

**What advantages does the use of a communal 3D
gaming environment offer in facilitating
co-construction of knowledge?**

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Contents

Abstract	Page 3
Chapter One: Introduction	Page 4
Chapter Two: Literature Review	Page 12
Chapter Three: Methodology	Page 21
Chapter Four: Data Analysis	Page 25
Chapter Five: Analysis of software and questionnaire	Page 28
Chapter Six: Conclusion	Page 32
Chapter Seven: Recommendations	Page 33
References	Page 34
Appendix 1: Screenshots	Page 36
Appendix2: Student task sheets	Page 38
Acknowledgements	Page 46

What advantages does the use of a communal 3D gaming environment offer in facilitating co-construction of knowledge?

ABSTRACT:

The primary goal of the project was to develop a networked 3D simulation space as a teaching and learning tool for contemporary learners. Furthermore I particularly wanted a tool for teaching Social Studies in an Aotearoa New Zealand learning context. The huge amount of unique cultural experiences and stories that our children have are not in my view adequately published and discussed using modern learning media. Using a kaupapa of a 3D gaming space under the SOLO taxonomy my methodology has been to examine whether a targeted 3D space can enhance student learning by encouraging the co-construction of knowledge. During my testing of this process I found high levels of student engagement whilst uploading their personal stories and school experiences and evidence of its potential usefulness. Overall this type of tool could offer huge advantages in facilitating the co-construction of knowledge for learners within our evolving education system.

CHAPTER ONE

INTRODUCTION:

My Situation:

I have been teaching History and Social Studies for 10 years, including 6 years at Aranui High School, 1 year at Hendon (London) and 3 years at Hillmorton High School. I have also been involved in the production of 3D interactive educational software for the New Zealand and international markets, including a bi-lingual 3D virtual Marae for social studies classes. My passion is the teaching and learning of Aotearoa New Zealand history and culture, and the possibilities of using 3D technologies to facilitate this.

What I want to find out and why:

In my experience students have better learning outcomes when they are engaged in the learning process and feel that they are co-constructing parts of their knowledge base. To facilitate this I have used both 3D simulations and Internet-based research and presentation by students. As a senior teacher I feel it is important in many situations to stand back and allow students to construct their own learning experience in the social science learning context. I also feel that the use of contemporary ICT technologies can aid the construction process as a result through increased participation within the learning process by students who in their out of school life enjoy using self publishing spaces like “BeBo” and “Youtube”.

My teaching experience has also included teaching social studies to whanau based bi-lingual classes. Many of my students enjoy a rich multi-modal digital experience in their everyday lives that is often not replicated in their normal

school learning environments. Also many of my students are ardent 3D gamers and display a high level of sophistication in their knowledge and understanding of virtual worlds and simulations, like “World of Warcraft”. Educational researchers like Richard Van Eck and James Gee have long been advocating for the use of digital game based learning (DGBL) in classrooms in support of higher learning processes and to facilitate engagement .¹It is my intention to use elements of 3D gaming, namely an interactive 3D environment, as a tool or medium to facilitate co-construction in learning.

Essentially I would like to find out whether or not a 3D networked student gaming environment offers any advantages in the co-construction of group knowledge.

I wish to do this not only to facilitate the communal publishing of my Māori students' stories and experiences, but to also allow the emerging of new ones and thus the co-construction of new knowledge. This will involve a 3D simulation space that is networked and allows students to publish their own cultural and whānau experiences. Students can then move around inside the simulation to view others work, have internal simulation conversations and post individual and group comments.

¹ Eck, V, (2006) Digital game-Based Learning: It's not just the digital natives who are restless. Gee, J, P, (2005). What would a State of the Art Instructional Video Game look like?

Research Question

My guiding research question is: “What advantages does the use of a communal 3D gaming environment offer in facilitating co-construction of knowledge?”

In this context co-construction to me means learning via membership of a specific learning community that collaborates, shares, and increases its knowledge base through social communication. I agree with Hoadley and Pea’s view of co-construction, “new knowledge needs to be constructed based on prior knowledge”.²

Why this is important:

I believe this is important because students learn best when they reflect on prior experiences and collaborate, communicate and create new understandings together. A communal 3D publishing space could be an effective tool in assisting student co-construction of new student knowledge about Kiwi and Māori cultural experiences within the Social Sciences and beyond. The reasons for this include ease of publication, the ability to select and view many diverse experiences and the involvement of a contemporary youth communication medium. Furthermore shared and increased knowledge of these indigenous cultural experiences is beneficial in increasing inter- Iwi and inter -community education and understanding. In my view it is the act of facilitating learning conversations that will enable this to happen. Early researchers like Vygotsky looked at the social factors in cognition; and contemporaries like Hoadley and Pea state that learning is a social process,

² Hoadley, C, M, and, Pea, R, D, (2001) Finding the ties that bind: Tools in support of a knowledge-building community

“The act of communication transforms all the parties involved”.³

Context:

The project involved working with a group of year 10 Whanau class students in their social studies class environment. This group of students has a very rich and diverse range of experiences, with many different Iwi and hāpu affiliations. The range of whakapapa (ancestry links) includes both that of the Tangata Whenua, Kai Tahu, and rōhe (regions) as diverse as Ngati Porou and Nga Puhi. Traditional classroom teaching based on a transmission model has struggled to promote the uniqueness and depth of this huge range of students' experience let alone enabled it to be shared both within a classroom and outside of it. To enhance these already diverse student backgrounds some students from the local Kura Kaupapa added some of their school and cultural experiences and personal mihi (ancestry and personal information).

