning virtual health education project which is interprofessional in outlook; interdisciplinary in approach; intercultural in background; interactive in design and international in scope.

Keywords: interprofessional, simulated community, health education, Virtual Europe, intercultural, international

1. Introduction

Virtual Europe is a web based virtual health community from which educational scenarios may be accessed for learning and teaching purposes. The project is initially funded by the Consortium of Institutes of Higher Education in Health and Rehabilitation in Europe (Cohehre). Cohehre was established with the support of the European Commission and within the framework of the Erasmus-programme. The consortium is a non-profit organisation and was formed as the result of a European congress of 8 Institutes of Higher Education in Health and Rehabilitation in 1990. The organisation was established on the principle that adding a European dimension to the educational activities of its members would enhance the development and quality of higher education for health care professions. Two of the goals of the organisation are co-operation in educational innovation and research and facilitating the elimination of barriers for the international mobility of students and staff, through joint efforts to improve the accessibility of curricula and courses. Cohehre offers its members the chance to come together in order to stimulate change in the European and home environment with regard to health professional education. Through its activities it seeks not only to disseminate information that is pertinent to its constituency but also to aid mutual understanding of the issues and professional development of its membership. One of the ways it achieves this is through supporting project work. The Virtual Europe project is set within a European context and aims to meet Cohehre goals by being interprofessional in outlook; interdisciplinary in approach; intercultural in background; interactive in design and international in scope. The development of Virtual Europe provides an opportunity to work on a European project, which seeks to provide an innovative virtual learning resource to Cohehre partner institutions. Dissemination is a key component of the project with this paper being the second in a series of publications - a positioning paper, Scenes from a Virtual Europe having already been published (Pulman 2006). This paper provides an interim progress report on the challenges and opportunities surrounding a project that aims to benefit Cohehre members and their students. How will it facilitate the elimination of barriers for international mobility? What are the challenges of developing and integrating it within different European health curricula? How does it compare to the experiences offered by new virtual environments?

2. Background

The School of Health & Social Care (HSC) at Bournemouth University has a long standing reputation for providing student-centred, innovative programmes of education that prepare and develop health and social care practitioners. As part of the development of an interprofessional curriculum in health and social work education, a web based simulated community - the Wessex Bay Community - was created for use during the academic year 2005/2006. This community was populated by health and social care users and providers, living and working in a seaside town - Wessex Bay - and a rural community - Tarrant Abbas. The purpose was to act as a learning resource for geographically dispersed students and lecturers to facilitate interprofessional collaboration and learning around a variety of health and social care scenarios. The creation of case studies and their association with a property within the town or rural area aimed to create a communal environment. The community was developed primarily with an educational philosophy underpinning it and the process of learning was similar to creating cases for classroom discussion. An academic takes ownership of maintaining a case study with the ability to update it online with timely or relevant information. Each case study encourages academic activity through the publication of relevant background information which could include medical history, employment details or family circumstances. This information enables staff to publish materials aligned to the appropriate student year and academic level. Authors can prepare sequential information in advance and submit it together or on an episodic basis within a particular date range. Students as part of the curriculum are required to view individual profiles, brainstorm ideas proposed within them, evaluate key discussion points and draw conclusions from those discussions. Course communication focuses upon different family members, facilitating learning and teaching of students and staff through interprofessional collaboration.

