VWs are not just cars – Literacy journeys in VWs *

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Literacy is vital for success in life. In New Zealand, particularly in South Auckland, there are high literacy needs. Developing the literacy levels of enabling students will allow them a much greater chance of achieving the academic goals to which they aspire. Manukau Institute of Technology has started to use virtual worlds to provide students with engaging and stimulating learning activities. An initial literacy intervention that utilised the virtual world of Second Life with students from a Māori cohort of pre-degree nurses, was designed to promote communication and interactivity, and resulted in improved literacy levels. A second, current project is underway to create a Literacy game in OpenSim. The game will be set in early New Zealand and contain elements of Māori mythology. The delivery shift to a virtual world provides a unique opportunity for educators to promote integrated literacy development geared to the needs of individual learners.

Ma temohiokaora: ma to orakamohio.(Through learning there is life: through life there is learning!)

Introduction

Literacy is vital for success in life. In New Zealand, particularly in South Auckland, there are high literacy needs. Almost one and a quarter million New Zealand adults are not competently literate (ALL (Adult Literacy and Life Skills Survey)) (Satherle & Lawe, 2007). Literacy lies at the heart of transforming lives. Developing the literacy levels of enabling students will allow them a much greater chance of achieving the academic goals to which they aspire. This paper will discuss the feasibility of using Virtual Worlds as tools to address literacy needs.

Literacy can be defined in many ways. The UNESCO definition of literacy, as cited by the Canadian Literacy and Learning Network, is as follows:

> Literacy is the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning to enable an individual to achieve his or her goals, to develop his or her knowledge and potential, and to participate fully in the wider society. (Literacy... It's Essential, 2011, para.3)

Literacy is an integrated process that includes the complete functioning of the individual within his/her society. This more comprehensive and holistic view of literacy is reflected in the definition of literacy used by **Literacy Aotearoa**. This states:

> Literacy is listening, speaking, reading, writing, numeracy and critical thinking, interwoven with the knowledge of social and cultural practices. Literacy empowers

ISBN 1 876346 63 9

> people to contribute to and improve society. (Literacy Aotearoa: Choice Change Freedom, 2011, para.3)

Following participation in the ALL survey in 2007, the New Zealand Government has been instrumental in promoting the development of literacy and numeracy at all levels in the New Zealand educational curriculum. With technological advances proceeding at such a rapid pace, the workplace is getting more and more complicated. Adults who want to participate fully in this workforce need high levels of literacy and numeracy so they will be better able to contribute to developing an increasingly competitive economy. There are also important social benefits for parents, families and communities.'(The National Centre of Literacy and Numeracy for Adults, 2011).

Part of this drive has been the development of the Learning Progressions. These progressions provide a framework for examining literacy levels. The progressions show what adults can do at various points in their learning and provide a guide for knowing the next step or aspect of learning that needs to be achieved. The Literacy Progressions include: Listen and Speak to Communicate, Read with Understanding, and Write to Communicate (The National Centre of Literacy and Numeracy for Adults, 2011). These progressions were used extensively throughout the work reported in this paper.

Literacy needs in South Auckland

Literacy enables people to function as valuable members of society. Within Auckland literacy is seen as a community issue, a workforce and economic issue, a family issue, and a growth and development issue, with 410,000 Aucklanders with low literacy (Sutton & Vester, 2010). In the seven wards of Auckland city, more than 20% of all adults have no qualifications at all (Sutton & Vester, 2010). The situation is also not spread evenly over Auckland City, with all literacy levels lower in South Auckland than in other wards.

Manukau Institute of Technology lies in the heart of South Auckland and has provided tertiary training in the area for more than 40 years. Students are able to choose from approximately 1,500 courses at foundation, certificate, diploma and degree levels.Manukau Institute of Technology's Foundation (bridging or enabling) students range in age from 16 to 60 years, with a recent trend seeing an increase in younger, school leavers entering foundation programmes. This is not surprising considering statistics reported by the now defunct Manukau City Council that more than 800 students leave South Auckland schools each year with few or no qualifications (Quality of Life in New Zealand's Six Largest Cities: A forward from the Mayors, 2009).