The medium used to publish then allow the group to experience these stories is a multiplayer gaming engine called Torque. This software is commercial quality and can be adapted into Xbox games. The software can be networked to allow up to around 80 participants on at the same time and the net effect is to have a communal area where people can move around at the same time. In some ways this is similar to virtual worlds like Second Life (although not on the same vast scale). Second Life is called a MMOG (Massively Multiplayer Online Game) and allows huge freedom of movement and participation. Currently it has over 20 million members, many of them adults, and essentially is based around individual avatars (virtual representations – mostly

³ Vygotsky, Early twentieth Century Russian academic who studied the relationship between language and thinking, Hoadley and Pea, Finding the ties that bind: Tools in support of a knowledge-building community, p3

human) of the computer user.⁴ These individual avatars can roam around almost unlimited landscapes and through the use of grid coordinates can meet up in areas such as edu-island (for teachers around the globe) or the New Zealand Information Island.

In this context I have attempted to create an environment firstly to publish student experiences and stories and secondly to allow a group of students to go into this environment at the same time. Also while inside the environment students can communicate to each other in real-time (via text) and also post their own comments on what they see and experience inside the simulation. It is this “in game” communication by the students that can encourage the learning conversations required for co-construction of new understanding and knowledge.

Definitions of key concepts:

Whānau based bi-lingual class:

Te Kura Tuarua O Horomaka (Hillmorton High School) runs Whanau home room style classes in years 9 and 10 to foster taha Māori learning.

Co-construction:

Based on the ideas of Vygotsky, the concept of co-construction centres on the principles of knowledge being shared and enhanced by individuals in a group setting. Hoadley and Pea suggest that learning conversations are implicit in this process. During learning conversations knowledge is discussed, individually processed and then reassimilated to create new levels of understanding and potentially new knowledge.

⁴ Newsweek Magazine (2007), July 30 2007, p36

Virtual worlds:

For the uninitiated these are 3D spaces that exist in cyberspace and that people can access via a computer. In the past these have commonly been individual spaces (like FPS - First Person Shooter video games but increasingly are becoming networked collaborative spaces. It is these collaborative spaces, which can hold tens to tens of thousands of individuals at the same time, that are the focus of this research.

Communal 3D gaming environments:

Communal networked spaces have the potential to enable co-construction of learning and mass real-time communication on a global level. Common environments are commercial MMOG's where adults and teenagers gather for gaming and social experiences. Interestingly the idea of a lone male teenage gamer hidden away in a dark room is incorrect. Girls, adults and the elderly are increasingly using these mass 3D networked environments as communication, social and gameplaying tools. As mentioned above, I am involved in educator based professional networking environment called Edu-Island in Second Life. This space allows professionals from around the world meet and discuss issues like 3D gaming in education and the pedagogical use of ICT tools generally. Examples of communal environments include Second Life and World of Warcraft. However there are countless more with many having tens of millions of members; and many being culturally exclusive -for example Korean MMOG'S, which are Korean speaking only.

3D simulations:

One unanswered question that is relevant to this project is whether or not there is a difference between games and simulations. In this context, a pilot training via a flight simulator is different from a person using an entertainment based flying game where planes are shot down in virtual combat. Aside from the obvious preference of flying with someone based on the first example in the real world the point where game play merges with real world simulation is sometimes unclear. Commentators like Prensky argue that gaming and role play have a place in education; but in a general sense “edu-tainment” has often failed to merge commercial games into education.⁵ Clearly games need to strike a balance between being fun, and thus engaging, and performing some educational outcome e.g like a virtual physics experiment or a deeper understanding of an issue or concept. In this context the use of a networked 3D environment adds another layer upon this issue by attempting to allow communication to occur, and hence co-construction of knowledge,.