Virtual Europe takes this concept and applies it to a European model. For example, Tracey Maher lives at home with her mother Pat and her brothers Wayne and Ricky. Her father is currently serving a sentence for aggravated burglary and is currently in prison. Tracey attends the local high school, where she met her boyfriend Danny who is in the sixth form. Having confided in Amy, one of the youth leaders at the local youth centre, Tracey visits her doctor with Amy and finds out that she is 8 weeks pregnant. Tracey tells her Mum who 'goes mad', bans Danny from the house and tells Tracey she's got to 'get rid of it'. Danny tells Tracey, 'they'll manage' and that he was going to ask her to marry him anyway. However when he asks his Mum if they can live with his family, she says there is no room. Tracey starts to be absent from school and when she is there, staff notice that she is very tearful. On the spur of the moment Tracey decides to see the School Nurse Simon, during one of his drop-in sessions. She tells him her story and says that she doesn't know what to do but thinks she wants to keep the baby. After some discussion Simon arranges for Tracey to meet with a counsellor at the local pregnancy advisory centre. He then asks if he can share Tracey's situation with the family's social worker and she agrees. The social worker then sets up a meeting with Tracey's permission, to explore ways forward. From this scenario a variety of learning tasks could be considered. One might include a meeting with the family, Danny, a social worker and other interested parties to explore ways forward in which role-play is used with students either in a face to face environment or via a discussion forum. The participants are asked to role-play one of the characters in the community with at least one observer of the process. The social worker acts as chairperson for the group and provides a brief summary of the content whilst observers are responsible for providing a summary of the 'process' and feeding back at the following plenary session.

This scenario and the discussion role-play that follows can be easily relocated and replicated in other European settings, so Tracey becomes Michelle in Belgium and Eva in Holland. However, each individual country has a unique cultural approach to health and social care issues highlighting diverse methods of patient treatment, care and education from the early stages of diagnosis to rehabilitation. The Virtual Europe model allows comparisons and contrasts between cultures to be examined (in addition to individually within each countries curriculum). One such example concerns the subject of euthanasia. Belgium and Holland are the first countries in the world that have legalized euthanasia and assisted suicide. However, not only are there fundamental differences between Belgium and Dutch law, but also the public debate and values underlying the debate show dissimilarities. In Holland the debate took more than 20 years and the subsequent law on euthanasia reflected an existing medical practice. In Belgium, the parliament came to vote on the euthanasia law after only half a decade of debate (Schotsmans and Meulenbergs 2002). In the UK, euthanasia is classified as a crime. Doctors may give morphine or other medication to relieve pain or distress, which may have the effect of shortening life, but it is illegal to give drugs with the deliberate intention of ending someone's life. Assisted suicide, where the individual is given the means to administer fatal drugs themselves, is also illegal in the UK (BBC 2007). A case study in this area could be compared and contrasted to other European approaches to this emotive issue, which is one way of helping to

internationalise the curriculum. This might be particularly beneficial for raising awareness of different workplace methods, which might also be useful before students went on international placement or if they decided to work abroad in their future career.

3. The pedagogical design

As discussed in Scenes from a Virtual Europe (Pulman 2006), for the pedagogical design of Virtual Europe, our main strategy originally concerned encouraging a deep learning experience by following a Constructivist approach incorporating Biggs theory of Constructive Alignment and acknowledging his concept of Educational Technology (Biggs 2003). The strategy would integrate Gibbs strategies for improving the quality of student learning (Gibbs 1992) with Biggs elements of good teaching (Biggs 1989). It would also consider Laurillard's model of the conversational framework (Laurillard 2002). This is where learning strategies are focused on engaging students actively through structured activities and realistic tasks to encourage learning by doing (Kolb 1984), with opportunities for reinforcement and consolidation through reflections shared and feedback from tutors and peers. However, as a young and relatively new area, it is expected that this basic pedagogic model will continue to evolve in line with advances being made in researching new models of learning with virtual communities.

The 2007 Horizon Report (NMC and Educause 2007) suggests that the educational use of virtual worlds is already underway and growing and predicts a time-to-adoption horizon of two to three years. At present, Virtual Europe aims to facilitate student enquiry and effective learning within a flat two-dimensional (2D) environment using individual case studies for analysis and problem solving. The scenarios can be managed and manipulated to engage students in a variety of online and face-to-face learning activities including case analysis and decision-making, discussion and debate, role play, and collaborative problem-solving. As educators and developers increasingly look towards a three-dimensional (3D) perspective and the technology continues to mature it is logical to consider how this changing pedagogical framework might be constructed to encompass Virtual Europe. One such group aiming to research new models for virtual world learning is the SEAL project (SEAL 2007). The aim of this project is to explore viable and preferred futures for learning in formal education through and with the Second Life environment. Second Life is a computer-based, simulated multi-media environment that runs over the web allowing users to interact with others via their own personal avatar – a graphical self-representation of themselves (Kamel Boulos et al. 2007). SEAL aims to create communities of learners, teachers, technologists and creative practitioners who will interact in the Second Life environment. The events will focus on the 'freeing up' of mindsets and working creatively to develop practical, sustainable, engaging and advanced approaches to using Web 2.0 technologies for learning and teaching. Plymouth University have also recently produced an overview on the potential of 3D worlds in medical and health education. Within the overview, they suggest three implications for practice (Kamel Boulos et al. 2007), which could be seen as relevant to the future pedagogical evolution of Virtual Europe:

- Thinking 'out of the box' rather than purely replicating real life and classrooms in 3D virtual worlds

- The need to focus and capitalise on what 3D virtual worlds are best at and determining and disseminating the optimum formulae for blended 2D and 3D media approaches

- More research being required to make 3D virtual worlds more accessible and user friendly and the need for learners, developers and educators to upskill in competencies to make effective and efficient use of them.

4. The interactive design

In Scenes from a Virtual Europe (Pulman 2006), we referenced other interactive resources that had helped to inform the initial developmental processes. In the area of learning resources on the web, the DIPEx project (DIPEx 2007) was highlighted as it provided a variety of personal experiences of health and illness aimed at clients and practitioners. Users are able to watch, listen to or read transcripts of client interviews and find information on treatment choices and support and this resource can still be considered a good example of what can be achieved in conveying a client experience in order to educate. Similarly, Nesta's report on Savannah (Futurelab 2005) continues to highlight an important point - an increasing awareness that young people's digital cultures are as likely to be shaped by interaction with mobile and games technologies as they are by PC applications and that all educational settings including Higher Education should start to engage with these tools. This growing recognition that the areas of simulation, online communities and virtual worlds are becoming seen as important learning and teaching tools of the future has

also been reflected in this years funding of research grants by Eduserv (2007) and in many papers and reports. Examples include Learning in Immersive Worlds (De Freitas 2007), Unlimited Learning - Computer and video games in the learning landscape (ELSPA 2006) and the 2007 Horizon report (NMC and Educause 2007). This acknowledgement shows a clear convergence between meeting the deeper learning needs of students and tutors with the provision of well-designed interactive experiences, experiences that engage users and maximize the conversational possibilities between themselves and the software. Virtual Europe aims to harness these experiences within its interactive design. Navigation is provided through a variety of options. A profile can be located through either a map - via the house of the resident - or other location (for example, a hospital ward). It can also be located from a list of all residents or by keyword searching within a particular country, area of interest or condition. Profiles of characters contain their name, age, gender, keywords associated with the character relating to their circumstances and a brief descriptive profile detailing their current situation and past history as appropriate. Narrative episodes can then be attached to individual character profiles. Episodes can adapt the temporal duration of characters by moving time forward or backward depending on the conditions and situations they wish to represent. They can also be time released over a period of weeks or months so a complete narrative pathway with a point of closure can be presented over the course of a short unit or longer year of study as required. For example, a young mother about to give birth to her first child one week - giving rise to one scenario - had her life moved forward by two years for the second week. In the second scenario she had lost one parent, now had two young children and was faced with the issue of having to move away from Wessex Bay - due to her husband moving jobs - leaving an elderly parent behind. Characters can also be moved to different locations around the community to reflect particular situations and circumstances such as admission to hospital.