Manukau Institute of Technology Foundation students are representative of the ethnic diversity that is characteristic of South Auckland. They represent over 60 countries of origin. Over 40% of all Aucklanders were born overseas and more than 65% of New Zealand's non-English speakers reside in Auckland (Sutton & Vester, 2010). ALL reported that recent migrants and workers with English as a second language are significantly more likely to have low literacy levels. (Satherle & Lawe, 2007).

The virtual world of Second Life was used as part of a literacy intervention with a small group of students at Manukau Institute of Technology. These students were part of a Māori cohort of pre-degree nurses. The intervention was carried out to satisfy the requirements for the National Certificate in Adult Literacy Education, but the aim was

to show the efficacy of using a virtual world for literacy enhancement. If the results from this small group indicated a positive outcome, then a similar study could be conducted with larger groups of students. This could lead to an alternative tool for meeting the high literacy needs of the local community. To fully understand the reasoning behind the choice of a virtual world for literacy development, and for the selection of a Māori group to trial the intervention, these two aspects will be further examined.

Literacy in Virtual Worlds

Virtual Worlds such as Second Life and OpenSim are now used extensively by educators. The new Second Life Education Blog states,

> Hundreds of leading universities and school systems around the world use Second Life as a vibrant part of their educational programs. (Virtual Environments Enable New Models of Learning, 2009, para.1.)

Michael Callaghan (2010), in a press release on IMMERS[ED] 2010: The Second National Workshop on Teaching in Immersive Worlds, claims that, 'already every university in the UK uses (virtual worlds) in some element of teaching and research'(para.3).

On their web page, Linden Laboratories (2011) list hundreds of universities, colleges, schools, and other educational organizations with resources and facilities in Second Life. Avatars in Second Life have access to an inworldSearch tool. Searching for educational groups results in a list of 1,691 groups, 27 of which are literacy groups. These include groups such as RaPAL (Research and Practice in Adult Literacy), The Conch (the Institute of Multimedia Literacy), and the TechnoGrammatologists Collaborative, a group whose stated aim is to maximise communicative potential.

Second Life is now only one of many virtual worlds currently being used by educators and some of these worlds have been specifically designed for educational use. An example of this is the NZVWG (New Zealand Virtual World Grid), an initiative from the University of Otago, the University of Auckland, Wellington Institute of Technology, and the University of Canterbury, a grid set up with an academic focus, for educational research and teaching. Manukau Institute of Technology is already in Second Life, but plan to use the NZVWG and JoKaydiaGrid on OpenSim.

Kay and Fitzgerald (2008) in the Second Life in Education Wiki, have developed a list of categories they believe cover the educational activities in any virtual world. They state:

> The unique qualities of a 3D virtual world can provide opportunities for rich sensory immersive experiences, authentic contexts and activities for experiential learning, simulation and role-play, modelling of complex scenarios, a platform for data visualisation and opportunities for collaboration and co-creation that cannot be easily experienced using other platforms. (para.1.)

Guy Merchant (2009) suggests that literacy itself is changing and that with the infusion of new technology into the curriculum educators are obliged to investigate how technology "changes the texts that are produced and consumed in educational contexts." (p.38). He sees virtual worlds as places where students have a motivation for using literacy in a multiplicity of different and purposeful ways. He cites Barton (2001, p.

100), who states 'nearly all everyday activities in the contemporary world are mediated by literacy and that people act within a textually mediated social world'. He points out that more and more everyday activities involve screen-based literacies and that digital literacy is an integral part of integrated literacy.

Virtual worlds are social worlds where communication is a key element. Basic literacies can be developed by utilising these communication processes. Ryan (2008) summarises the communication features of virtual worlds in the following table:

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 networking 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

Table 1. Summary of communication features of virtual worlds

By using a personalized avatar and interacting in a social space, students are able to participate in learning activities that are engaging and stimulating.Salt, Atkins and Blackall (2008) suggest that the rich 3D environment of a virtual world creates a high interest level and engagement is enhanced by the ability of users to create a unique avatar and interact with other users as they choose. They state that emotional closeness through shared experience and a sense of immediacy arises out of interaction in virtual worlds.