Avatars:

An avatar is a virtual representation (usually human – sometimes an animal or an inanimate object) of an individual computer user.⁶ These individual avatars can walk, fly or teleport around almost unlimited landscapes (in a MMOG - Massively Multiplayer Online Game). Also it is important to note that each avatar seen in an environment is in fact an individual behind a screen. Often games will have the avatar's name above its head for easy recognition; or a group or tribal descriptor. In environments like Second Life people can spend

⁵ Mark Prensky (2004) NZ eFest 2004

⁶ Newsweek Magazine p36

a lot of time and money personalising their avatars and a real world millionaire, Anshe Chung, made her fortune selling virtual clothing to people to use in the simulation.⁷

⁷ Newsweek Magazine p36

CHAPTER TWO

Literature Review

3D gaming/simulations and learning

Gee (video games and learning)

Gee argues that games reinforce engagement by requiring the participant to adhere to prescribed values and norms of their chosen community. This can only be done by players increasing their knowledge and experience to a high level. Gee also states that good games, when well designed, “get themselves learned and learned well”.⁸

Oblinger (Sims, games, learning)

Diana Oblinger comments that games are something many adult educators discuss with discomfort. She states that “Games can seem un-educationalFor many educators, the term “game” conjures up a mental image of playing cards or a game like Jeopardy.”⁹ Oblinger also says that many teachers are neither game players nor developers; yet digital games can play a rich part in the educational experience. She goes further saying that games are now part of modern culture, worth \$29 billion in the U.S alone (more than Hollywood movies).¹⁰ Oblinger also states that DGBL (Digital Game Based Learning) is now an accepted pedagogy and that teaching staff members require training in its use. She points out that in the U.S only 55% of gamers are male; and cautions about gaming's appropriateness – not all games are effective.¹¹ Oblinger further comments on the immersive and engaging nature

⁸ Gee, abstract

⁹ Oblinger, D. (2006) Simulations, Games and Learning, Educause Pre-symposium Paper, p1

¹⁰ Oblinger p2

¹¹ Oblinger p2

of games that allow context memorisation, planning and inter-individual organisation to occur.

Van Eck (Digital Game Based Learning - DGBL)

Van Eck is a long time advocate of DGBL but cautions that contemporary participants often get caught up in the medium and forget the message.¹² By this he means educational gaming per se is not the educational Holy Grail but that gaming that is well planned and executed and supported can be a useful educational tool. Van Eck argues that educators and researchers need to collaborate to provide effective DGBL for students via curriculum alignment, design and evaluation. He further recommends that some COTS (commercial off the shelf games) could be used in the classroom now as a cost effective solution but warns of the pitfalls, such as curriculum appropriateness. Problems include COTS not being all equally effective and the limited range of gaming and game learning pedagogies used by strictly commercial developers.¹³

Prensky, Marc (Gaming Education)

Prensky asserts that recent studies have shown that video games have a positive effect on enhancing student's visual selective attention.¹⁴ Another advocate of DGBL, Prensky argues that video games are a great way to engage learners in what he calls "real learning".

¹² Van Eck, R. (2006). Digital Game-Based Learning: It's Not Just the Digital Natives Who Are Restless, Educause Review, p15

¹³ Eck p7

¹⁴ Prensky, Abstract

Horizon Report (2006)

The Horizon Report (2006) separates simulations from games.¹⁵ In terms of simulations the report likens them to something that “mimics a real-world process”.¹⁶ In this context medical simulations and flight trainers are obviously designed to fulfill a single one educational purpose.

3D social networking environments

Newsweek (SL)

An article in Newsweek (July 2007) about Second Life gives novices an insight into a new global phenomenon centred on a 3D social networking space used by millions of people.¹⁷ Second Life is emerging as a huge new medium for social interactions between teenagers and adults alike.

Newsweek points out that many disabled people now use Second Life as a virtual living area where they can communicate and move freely, unconstrained from their real world physical limitations.¹⁸ At the time of writing Second Life has over twenty million members and about 90% of the content has been created by the users themselves.¹⁹ This content includes huge areas of social networking space and user created objects and buildings. These vary from virtual embassies, palaces, virtual campuses to nightclubs and member islands. To communicate, users can either text each other or use VOIP (voice over internet protocol), so in effect individual avatars can talk to one another or to a whole group. Aside from commercial entities, like Toyota who use this vast medium as a marketing space, with virtual shops and

¹⁵ Horizon Report p17

¹⁶ Ibid

¹⁷ Newsweek p36

¹⁸ Ibid

¹⁹ Newsweek p39

showrooms, adult educators are using it as a professional networking space. Educators can have “in environment” blogs, like blog walls besides buildings, as well as virtual meetings and seminars. The potential for students' use is also apparent for similar activities as well as virtual field trips and specialist meetings and collaboration activities. The only caveat with this potentially useful medium is the propagation of a wide array of adult material and the potentially unrestricted access of “colourful characters” in the virtual environment. However these risks can potentially be mitigated by allowing member-only access to certain places inside the vast virtual environment.

Gavin (Tech Lab)

Gavin also comments on Second Life and says further that the original virtual world users are now in their early twenties and are demanding much more consumer variety in real life, mirroring that of user unique virtual experiences.

²⁰ However he also points to virtual world limitations, saying that they have not met the need for asynchronous communication that programs like Facebook, Bebo and My Space provide. ²¹ But Gavin does concede that these technologies will merge in the future, with improved interfaces and personalised applications built in to massive multiplayer virtual worlds.