However this experience is currently a 2D one which offers limited interactivity when compared to other more complex interactive experiences available to a user in 2007. Owners of Nintendo handheld consoles are offered increasingly detailed simulated experiences from the cute virtual world of Animal Crossing: Wild World to the challenge of becoming a doctor operating on patients in increasingly stressful situations in Trauma Centre: Under the Knife. The Sony PlayStation 3 will soon include an environment called Home where players can create avatars and wander through a seamlessly integrated 3D world filled with other owners (Kohler 2007). The increasingly intricate design and programming of these games, has led into other uses for virtual experiences such as the use of a virtually simulated environment to treat military personnel returning from Iraq. Created by a clinical psychologist, the new therapeutic approach to treating post-traumatic stress disorder is based on the computer game Full Spectrum Warrior (Dixit 2006). In Second Life, psychiatrists have created a visualisation of the hallucinations associated with schizophrenics. The Virtual Hallucinations building contains a closely researched recreation of visual and aural hallucinations, based on interviews with real people with the condition (Linden 2004). Within this virtual world, another avatar represents a medical student who has agoraphobia but is able to see himself in the simulated 3D environment, and feels he can become more comfortable with unfamiliar open spaces (Aquacade 2007). Behind the avatar Wilde Cunningham are several individuals who live with cerebral palsy - physically disabled with all but one confined to a wheelchair – who within Second Life are given the opportunity and freedom to move, fly and interact with others which doesn't exist to them in their real life environment. Elsewhere, American doctors and nurses have been able to experience the world of an undiagnosed heart attack patient through the Heart FX Pod. As well as encouraging earlier diagnosis by doctors, AstraZeneca hope the device will help specialists to be more understanding of patient needs (Aldhous 2006). Finally, in World of Warcraft, an online Dungeons and Dragons descendent, a group of virtual explorers were recently infected by a virus. Several died but the survivors spread the plague to surrounding areas. In the real world the online outbreak is now being studied by scientists to see what it can teach about the way humans respond to the fear of epidemics (Macintyre 2007).

We are not really that far removed from an ability to create deeply immersive 3D interactive simulations as the web tools and environments are already in place to create exciting global health education experiences. But whilst the possibilities for this type of experience are endless, the realities of producing quality educational experiences of an interactive nature require the same levels of work, financing and resourcing as professional software to become fully realised worthwhile resources and they must also be pedagogically sound. The limitations of the format must also be acknowledged. Wand (Reiser and Zapp 2002) contends that even a complex simulation is based on a claim demarcated by fixed rules whilst individual human life is surrounded by "authentic boundlessness, in which interaction can entail a corresponding degree of unpredictable consequences". In terms of the interactive design of Virtual Europe, we need to consider how the project should align itself with or within these new virtual environments. Should we be looking to move it into a 3D environment and if so how would this integrate into our existing prototype in a pedagogically

satisfying way? Or is it better to sit outside of any proprietary system such as Second Life and continue with our current model during the project lifecycle.

5. The project lifecycle

A work in progress report on the development of the Wessex Bay Community was presented to members of the Teaching & Learning Interest Group at the 2005 Cohehre Conference. Subsequent discussions highlighted the benefit of adapting the approach and ideas of a simulated community to focus on a wider international perspective. At the 2006 conference, the team members met to discuss a possible project idea, subsequently submitted to the Cohehre council and approved in July 2006. Cohehre funding for the project covered three years from this date to develop and refine a working pilot of Virtual Europe, hold regular update meetings and evaluate and disseminate findings. Work on developing the pilot Virtual Europe commenced in partnership with participating institutions in July 2006. During the first year, the aim was to create a prototype incorporating a case study from each partner with HSC also concentrating on the development of the prototype system. The first iteration contained a burns scenario from Erasmushogeschool, Belgium, a cardiac scenario from Hogeschool Amsterdam, Holland and a burns scenario developed by a Lecturer Practitioner in Burns and Plastic Surgery from HSC. The project team then met during November 2006. At this meeting a number of possible virtual ideas around simulation and health experiences were explored, and the initial case studies were walked through with discussion focusing on how they could work more effectively.