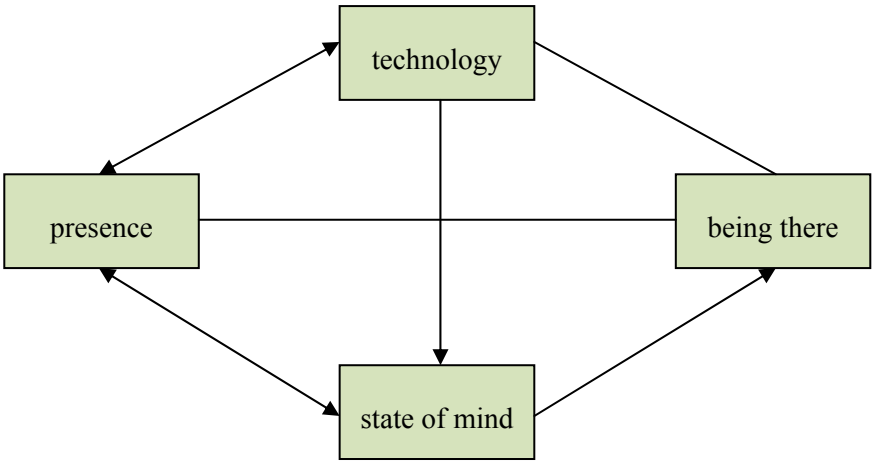

Figure 1. Factors that create the impression of 'being there' ((Merchant, 2009)

Within the virtual world the student feels a sense of presence, of being in a real environment interacting with other avatars. This facilitates engagement and communication and enhances verbal literacy. At the same time, the anonymity of the avatar also serves to facilitate communication. Ryan (2008) states "Virtual worlds can be used as a place where students can express themselves more honestly, talk about sensitive or confidential matters, take social risks, and overcome fears." (p.7)

Māori Literacy and Cultural Literacy

In New Zealand, Māori are over-represented by those who are under-achieving at school. Between 2002 and 2003, 62% of Year 12 Māori pupils gained an NCEA qualification compared to 72% of non-Māori. (Ministry of Education statistics cited by Maxim Institute, 2006).

> Māori are a group of the population most at risk of under-achieving and that Māori are over-represented in the bottom 20 percent of achievers (known as the "tail-end" of achievers). (p.2)

The NgaHaeataMatauranga Annual Report on Māori Education (cited by Maxim Institute, 2006) reported a 20% disparity between the retention rate of 16-17 year old Māori and non-Māori in the education sector.

> The Ministry of Education states that the International Adult Literacy Survey in the mid-1990s showed 69% of Māori adults performed at the two lowest literacy levels, and that these literacy levels are inadequate to "get by" in a developed country. (p.2)

Paulo Freire is one of the most notable names in adult literacy literature, and it is the work of Friere that provides suggestions for improving Māori literacy levels. The model proposed by Freire states that to be a fully rounded human being is to develop a critical awareness of your environment and to maintain creative control over that environment. This complete control is referred to as tinorangatiratanga by Māori, and it is this control that could lead to an improvement in Māori literacy levels.

> Yates (1996, p. 97) summarises the push for tinorangatiratanga as one where, "We strive to regain Māori control and direction of issues and practices that impact on Māori, in a way that gives legitimate and rightful recognition of Māori values, beliefs and aspirations." (Benseman, 1998)

Ladson-Billings (1995) suggested that a culturally relevant pedagogy could be developed to address student achievement and this would involve affirming student's cultural identity while developing cultural perspectives. Eight teachers who were successful with minority students in Ladson-Billings research all consciously created social interactions that focussed on cultural identity, cultural competence, and academic success. They all developed fluid student-teacher relationships, a community of learners and encouraged students to take on the responsibility for each other and work collaboratively. (Manukau Institute of Technology, 2008)

Virtual worlds provide the same environment suggested by Ladson-Billings, where there is more student control and collaboration, and where cultural understanding and cultural literacy can be developed. Diehl and Prins (2008) describe Second Life (SL), a virtual world used by hundreds of educators, and the intercultural literacy development

of avatars as they connect with other participants from all around the globe. SL residents come from more than 100 different countries. In a study conducted by Diehl and Prins (2008) the 29 respondents came from 12 countries and one respondent described SL as a 'wonderful international environment'. (p.110) Another respondent stated, 'I think it could be a wonderful tool for conveying information and spreading ideas about culture, and promoting understanding between various cultures'.