Furthermore Gavin states, “Virtual worlds will also become integrated with real environments. Buildings or public spaces may offer virtual world counterparts”. ²² In this scenario students could walk out onto a sports field, put on VR (virtual reality) glasses and take a virtual tour of a Wharenui or Marae. They could then walk back to their own school Wharenui and discuss similarities and differences between the two.

²⁰ Gavin, L. (2007). Social Networking Sites, The Tech Lab, www.bbc.co.uk p1

²¹ Ibid

²² Ibid

Oblinger (Sims, games, learning)

Oblinger points out that video games are often social environments which have a social and cultural impact.²³ Furthermore she says multiplayer environments enable 'learners to develop epistemic frames and social networks'²⁴ Oblinger goes on to say that "Utilizing games or multi-user immersive virtual environments in education will require "unlearning" many unconscious beliefs, assumptions, and values about teaching and learning as well as the structure of education".²⁵

Horizon Report (2006)

In a projected implementation timeframe of 2 – 3 years the report comments on virtual environments, specifically Second Life and World of Warcraft, and mentions the medium's potential for engagement.²⁶ The report also comments on the creational aspects of virtual worlds and the ability to study a vast area of specialist topics. The report also discusses the appealing aspects to users of co-operative play and the recent undertaking of researchers to examine MMORPG's (massively multiplayer online role-playing games) to study the interactions that take place.²⁷ Finally the report comments on alternative reality games where game play and real life are intertwined within game play and real world activities.

²³ Oblinger p2

²⁴ Oblinger p5

²⁵ Ibid

²⁶ Horizon p18

²⁷ Ibid

Māori Student Culture

Gibbs (Connect Cultures)

Gibbs' action research was a study of how project based learning using digital technologies enabled bilingual students to share aspects of their lives with mainstream teachers and classmates.²⁸ Part of her focus was on engagement; and she found that an important factor was her own personal pedagogical practices, understandings and relationships with the students. Gibbs also alludes to the benefits of the technology alone but also states “I also found it was important to work at the point where tikanga comfortably meets constructivist pedagogy”.²⁹ In essence the technology cannot work in isolation but obviously needs input from all stakeholders, whanau and appropriate “cultural experts”. In this vein Gibbs talks about teaching in a Māori-centred context versus a context based on Pakeha norms, cultural perspectives and ideologies.

Friedmann (world is flat) (2006)

Friedmann's brief mention of culture in his book “The world is flat” alludes to the potential power minority indigenous cultures can potentially have by way of technology. In essence, Friedmann says uploading equals a “globalisation of the local” and in fact can be anti-homogenizing in regards to culture³⁰ He states that communities need to get the best out of the platform rather than fear it. In this regard small and disperse groups of say a Kai Tahu hāpu could not only communicate within their Southern rōhe, and internationally, but they

²⁸ Gibbs, G. (2007) Digital Bridges – Connecting Cultures , Computers in New Zealand Schools, April 2007, p23

²⁹ ibid

³⁰ Friedman, T. (2006) The World is Flat, Penguin Books, London, p505

also could publish their stories and culture to a global audience. A further example could include the Kai Tahu Te Reo Māori dialect and its application for speakers as well as the publication of learning examples and materials. Friedmann suggests niche publications and communications could in fact empower small communities rather than see them be swamped by globalisation.

Bishop, R. (Te Kotahitanga)

Bishop sees Kaupapa Māori as an educational “proactive theory” in its application in schools.³¹ Bishop also provides an effective teaching profile list to aid educators in teaching in a more appropriate Māori learner centered ways.³² One aspect of this guide is Wānanga, or “as being known as Māori centers of learning wananga as a learning forum involves a rich and dynamic sharing of knowledge”.³³ By stating this and the fact that Maori students obviously need to be engaged as Māori, Bishop’s guide allows for the use of any tool that allows student voice and communication in a Māori cultural and experiential context.

Constructivism

Leinonen et al. (Supporting Learning Communities in Education)

Leinonen et al talk about constructivism and communication in the learning process. They state that “In the psychology of education the theory of social constructivism asserts that knowledge can not be transmitted from teacher to

³¹Bishop , R. (2007) Te Kotahitanga: Kaupapa Māori Research in Action

Paper presented to NIEC 4th Indigenous Conference, Newcastle Australia 27th November 2007, p1

³² Bishop p22

³³ Ibid

students”.³⁴ They say everyone’s learning is constructed upon a prior base, “Knowledge can only be obtained only if the learners are actively constructing their own understanding of the knowledge under consideration of the community”.³⁵ They go on to argue that the theory of social constructivism is based around the learning group rather than being passive or teacher directed like the transmission model.

Biggs and Collis (SOLO Taxonomy)

– The Structure of Observed Learning Outcomes (SOLO), developed by Biggs and Collis, is a cognitive processing taxonomy. Used in asTTle to categorise student performance, it is centred on four levels.