A presentation demonstrating the Virtual Europe prototype and a summary of the project development so far was presented to attendees of the 2007 Cohehre conference. As a result of these presentations, the project now has further interest and possible commitment from university faculties in Denmark, Norway, Sweden, Portugal, Bosnia-Herzegovina and Finland with potential areas of interest encompassing midwifery, continence care, rehabilitation, low back pain and palliative care. There is also the possibility of bid for European funding relating to the Seventh Framework Programme for Research and Technological Development (FP7). During the second year of the project, the aim will be to refine the prototype version of Virtual Europe and incorporate more case studies from each interested partner. The two existing project members are looking to amend their existing cases and develop individual uses for them within the Belgium, Dutch and UK curriculum. They are also seeking to test out the prototype, which will highlight any problems with the system and inform any new requirements. Partners who registered an interest at the 2007 conference have been requested to add two new cases concerning their preferred areas and to develop individual uses for them in their own curricula. The second iteration of the prototype will then be demonstrated at the 2008 Conference. During the third year of the project, the aim will be to utilise and evaluate the use of Virtual Europe within partner institutions curricula as a learning and teaching tool, based on the requirements for use identified in the second year. There is also the scope for internationalised use of other cases created by project partners.

As a result of a successful bid to the Health Science and Practice Subject Centre of the Higher Education Academy (HEA), it has been possible to evaluate in depth the student and staff experiences of interprofessional education at HSC by examining how students and staff made use of the Wessex Bay Community and the range of learning objects associated with it. This project - a virtual practice community for student learning and staff development in health and social work interprofessional education; changing practice through collaboration - has run from January 2006 through to December 2007 and a full evaluative report is due to be submitted to the HEA in January 2008 (HSC 2006). As the project team are still preparing this report it is not possible to present findings from the data within this paper, but some of the issues raised in student feedback during the evaluation concerning the Simulated Community can be shared. Some student feedback suggested there was a thirst for more interactive experiences and pointed to the need to enhance the profiles and structure of the community for future years. This particularly concerned the framework around the characters used in the case studies - their neighbours and friends and supporting network that weren't currently in evidence. However, students had enjoyed the uniqueness of the problem-based learning triggers used in the community as opposed to other methods experienced during the curricula year and also the element of time shifting from week to week. Feedback also suggested that many academics had not really engaged with the episodic nature of the community. Some characters did not have any development beyond the original scene-setting scenario, which in some cases resulted in students printing off the one-page profile to be discussed elsewhere. Where episodic methods were used there was more positive feedback such as occupational therapy and physiotherapy students following the case of someone progressing from a knee operation that included part of the rehabilitation process. The key point highlighted was the need to make academics more aware of the narrative possibilities available to them and

how these could be used within the realms of a simulated community. This focuses on the need to develop academic thinking toward that of a storyteller or scriptwriter, creating within them an awareness of how they could engage students through the possibilities of interactive narration. It is hoped some of the findings issued in the final report to the HEA will continue to inform the development and evaluation of Virtual Europe, as they will the Wessex Bay Community. The Virtual Europe project team are already monitoring and working on evaluating the user-friendliness of the current prototype system and making ongoing amendments based on feedback supplied from users. An evaluation of how effective Virtual Europe is will also be completed with the intention of disseminating findings at the 2009 Cohehre Conference. After the presentation of the evaluation, it is anticipated the project team will meet to decide on the future development and direction of Virtual Europe.

6. The challenges

Based on developmental experience with the Wessex Bay Community, aiming to develop the first iteration within a set time frame presented a series of challenges and problems. Creating the virtual aspect in an effective and engaging design, developing case scenarios with health and social care practitioners, piloting the community with users, evaluating the experiences and refining the system ready for curricular implementation and dissemination to the academic community was an immensely difficult process which is still ongoing.

Working with European partners has identified a much larger range of technical requirements that have been requested for inclusion since the original prototype of Virtual Europe was presented. These have included:

- Ability to create blank cases and upload a variety of differing file formats

- Refining the look and feel of the system

- Creating new towns and country maps for each interested party

- Refining the guest access and security mechanisms to cope with partner requirements.

Funding for this project has been identified as a problem, as the initial funding from Cohehre only covers limited travel costs for partners in the first two years with a little extra money available in the third. This has meant some limitations on what can be achieved using the model of full economic costing in terms of the design and development of the system and the creation and use of cases within the curriculum.