Bers (2008) describes the shift in control in virtual worlds to the learner and Hodge and Collins (2010) outline the importance of establishing a community of learners who can support each other in a social environment. “This social interaction and the relationships that develop between and among students and others create a community of learners.” (p.63). Diehl and Prins (2008) also emphasised community of practice, sharing and collaboration that facilitate learning in virtual worlds. Virtual worlds are described in the same terms used by Ladison-Billings to describe the recommended learning environment for culturally relevant literacy development.

Māori Cohort Literacy Assessment

Students from Manukau Institute of Technology participated in a literacy intervention in Second Life. The aims of the Second Life activities were to:

- Provide authentic experiences in immersive contexts that were culturally relevant to the students
- Utilise the key aspect of communication to foster literacy skill development
- To foster social interactivity while affirming cultural identity
- To encourage more student control and collaboration while developing literacy skills

An assessment for the National Certificate in Adult Literacy Education (Workplace), NCALE course, involved a Portfolio Assessment. The steps were to:

- Complete a Literacy Demands Template for a training or education programme
- Identify strengths and needs of learners by designing initial assessment tasks
- Assess, record, collate and analyse the results
- Develop an integrated literacy skill development programme for the learners with strategies and activities matched to the learner’s identified needs
- Deliver the activities and then assess the learners’ literacy progress.

The group of learners selected for this assessment was a Māori cohort of pre-degree nurses enrolled in the Communication Plus Course with the Foundation Department at Manukau Institute of Technologyunder the auspices of the Māori Health Provider TeKupenga o Hoturoa. It was hoped that literacy needs could be addressed in an integrated way and in a culturally relevant environment. It was hoped that digital literacy and Māori literacy could also be facilitated through the intervention.

The Literacy Progressions were used at all stages of the assessment (The National Centre of Literacy and Numeracy for Adults). A literacy diagnostic was developed and administered. Eight students were identified with low literacy levels and literacy needs profiles were completed on these students. Two specific students from this group became the focus of the assessment:

 Learner A

Learner A was a 40 year old Māori student, who returned to study after a long absence from formal schooling. She was highly motivated to succeed on her career path, but had a less than satisfactory experience in her years of secondary education. She could express herself well orally, but displayed major problems in written expression.

 Learner B

Learner B was of Māori-Samoan descent. She was 21 years old, and left school early as she felt she was unsuited to the secondary school system of learning and teaching. She was a highly motivated student but this motivation was a recent development. She was repeating Communications Plus as the previous semester she had not fully engaged in the programme. She had now made up her mind to pass and move on to mainstream study. She was able to express herself in writing, but with errors in grammar.

The progressions selected as a focus based on the diagnostic were Write to Communicate and Read with Understanding. Figure 2 shows the diagnostic and the course end objectives mapped against the Learning Progressions. Data from a 300 Word Mastery essay test was used to validate conclusions.

The first set of activities was introduced to students as voluntary extension homework tasks.The prepared sheets were self-marking (the answers to Sheet 1 on Sheet 2 etc.). The activities were designed to progress from simple to more challenging. Activities included:using punctuation, selecting correct grammatical structure, using prefixes/suffixes, tense selection, and using correct sentence structure. These homework sheets aimed at addressing Write to Communicate Learner Progressions including understanding purpose and audience, vocabulary, language and text features, planning and composing, as well as levels of text construction.

It was hoped that by working through these activity sheets students would be able to produce correctly structured short and more complex sentences. It was also hoped they would be able to understand more about the relationships between words, especially to be able to select the correct verb form in the context of a sentence.

The second set of activities took place in SL. Students were given a brief orientation to the SL environment. Students were assigned a series of tasks to complete that required they visit the Red Mesa sim in SL. This is the Native American sim. The focus of the tasks was a comparison of North American and Māori cultures.