The first one is Unistructural or simple connections like the question “who painted the art work *Guernica*?”

Secondly there is Multistructural or where a number of connections are made e.g. “outline two principals Picasso used in his work, *Guernica*.”

Thirdly there is Relational or significance parts to the whole types of questions e.g. “relate the theme of *Guernica* to a current event.”

Fourthly there are Extended abstract or connection questions beyond subject matter e.g. “what do you consider Picasso was saying through his painting of *Guernica*?”³⁶

These levels of questions seek to progressively gain further connections and understanding by the participants.

Hoadley and Pea (Finding ties that bind)

³⁴ Leinonen, T, et al, (2000) Supporting Learning Communities in Education , p2

³⁵ Ibid

³⁶ Biggs and Collis p4

Hoadley and Pea discuss the development of knowledge building or learning communities. The basis of their study is that rather than communication tools per se we need knowledge networking tools that support individual information needs relevant to that community.³⁷ They add that building knowledge communities are a complex task and that many areas of inquiry would simply not exist without current technology. Also they say that ultimately these communities need to meet the needs of individuals and their communities and to be implemented with community support.

Edelson et al (Constructivism)

Edelson et al talk specifically about constructivist learning environments using technology.³⁸ They also add a “sociocultural component” to their constructivist approach. This involves collaboration and communication tools together with expert guidance and multilearner collaboration. They also discuss the importance of learning conversations in the processes discussed.

Vygotsky (Co-construction of learning)

Vygotsky basic tenet was “Thinking is mediated by speaking.” He placed great emphasis on learning conversations as a medium for constructing learning. Under this principle learners co-construct their learning by sharing experiences and ideas. Thus communication is critically important in the overall learning process. One of his famous quotes was “All higher (mental) functions originate as actual relations between human individuals”.³⁹

³⁷ Hoadley and Pea p1

³⁸ Edelson et al p 1

³⁹ Leinonen p2

CHAPTER THREE

Methodology: Case Study

The case study involved students collating their own Social Science related cultural experiences digitally (MPEG video/photos and word documents). Students then posted these experiences in a small 3D environment for viewing by the whole class group. In this 3D space students and teachers were able to walk around together and view each other's postings. Also while in the 3D space individuals were able to communicate live, via typed messages, and post comments on what they experienced in the 3D environment. The purpose of this 3D environment is to enable publishing and communication in a similar fashion to much larger spaces like Second Life - a massive multiplayer on-line game. The educational goal is to try and create a 3D blog type space to aid social communication and thus facilitate an increased awareness of different cultural practices and shared knowledge.

Students were selected from a year 10 whānau class group. This group has a range of cultural and Te Reo Māori experience, ranging from Kohanga Reo involvement to lifelong main stream schooling. These students have a compulsory social studies class as well as requirements to attend Kapa Haka and submit oral speeches for regional Manu Korero speech competitions. It was these cultural experiences that the students published in the 3D environment.

Method context

The schools chosen were Te Kura Tuarua O Horomaka (Hillmorton High School) and a small number of students from Te Kura Kaupapa O Whakapumau. Horomaka is a mid-decile school (roll 800, with approx 112 Māori students). Horomaka is interesting in that it has a “slice of New Zealand” in regards to demographic representation -i.e. it mirrors the national average statistics for Pakeha, Māori and Pacific Island students. Te Kura Kaupapa Whakapumau is a Māori Kaupapa based school in Otautahi (Christchurch) and draws in students from across the city and country in terms of Iwi and Hapu representation. Both schools exist in a general social environment where some people believe that there is little Māori culture or demographic presence in the region. However these opinions ignore the vibrant presence of the Tangata Whenua, Kai Tahu, not only economically and socially but also in terms of the rich heritage and non-institutional learning that goes on around the Waitaha rōhe (Canterbury region). This is seen in the diverse Marae and Wharenuī around Canterbury and Banks Peninsula where rangitahi (young people) have whakapapa and whānau ties and home Marae connections. I have been involved with students from Horomaka on a range of “Living off the Land” and cultural workshops presented on various Marae from Taumutu (Lake Waihora) to Koukourarata (Pot Levy). It was the learning interactions between staff, senior whanau members and students that led me to seek new avenues to express the rich cultural heritage and experiences that I saw on display. Furthermore, in the schools involved in this study there exists is a very diverse and unique range of North Island Iwi and Hāpu representations. These include students from Ngati Porou, Tai Tokerau,

Taranaki and the Ngati Maniapoto to just name a few.

The key point is that in Canterbury Māori whānau (Both South Island Tangata Whenua and North Island alike), culture and language are very strong and vibrant and will always remain so.

In practice the original methodology was attempted and modified on several occasions, with several members of the original year ten group leaving the Whānau based learning class. Students were very keen to present their stories and set about their mahi (work) with great enthusiasm.

