



# GAMES, PROBLEM BASED LEARNING AND MINECRAFT



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This article is presented in three sections: first an introduction to the possible role of digital games in education. Second, a brief overview of project based learning and finally a 'lived' example of how these two areas of focus can be combined in a unit of work in a primary school context.

## Digital Games in Education: An introduction

Our students' experiences of society and culture are increasingly digital and their futures will involve digital workplaces. Their everyday lives are characterised by digital play and online interaction and their futures will involve digital workplaces, regardless of the career paths they follow. Beavis et al. (2014) argue that students have a right to learning opportunities that account for this reality but also allow them to develop the knowledge, skills and dispositions towards digital culture that will enable them to effectively and actively participate in diverse futures. Through their digital experiences, young Australians increasingly experience what Jenkins (2006) calls a participatory culture in which students are producers, not mere users, of digital culture. This has similarities to Lave and Wenger's (1998) notion of active participation which underpins the concept of communities of practice and online networks. Each student has the right to a rich connected ICT experience. In fact many would argue that depriving students from this experience or more specifically limiting a child's ability to connect to the Internet, is in fact depriving them of a basic human right. It is important that all schools embrace this new learning space, understand it and evolve and adapt their pedagogical approaches to reflect the change in learning. Digital games are one of the tools in this new space.

There is a rise in the use of digital gaming in educational settings and there has been a huge increase in the creation and development of digital games for learning. However, in many instances the games developed are merely replications for the type of teaching already occurring in non-digital classrooms. The digitising of them merely means that they are now available to be used on a device. They demonstrate little to no consideration for the new learning styles of modern children and once again attempt to replicate a method of reductionist information transferral, or to use another phrase, memorisation of fact and formulas. Most of them are closed form 'skill and drill' games rather than open exploratory games that allow for manipulation, reflection and other aspects of self directed or self managed learning. As Beavis et al. (2014) indicate, it is important that we move from seeing games as

simply a way to promote smarter transmission of information to exploring how games might promote deep learning in the discipline areas, teach critical reflective competence with new literacies, and promote imagination and creativity, through play, production, analysis and use.

Much of the research into digital games and learning has presented their findings within one of two frames. Either the frame of direct transfer of skills, which demonstrates how simulation games can teach skills and therefore impart knowledge (for example, see: Bowman 1982, Malone 1980, Prensky, 2000), or through the frame of theories of situated learning which shows how games provide new investments in learning and provides epistemic frames for creating new ways of knowing (for example, see: Barab & Duffy, 2000, Jenkins and Squire 2003, Shaffer 2006). Many online digital games also have powerful dynamic networks existing around the games. These networks are places where knowledge is stored and where new knowledge is co-created, providing powerful learning environments for students. Gee (2007) refers to the places that exist within the game itself but also around the game such as the network built up online around the game, usually existing online as affinity spaces. Hayes and Gee (2010) go on to define affinity spaces as "well designed spaces that resource and mentor learners, old and new, beginners and masters alike. They are the learning system built around a popular culture" (p. 188) like playing a game. This is a continuation of the network established in the game playing itself outside the direct parameters of the games structure, much like the wiki was being used in this unit, which I will discuss later.

The game Minecraft would place itself in the second frame, the frame of situated learning. Minecraft is not a simulation skills based game. Minecraft is Massive Multiplayer Online Game (MMO) and is also referred to as an open 'sandpit' game, which is played online. The term 'sandpit' refers to the style of game. It has little predetermined narrative. The game plays out mostly dependent on the collective imagination of the players involved. It is essentially a building game with noticeable similarities to Lego- a digital Lego perhaps. One enters the world and begins building. The way it was used at North Fitzroy Primary School was to establish a community of practice or a network within the game - the participating 136 children - nest that network within already existing networks and to observe that complex system.

## Problem Based Learning: Providing an overview of our project.

In my time at North Fitzroy Primary School we were a school very focussed on gaming in education (using digital games to teach). In 2012 we were awarded a Schools Specialisation Grant to focus in the area and as part of that we partnered with Deakin University to conduct research into the area. A portion of the research focussed on this Minecraft Unit.