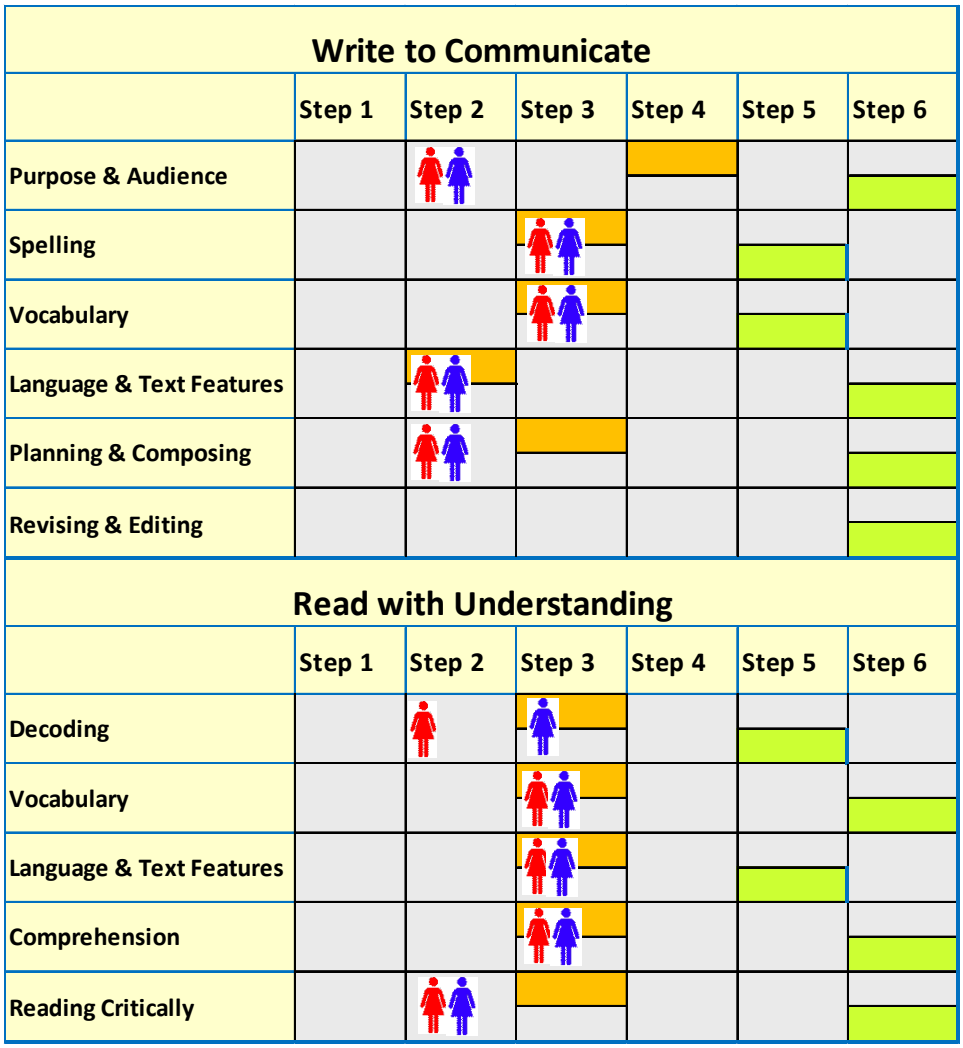

Figure 2. The diagnostic & course end objectives mapped against the Learning Progressions – students A & B also shown

The first task involved a structured overview using key words relating to North American Indian and Māori cultures. Students had to research their own culture for the keywords and then explore the Red Mesa sim for the North American Indian keywords and corresponding items, and then place the keywords in the correct place on the worksheet. These words were used for a subsequent writing activity.

The second worksheet was a series of short answer questions, with some of the vocabulary from the first task revisited. The activities were designed to address the Read with Understanding Learner Progressions, specifically addressing decoding, reading critically, moving into deeper levels of comprehension, from literal to inferential to critical, text using and text analysing.

Figure 3. Students at work in the Red Mesa, North American Indian sim

The aim was that by the end of the activity students would be able to understand key words relating to the two cultures and identify the way these words and ideas relate to each other. It was hoped that students would be able to move from just reading the words in each environment to using inference and critical reasoning to locate information. A further aim was that the students would need to actively participate in the text located, and analyse ideas to find answers.