Compiling process

Learners were usually very open when asked to compile their stories. All students enjoyed conveying their personal mihi digitally and were keen to present the achievements of their school. Students also displayed great enthusiasm in seeing their photos, stories and school experiences in a 3D environment.

Method:

1. Initially students were briefed on the project; and participants were asked individually about the different types of Māori cultural experiences they were aware of (some video interviews, mainly written form).
2. Students gathered information on their own experiences that were to be published (digital video of them giving their mihi and describing their own whanau cultural experience, Word document summarising these

experiences).

3. Students published their experiences in the 3D environment and, as a class, went into the environment to view each others work and place feedback. Evidence of social conversations about cultural practice were looked for.

4. Students were asked individually about the different types of Māori cultural experiences they were aware of (some video interviews and written form), after the shared class 3D experience. In this phase I was looking for evidence of any new knowledge gained by individual students.

CHAPTER FOUR

Data Analysis:

Learners

Questionnaire – modification

During the testing it became apparent that the questionnaire was inadequate as it did not reflect the SOLO taxonomy process. In particular it did not accurately reflect the progressive stages of the taxonomy and its need to associate connections. In response to this I changed the questionnaire and made the questions much more progressive in their attempt to stimulate outside connections and experience.

Testing

The testing process firstly involved members of the year ten whanau class each of whom had a laptop and a worksheet. Moving around the simulation the students to answer questions which reflected the four stages of the SOLO taxonomy.

Firstly unistructural, or simple and obvious connection questions were asked like “what is the name of the centre pole inside the wharenuui?” and “Give one rule about something you should not do in a wharenuui”.⁴⁰ All students coped well with this low level task.

Secondly, students were asked multistructural questions, where a number of connections are made but the meta-connections between them are missed, as is their significance for the whole. These types of questions included “Name the 2 types of schooling for Māori students”, and “What geographical

⁴⁰ Appendices p37

feature is first listed in all mihi?” Again using simple pieces of information inside the virtual wananga the students answered these types of question very quickly.

Thirdly relational level questions, where the student is now able to appreciate the significance of the parts in relation to the whole, were asked like “The term Polynesian links Māori with Pacifika peoples – what other terms are used to link other groups?”, and “What food rules do other cultures have?”.⁴¹

Fourthly extended abstract level questions were asked, where the student makes connections not only within the given subject area, but also beyond it. Examples included “Why do you think cultures have rules for food and the body?” and “Why do you think it is important for people to give their geographical origins (maunga) when giving their mihi?”

Various answers were given to these questions although students found it increasingly more difficult to express themselves as the questions got progressively more complex. However students did come up with some surprising connections. For example, one girl related experiences from Hawaiian culture that she had experienced. Furthermore students started to express views on tikanga like why there were rules around hygiene in the Marae, or, as they put it, rules about “bums” .

Blog responses

Students really enjoyed discussion within the simulation using the blog medium. This was interesting in itself as was their preferred way of communication – text language. Students had to go to the blog wall in the

⁴¹ Ibid

simulation and leave short messages – commenting on what they had seen and the questions answered via the worksheet. One of the more interesting comments was from a girl who after reading a blog compared the different Marae social rules with that of Samoan society. These comments included “Wot u gt 4 rulz 4 otha cltres” and “Sa styles n tht lke no stnd n fd”. What this showed was the communication – “What did you get for comparing rules from other cultures” and the response “It is similar to rules in Samoan society where it is considered to be rude to stand and eat”. This communication in the game via text communication was very interesting to observe and well liked by the students. Blog entries also included comments on school life and Whānau class activities concerning Manu Korero and trips out of school. In summary the blog element was a successful communication medium for the students .

Comments

In conclusion the students enjoyed the process even though they found it difficult at times to articulate their responses top the extended abstract questions. The in-simulation text communication tools were also very popular, although, being written in text language, they were at time a little hard for adults to read . Students also enjoyed seeing their experiences and personal mihi displayed within the simulation. Many commented that they would like outsiders to see their work while some expressed “shame” or embarrassment that others would see it. The mixed response highlights the potential pitfalls of this type of technology – namely the potential lack of individual privacy for students. Methods could be developed to keep identity separate from

simulation participation – like make believe names, but this would have to be further thought through.

Teachers

Compiling process

For those involved with the process, the compiling of the student experiences and stories was a relatively easy task. With simple guidelines the students were engaged and active in articulating and recording their personal mihi and school experiences with minimal teacher input. The process took relatively little class time to complete. Once the information was put into the simulation the students helped refine the design, and again enjoyed this process.

Problems – issues

Issues did arise in the collection of data where students either moved from the class or moved changed schools. In this respect it was difficult to maintain a core of students to complete the research. Other issues included a delay in inputting the stories into the simulation due to technical problems and sometimes the issue of access to the students due to trips and regular school commitments such as class tests and activities

Student use of simulation

The testing of the simulation by the students was carried out using regular school equipment although older equipment would be of little use due to the demands of graphics-rich 3D simulation software. Quite simply this type of simulation will not run on older machines due to their low specification of their

graphics cards. Data was collected by interviews and observations as well as from simulation transcripts and the recording of student's blogs.