Other games we used included Civilisation and Sim City to teach term long units on government and history. We have also done entire term projects on game making which included students looking at programming skills plus narrative development in grades 3/4 area. We used programs such as Scratch, Atmosfir, Sploder and Game Salad to do this. We also use a lot of games on mobile devices in the junior levels to enhance the numeracy and literacy program.

However, a major focus for our research was a Minecraft project that we constructed. Our use of Minecraft was situated within a term long project (10 weeks) comprising 136 grade 5 and grade 6 students over five classes. There were five individual teachers involved and I operated as a guiding coach and project facilitator. The unit's major area of focus was Science, specifically looking at areas including sustainability and biospheres. However, it did also involve content and curriculum from subjects including Geography, Design and Technology and Communication. It is also important to note that the unit was set within a Project Based Learning (PBL) framework. The PBL framework allows:

students [to] go through an extended process of inquiry in response to a complex question, problem, or challenge. While allowing for some degree of student "voice and choice," rigorous projects are carefully planned, managed, and assessed to help students learn key academic content, practice 21st Century Skills (such as collaboration, communication & critical thinking), and create high-quality, authentic products &

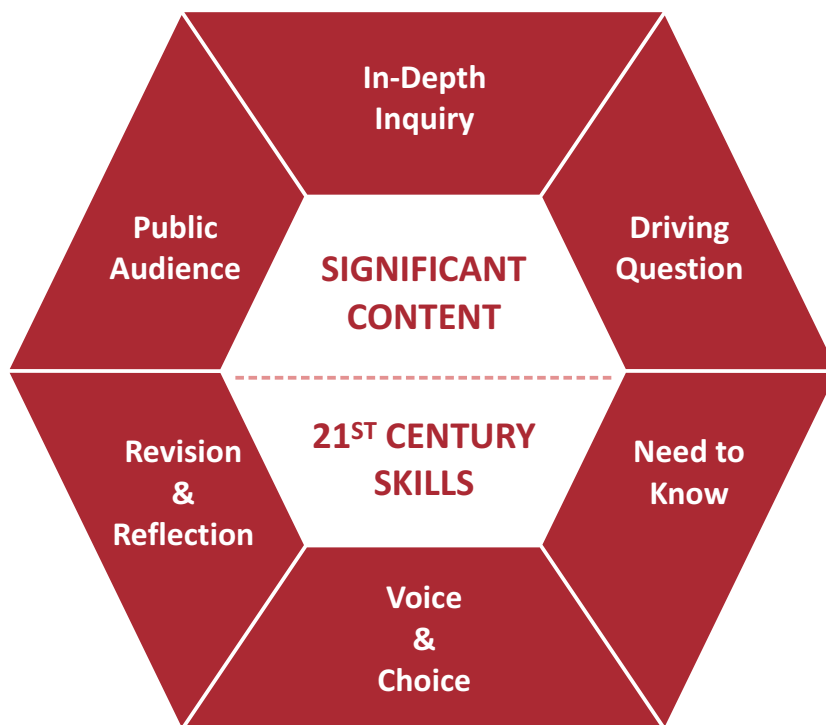
presentations. (Buck Institute of Education, 2013)

PBL was chosen as it displays a number of the key criteria set out by complexity theory (I will also speak of this later in this article), including openness and non linearity. Below is an image demonstrating what is considered the essential elements of a PBL project.

The 'driving question' is a key aspect of PBL and its aim is to be open enough to allow for flexibility and choice of direction within the project but focused enough that if participants are getting lost or unsure of relevancy they can constantly refer back to it with participants including both the students and the teachers.

Our unit of work centred on the driving question 'How do we sustain life on another planet?' To further focus the unit, the teaching team The driving question (which can be seen in the planning document below) for our Minecraft unit was 'How do we sustain life on another planet?' The introduction and project overview have provided a brief introduction to the context in which Minecraft was used in our school.