The last task was a writing activity completed in pairs. Students had to choose one culture, the key ideas, and subject specific vocabulary. They then dictated in turns sentences using the key words and vocabulary. At the end of this activity it was hoped that students would be able to write together, structure the content using SEE (statement, explanation and example), select appropriate vocabulary and demonstrate appropriateness of language and the sequencing of ideas. Pair discussion was followed by group discussion. The goal was that students would address similar Write to Communicate Learner Progressions as with the homework sheets.

The teaching strategies and activities matched well. Both the homework sheets and the Second Life activity were well received and students reported favourably on both activities. There were several indicators of literacy gain. Student's self-evaluated the efficacy of what they had done and perceived improvement in their own skill levels. Vocabulary levels with the selected students showed notable improvement. Exam performance was another indicator. The selected students were writing far better and more accurately in their exam essays.

Student evaluations of the literacy activities revealed a high level of satisfaction with the SL activities. Students saw a great deal of value in learning more about a culture that

in so many ways paralleled their own. Students also reported a greater feeling of confidence with operating a computer and increased digital literacy.

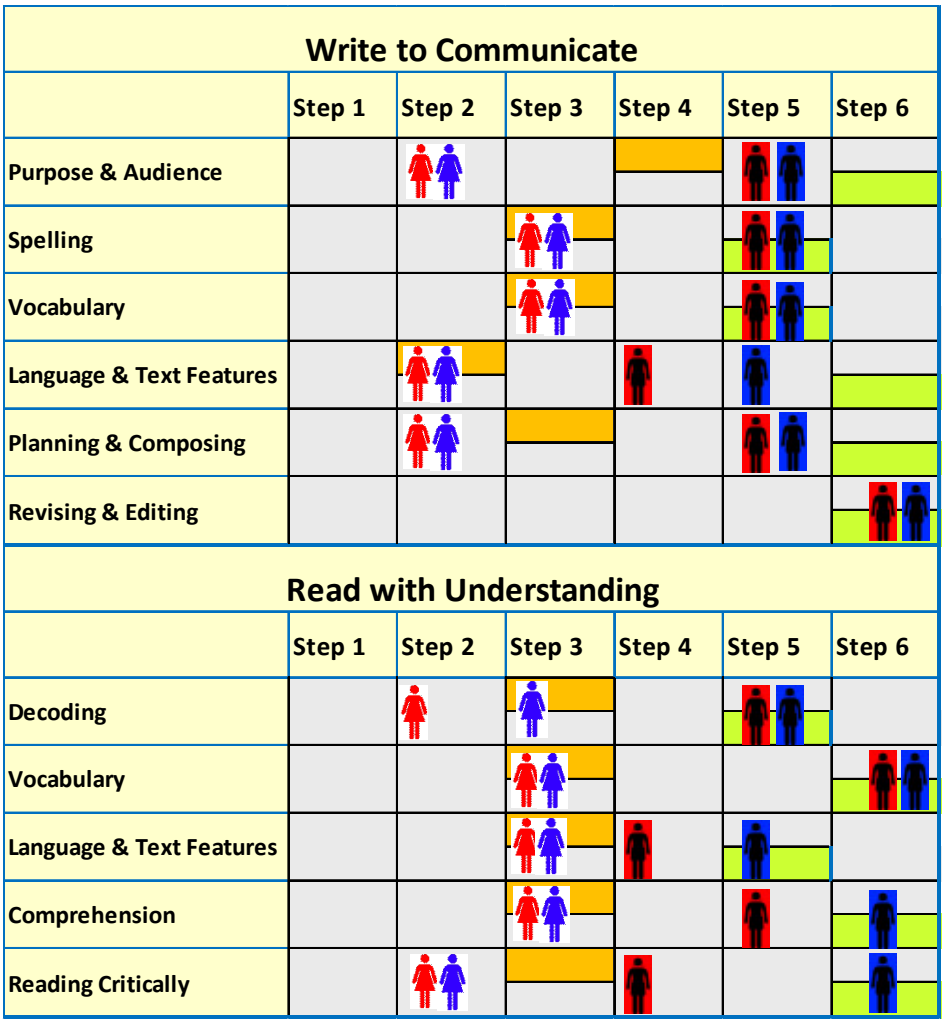

Figure 4. Progress of Student A & Student B

Literacy game in OpenSim

At Manukau Institute of Technology, a project to build a basic literacy game in a Virtual World is in the early stages of development. Once the game is fully functioning, it will be possible to change it quickly and easily into a game to teach Māori language, or even numeracy. It is proposed that the scenario created for the game be further developed so it can also be used as a tool for teaching TeTiriti(The Treaty of Waitangi) at Manukau Institute of Technology. Students will be able to role play as tangatawhenua (people of the land – Māori) and tauiwi (others – non-Māori) in the 1830s in pre-Treaty New Zealand.