Blog responses - results

The blog comments were fascinating for teachers, particularly the comments "Wot u gt 4 rulz 4 otha cltres" and "Sa styles n tht lke no stnd n fd". Again the communication said – "What did you get for comparing rules from other cultures" and the response "It is similar to rules in Samoan society where it is considered to be rude to stand and eat". These are fascinating in that it is evidence of higher order thinking skills as well as showing a fluent ease of communication amongst the students. Aside from the occasional problem of deciphering the text-style communication it was a medium the students felt very comfortable with. Furthermore the students enjoyed the ability to comment "in simulation" on the material. The potential also exists for teachers to join in during the simulation experience. This use in the future could be achieved using both intra- and extra-net. This also has the advantage of being a good way of getting student reflections to teachers in an unobtrusive manner; and gives more introverted kids a medium to express themselves.

Comments – use of multiplayer simulations as learning tools

This medium is potentially useful as a tool facilitated by teachers, although both technical issues and professional development would have to be addressed before mainstream use and uptake is achievable. As a specifically Social Science tool it is very exciting in allowing classes, stakeholders and

resident experts to meet in a 3D space, communicate and learn together. In terms of data collection the process is relatively straight forward with the only expected bottlenecks being putting data from students into a simulation by the teachers themselves and the use of the tool in a real world classroom environment. In this regard a lot of work would need to be done in terms of usability and appropriateness for twenty-first century classrooms. Availability of good equipment could also be a potentially limiting issue for some schools, especially those with limited access to broadband. This is likely to be a barrier to its use as an internet communication tool.

CHAPTER FIVE

Analysis of the software and questionnaire

In general terms the questionnaires achieved their purpose. However, the first questionnaire was inadequate because it failed to reflect the structure of the SOLO taxonomy and its supporting questions, of an Aotearoa New Zealand context, in a progressive manner. In this respect the link between the simulation and higher order thinking was both not clear and supported. As a result, the questionnaire was adapted.

The second questionnaire was much better at making the links clear, and successfully reflected student experience and revealed evidence of higher order thinking skills.⁴²In particular questions like “The term Polynesian links Māori with Pacifika peoples – what other terms are used to link other groups?” and “What food rules do other cultures have?” were very useful in stimulating higher order thinking. The new set of questions showed the usefulness not only of the SOLO taxonomy but also its combination with a networked 3D publishing and communication tool. The questionnaire served as a good guide for the students although eventually it would be better to have all instructions inside the simulation, including a virtual teacher/guide and classroom/learning space.

⁴² See appendices

CHAPTER SIX

Conclusion:

In conclusion a communal 3D gaming environment has the potential to offer many advantages in the facilitation of co-constructed knowledge-based learning in Aotearoa. This is particularly the case for teaching Social Studies in an Aotearoa New Zealand learning context and environment. The huge amount of unique cultural experiences and stories that our children and young people have need to be shared by our learning communities. Using a combination of a networked 3D gaming space with the SOLO taxonomy as a learning framework a targeted 3D space could enhance student learning by encouraging the co-construction of knowledge. Furthermore this type of synchronous learning and communication tool could be an ideal outlet for niche learning communities, cultural and unique interest groups. During my testing of this process I did find evidence of this as, well as high levels of student engagement in uploading their personal stories and school experiences. Overall these tools could have a huge positive impact for learners in this country and for their social learning and communication development both nationally and internationally.

CHAPTER SEVEN

Recommendations:

1. Funding:

Funding is required to do further research on this type of medium both in an Aotearoa New Zealand context and as a social development tool. Further research would establish whether or not a networked 3D learning tool could be feasibly put into practice in our unique teaching and learning situations. Funding would also be required not only for adequate technology to enable the use of 3D teaching tools but for professional development to help educators get the confidence they would need to get the most out of the technology and its application.

2. Collaboration:

If these types of tools are to be used in an Aotearoa New Zealand context the link between the technology and whanau, stakeholders and students needs to be very strong. The richness of our shared heritage is a precious thing and the sharing of it must be done in an appropriate manner. In this respect collaboration is crucial as any implementation of this technology must be consultative and well supported by all stakeholders to achieve the desired outcomes of a deeper student learning and shared cultural experience.