The perceived problems of engaging academics in thinking about new learning methods have been highlighted from HEA project feedback. This challenge becomes even greater when trying to present similar ideas and opportunities to a European audience. The wider cultural differences in teaching styles and pedagogic approaches means there is an even greater variation in the potential possibilities and problems of engaging academics in using the system effectively. Viewing the initial cases created for Virtual Europe has already highlighted several differences, with the Belgium burns case offering a much more in-depth approach compared to the UK and Dutch equivalents. There is an almost blank slate in terms of what systems like Virtual Europe can provide to a user and sometimes it is difficult to visualise how these can and should be implemented. This also raises the question of whether there should be a standardised approach on how case studies are used within the system or whether each participant should be free to input and use their cases as they wish. Similar decisions but conceptually more simple to address are those regarding the standardisation of file formats used within the system.

Finally, intellectual property issues still need to be finalised and important decisions need to be made regarding how new funding aligns with the initial Cohehre funding. At present, case studies provided are copyright of the individual universities that supply them and should they wish to remove their cases at any time they may do so. The technical aspects of the project (the programme code, images and associated materials) are copyrighted to HSC at Bournemouth University. The problematical issue of what would happen if various partners wish to withdraw from the project at any point still needs to be resolved. There is also a question around whether the system should exist in the public domain or whether it should sit behind a password protected area for use only by the Cohehre membership. Medskills is a Leonardo da Vinci project whose goal is to create a unique web realistic training and learning environment of evidence-based medical skills. The project spans 6 different countries and covers topics that include medical fundamentals, respiratory difficulties, chest pain, shock, minor surgery, burns and urgent delivery. The modules comprise high quality images, video and audio material, self-testing and a dynamic patient simulator and will be freely available to any Internet user once the project has been completed. The project targets education, but also has a social impact as it opens a dialog between European Countries to discuss the needs for a uniform

medical skills knowledge base (Medskills 2007). These questions concerning intellectual property and use are similar to those being asked of Second Life creators Linden Labs by educators wanting an open source rather than proprietary virtual world. This has recently resulted in some Second Life source code being made publicly available (Linden Labs 2007).

7. Conclusion

The Virtual Europe project has the goal of helping Cohehre to establish itself as a European learning organisation and community by allowing members to pursue issues of common interest and practice; relying on one another for information and learning; seeing themselves as part of a larger whole; supporting the sharing of divergent ideas; engaging in critical reflection; engaging in constructive change and creating a spirit of co-operation. Halfway through the project lifecycle, how successful has the development been?

We are making good progress on a number of issues surrounding the project with a sound technical prototype system that currently holds the cases for three partner institutes with invitations having been sent to other interested partners in June 2007. The second year is certainly the most important of the three in terms of being able to move the project forward so that we are hosting a larger number of cases and that these are being adapted and developed into useful and meaningful educational experiences that can be used successfully within each institution curriculum during the third year of the project.

Running a project within one organisation is a huge challenge in terms of trying to ensure that all participants are keeping up with their objectives. Attempting to do this on a European wide basis with the problems and challenges identified in addition to the communicational limitations imposed (an ability to meet in person only twice each year whilst relying on email for the majority of contact) is proving to be very challenging.

However, at this point in the project lifecycle we remain confident that the project is on track and that the potential benefits offered can be brought to fruition even as the virtual worlds and pedagogies that surround the project continue to evolve and mature.

References

Aldhous, P., 2006. *Illness simulators boost medical empathy*. New Scientist, Available from: http://www.newscientist.com/channel/health/mg19025466.400-illness-simulators-boost-medicalempathy.html [Accessed 13 December 2007]

Aquacade, A., 2007. *Interview With the Agoraphobic: Fighting the Fear in Second Life.* Second Life Herald. Available from: http://www.secondlifeherald.com/slh/2007/02/interview_with__1.html [Accessed 13 December 2007]

BBC News, 2007. *Legal battle over 'right to die'.* BBC News Online. Available from: http://news.bbc.co.uk/1/hi/health/6353339.stm [Accessed 13 December 2007]

Biggs, J.B., 1989. Approaches to the enhancement of tertiary teaching, *Higher Education Research and Development,* 8, 7-25.

Biggs, J.B., 2003. *Teaching For Quality Learning At University, 2nd ed,* Open University Press, Buckingham.