The game proposed

The idea behind the literacy game is to help students recognise a well-structured sentence, to help them to identify a complete sentence and to help them identify solutions to common problems in grammatical structure. A scenario is being created in a Virtual World with the story based on Māori mythology.

The game will operate as follows:

- Students are divided into two teams. Each team has a route or journey to complete in order to find a "treasure".

- The two teams have different routes but they are constructed to be as similar as possible in terms of difficulty and skill required.

- Each route has 10-12 stops where students have an obstacle to overcome. Each obstacle requires a correct sentence to be constructed from a given bank of words. As soon as students type or say the correct sentence, the journey can be continued.

- The first team to complete all sentences and reach the "treasure" is the winning team.

The game will be controlled by scripts contained in Notecards. These Notecards are similar to small documents. Because of the ease of creating Notecards, the game can be changed to fulfil a different purpose by merely changing Notecards. This would take minimal effort and time.

Suggested games to emerge from the basic game are a Māori Literacy game using basic Māori sentences and possibly a Numeracy game where students would be required to complete an equation instead of completing a sentence.Almost any content could be added to the Notecards therefore there are few limits to the potential of the game once created.

Proposed advantages to this build are that the virtual world is an interesting environment where students become absorbed with the task at hand. Evidence of this has emerged from the SLENZ project and the subsequent use of the SLENZ Foundation build within the Future Focus course run by the Foundation School (Lemon & Kelly, 2009). The virtual world and the literacy game can be accessed by campus, blended and online students in multiple departments. There is evidence that retention and success are both enhanced by using a virtual world (SLENZ data) (Lemon & Kelly, 2009, p.8). Students generally have such fun they do not realize how many digital skills are being developed in the process(Ryan, 2008). The game also has Māori content embedded in the game and will, therefore, be seen as culturally relevant to Māori students, and there is the potential to add on a game that is aimed at enhancing skills in Te Reo (Māori language).

Figure 5. Māori elements in the literacy game – set in early NZ

Conclusion

According to the Oxford NZ School Dictionary, to integrate means to make parts into a whole, or to combine; or, to join together harmoniously into a single unit.So what does integration have to do with literacy? Wiltshire (2001) differentiates two approaches to integrated literacy. She specifically refers to bridging or foundation education where integrated literacy is more likely referring to the teaching of reading, writing, and maths skills in a holistic way. She also sees integration linked to the contextualising of literacy and numeracy skills and competencies in activities that are based around student life goals, learning interests, or career preparation and vocational training.

Gavelek, Raphael, Biondo, and Wang from Oakland University (2001) produced a review of the literature connected with integrated literacy. They stated: "Integrated literacy instruction turned out to be a far more elusive and far more complex area than we had ever anticipated." (p.24) Their review concluded that work still needed to be done in providing a unified conceptual framework and clear constructs based on research data. However, it is generally acknowledged that integration can and should be a goal for literacy educators.

In New Zealand the approach to Māori literacy has to be seen as integrated. Māori acknowledge that a person is multi-dimensional and that all parts need to be in harmony and all parts work together to provide health and literacy. To attempt to address the literacy needs of any student, Māori or otherwise, it is important to see them as multi-dimensional, to see all the experiences, values, abilities, past experiences they bring with them into the learning situation. Also, to lead them to where they need to be, it is important to make the learning relevant to where they need to be and link the learning to their needs.

Both initiatives discussed in this paper have aimed at integrated literacy that centres on student participation and engagement leading to the attainment of learning outcomes. The delivery shift to a Virtual World provides educators with an effective tool to improve literacy skills, contributing to personal achievement and life success.

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