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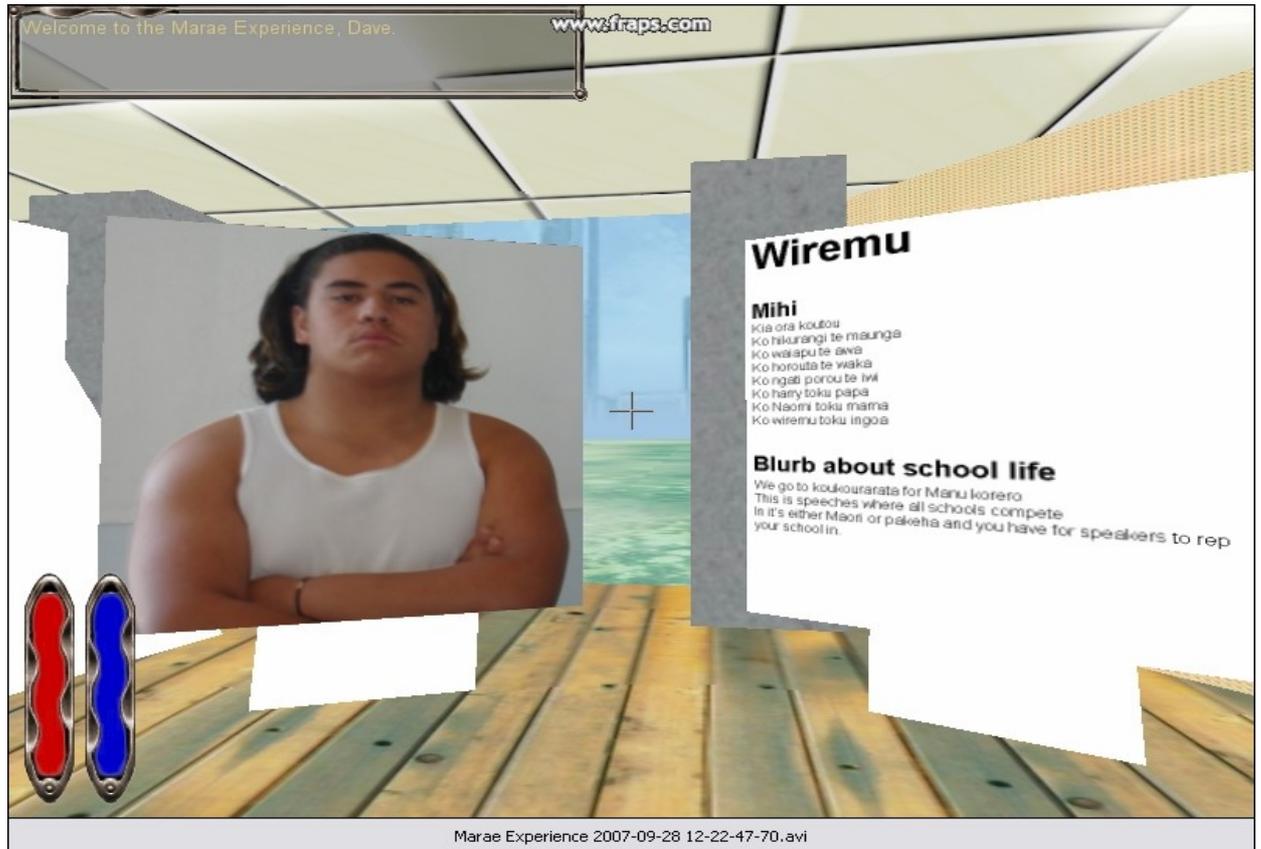
APPENDIX 1 Screenshots

Screenshot 1



A simulation screenshot showing a traditional Whareniui alongside the Wānaka (Wānanga) containing the student experiences and blog areas.

Screenshot 2



A simulation screenshot showing a student mihi display.

APPENDIX 2 Student Tasksheets

Wānaka

Student Report

J. Parsons



Tuhia to pūrongo ki konei: Write report notes here.

The Ministry of History has created a new hi-tech marae complex for community learning. Go to the marae and report back on what you find.

Kua waihangatia e te Tari Kōrero Onamata tētahi marae whaihanga hei akoako mā te hāpori. Me haere koe ki taua marae tiro tiro haere ai, ā, i tō wehenga mai ka tuhi kōrero mō ngō, mea i kitea e koe i reira.

Mission 1 - Tūmahi Tahi

Find the gallery and explore the ground floor. Answer the following questions:



10. Why do you think cultures have rules for food and the body?

11. Why do you think it is important for people to give their geographical origins (maunga) when giving their mihi?

12. What do you think Māori educators are trying to teach their students?



Mission 5 - Tūmahi Rima

Go to the 3 blogs and post a quick comment of your thoughts on each.

Kia Ora

Horomaka Whanau – Our Experiences

Name:

1. Please give your mihi

2. Please describe your school life at Horomaka

**3. How would you describe your Kapa Haka group to a stranger?
(What are some of the things you do, traditions etc?)**

4. Do you have a home Marae? Please tell us some of the kawa of that Marae (If not what is some of the Kawa of the Horomaka Wharenui?)

5. Why do you think Marae have Kawa?

**6. What are some of the most important things about your Marae to you?
(Your own or Horomaka's)**

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Jonathan Parsons

Ministry of Education 2007 e-learning Fellow