De Freitas, S., 2007. *Learning in Immersive Worlds: a review of game based learning.* JISC. Available from: http://www.jisc.ac.uk/eli_outcomes.html [Accessed 13 December 2007]

DIPEx, 2007. *Personal Experiences of Health and Illness.* DIPEx. Available from: http://www.dipex.org [Accessed 13 December 2007]

Dixit, J., 2006. *The war on terror.* Wired. Available from: http://www.wired.com/wired/archive/14.08/warterror.html [Accessed 13 December 2007]

Eduserv, 2007. *Eduserv Research Grants.* Eduserv Foundation. Available from: http://www.eduserv.org.uk/foundation/grants [Accessed 13 December 2007]

ELSPA, 2006. *Unlimited Learning - Computer and video games in the learning landscape.* ELSPA. Available from: http://www.elspa.com/assets/files/u/unlimitedlearningtheroleofcomputerandvideogamesint_344.pdf [Accessed 13 December 2007]

Futurelab, 2004. *Futurelabs Projects – Savannah.* Futurelab. Available from: http://www.futurelab.org.uk/projects/savannah [Accessed 13 December 2007]

Gibbs, G., 1992. *Improving The Quality Of Student Learning,* Technical & Education Services, Bristol.

HSC, 2006. *Wessex Bay Bid Success.* Poole: Bournemouth University. Available from: http://www.bournemouth.ac.uk/ihcs/news0406a.html [Accessed 13 December 2007]

Kamel Boulous, M. N., Hetherington, L. and Wheeler, S., 2007. "Second Life: an overview of the potential of 3-D virtual worlds in medical and health education", *Health Information and Libraries Journal,* 24 (4), 233-245.

Kohler, C., 2007. *Sony Gives PS3 a Second Life.* Wired. Available from: http://www.wired.com/gaming/virtualworlds/news/2007/03/72895 [Accessed 13 December 2007]

Kolb, D.A., 1984. *Experiential learning,* Prentice Hall, London.

Laurillard, D., 2002. *Rethinking university teaching: a framework for the effective use of educational technologies, 2nd ed,* Routledge, London.

Linden Labs, 2007. *Linden Lab To Open Source Second Life Software.* Linden Labs. Available from: http://lindenlab.com/press/releases/01_08_07 [Accessed 13 December 2007]

Linden, H., 15 December 2004. The Nine Souls of Wilde Cunningham. *New World Notes*, Available from: http://secondlife.blogs.com/nwn/2004/12/the_nine_souls_.html [Accessed 13 December 2007]

Linden, H., 9 September 2004. A lever to move the mind. *New World Notes,* Available from: http://secondlife.blogs.com/nwn/2004/09/in_the_minds_ey.html [Accessed 13 December 2007]

Macintyre, B., 2007. *If you go down to the Eversong Woods today.* The Times. Available from: http://technology.timesonline.co.uk/tol/news/tech_and_web/gadgets_and_gaming/article1590479.ece [Accessed 13 December 2007]

Medskills. 2007. *Evidence Based Medical Skills.* Medskills. Available from: http://www.medskills.net [Accessed 13 December 2007]

NMC and Educause, 2007. *The Horizon Report 2007 Edition.* NMC and Educause. Available from: http://www.nmc.org/pdf/2007_Horizon_Report.pdf [Accessed 13 December 2007]

Pulman, A. J., 2006 "Scenes from a Virtual Europe", *Journal of Allied Health,* 35 (4), 240-252.

Rieser, M. and Zapp, A., 2002. *New Screen Media: Cinema/Art/Narrative,* BFI, London.

Schotsmans, P. and Meulenbergs, T., 2002. Editorial: Euthanasia in the Low Countries. *Journal of the European Ethics Network,* 9 (2-3) Available from: http://www.ethical-perspectives.be/page.php?LAN=E&FILE=ep_detail&ID=33&TID=305 [Accessed 13 December 2007]

SEAL, 2007. *Second Environment Advanced Learning.* University of Leicester. Available from: http://www.le.ac.uk/seal/research/research.html [Accessed 13 December 2007]