The final section of this paper begins with an over view of the initial planning document that was collectively written at the start of the term and was designed as a guiding document for the teachers to ensure that students and classes remained on track. The document was considered a dynamic artefact which meant that changes could be made at any stage dependent on where the learning was heading.



## PROJECT OVERVIEW

**Name of Project:** Mission Terraforma

**Duration:** 10 weeks

**Subject/Course:** Rich Learning Project

**Grade Level:** Level 4

**Other subject areas to be included, if any:**

Science (Food Chains, Ecosystems, Biospheres),  
Geography, Design and Technology, Communication

### Project Idea:

Summary of the issue, challenge, investigation, scenario, or problem:

It is the Year 2385 and the planet Earth is in chaos...

Climate Change has ravaged the land with food and drinking water now in short supply. Civil unrest, extreme poverty and disease are rampant, as global warming has caused disease, famine and a 5000% increase in the occurrence of natural disasters. Fossil fuels are all but gone as crises talks are held by the New World Order.

The New World Order has given you the last of its available resources so that you may attempt to terraform the planet MX73 - the closest planet with atmosphere composition similar to Earth. You land on MX73 and equipped with the creative tools at your disposal, your mission is to: Terraform Aurora 56Z and create a colony for the human race. Initially you are to create marketing material for prospective colonists. Good luck! The future of the human race is in your hands.

**Driving Question:** How do we sustain life on another planet?

### PROJECT MILESTONES

WEEK 2	WEEK 3	WEEK 4	WEEK 5
Planet Dying	Where to Go?	A New Home	Destination Planet MX73
<ul style="list-style-type: none"> <li>Introduce project idea and driving question</li> <li>Examine why we are leaving earth? Explore issues of climate change, sustainability, fossil fuels</li> </ul>	<ul style="list-style-type: none"> <li>Examine and compare the known planets in our solar system. Is life sustainable on these planets?</li> <li>New planet is discovered. What is it like? These are the atmospheric conditions of the planet – launch Wikispaces</li> <li>Minecraft &amp; Google Sketchup P.D.</li> </ul>	<ul style="list-style-type: none"> <li>What will we need to take to our new planet? Make decisions about what we will take.</li> <li>Spaceship design</li> <li>Develop council groups</li> <li>Minecraft &amp; Google Sketchup P.D.</li> </ul>	<ul style="list-style-type: none"> <li>What will we need to take to our new planet? Make decisions about what we will take.</li> <li>Begin spaceship design</li> <li>Develop council groups</li> <li>Rocket launch</li> <li>Minecraft &amp; Google Sketchup P.D.</li> </ul>



WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10
Landed	Terraforming	Where to Next?	What have we done?	Will we Survive?
<ul style="list-style-type: none"> <li>• Terraforming our new planet</li> <li>• Initial Council Meeting: Agriculture, Culture, Industry, Suburbia</li> </ul>	<ul style="list-style-type: none"> <li>• Terraforming our new planet</li> <li>• Council Reports on Wikispaces. Agriculture, culture, Industry, Suburbia</li> </ul>	<ul style="list-style-type: none"> <li>• Council reviews the work of another council and provides feedback and suggestions</li> </ul>	<ul style="list-style-type: none"> <li>• Council Meeting: determine presentation material and mode</li> </ul>	<ul style="list-style-type: none"> <li>• Share as a level, each council presents their work</li> <li>• Expert panel evaluates the success of the planet</li> </ul>

**Content and Skills Standards**  
to be addressed:

#### SCIENCE – Progression Point 4.5

Knowledge of factors which have impacted on the development of scientific ideas over time within chemical, physical, biological, earth and/or space science contexts

#### ICT – For Visual Thinking

Students begin to work in a collaborative global environment. At Level 4, students apply ICT tools and techniques to represent and explore processes, patterns and cause-and-effect relationships. Students use ICT tools and techniques that support the organisation and analysis of concepts, issues and ideas that allow relationships to be identified and inferences drawn from them.

#### Thinking Processes – Reasoning, Processing and Inquiry

At Level 4, students develop their own questions for investigation, collect relevant information from a range of sources and make judgments about their worth. They distinguish between fact and opinion. They use the information they collect to develop concepts, solve problems or inform decision-making. They develop reasoned arguments using supporting evidence.

#### Thinking Processes – Creativity

At Level 4, students use creative thinking strategies to generate imaginative solutions when solving problems. They demonstrate creativity in their thinking in a range of contexts and test the possibilities of concrete and abstract ideas generated by themselves and others.

#### Thinking Processes – Reflection, Evaluation and Metacognition

At Level 4, students use a broad range of thinking processes and tools and reflect on and evaluate their effectiveness. They articulate their thinking processes. They document changes in their ideas and beliefs over time.

		T&A	E		T&A	E
<b>21st Century Skills</b> to be explicitly <i>taught and assessed</i> (T+A) or that will be <i>encouraged</i> (E) by project work, but not taught or assessed:	<b>Collaboration</b> <ul style="list-style-type: none"> <li>Students collaborate across Level 4 to build and develop the new biosphere</li> <li>Students collaborate with their council group to plan and organise their area of the biosphere</li> </ul>	Y		<b>Organisation</b> <ul style="list-style-type: none"> <li>Students plan the project management that is required and develop an effective action plan for the biosphere</li> <li>Students allocate roles to ensure the tasks are completed appropriately</li> <li>Students ensure they have appropriate services for the community and are able to articulate these at the expert panel session</li> </ul>	Y	
		Y				Y
					Y	
	<b>Creativity &amp; Design</b> <ul style="list-style-type: none"> <li>Students create and design their space shuttle and terraform their part of the planet</li> </ul>	Y		<b>Communication</b> <ul style="list-style-type: none"> <li>Students will be required to effectively communicate with other students to ensure they meet the needs of their population</li> <li>Students will need to articulate their designs and achievements to the expert panel</li> <li>Students will promote and create marketing material for the planet</li> </ul>		Y
					Y	Y
	<b>Technology</b> <ul style="list-style-type: none"> <li>Students will use Minecraft to terraform and build the planet</li> <li>Students will use Wikispaces to record and reflect their progress with the project</li> </ul>	Y				
		Y				

## PRESENTATION

**Culminating Products and Performances**

**Group & Individual:**

Each council will present their work to an expert panel, which will evaluate the success of the planet and the potential for its long-term survival?

Class:	Y
School:	Y
Community:	
Experts:	Y
Web:	Y
Other:	

## PROJECT OVERVIEW

**Entry event** to launch inquiry, engage students:

**It is the Year 2385 and the planet Earth is in chaos...**

Climate Change has ravaged the land with food and drinking water now in short supply. Civil unrest, extreme poverty and disease are rampant, as global warming has caused disease, famine and a 5000% increase in the occurrence of natural disasters. Fossil fuels are all but gone as crises talks are held by the New World Order...

**Assessments**

**Formative Assessments (During Project)**

Peer Evaluation  
Councils peer evaluate each others district and the developments they have made. They provide feedback and suggestions to one another.

Y

Preliminary Plans/Outlines/ Prototypes  
Students will plan the terraforming of the planet and also the design for their space shuttle.

Y

**Summative Assessments (End of Project)**

Self-Evaluation  
Students will self evaluate their additions to the planet.

**Resources Needed**

**On-site people, facilities:**

Minecraft Server

**Equipment:**

Laptops

**Online Resources:**

Minecraft [www.minecraft.net](http://www.minecraft.net)

**Reflection Methods**

**(Individual, Group, and/or Whole Class)**

Reflection 1: Initial  
Reflection 2: Mid term  
Reflection 3: Final

Y

Whole-Class Discussion

Y

## Project Idea: a context for the use of Minecraft

*It is the year 2385 and the planet Earth is in chaos.... Climate Change has ravaged the land with food and drinking water now in short supply. Civil unrest, extreme poverty and disease are rampant as global warming has caused disease, famine and a 5000% increase in the occurrence of natural disasters. Fossil fuels are all but gone as crises talks are held by the New World Order. The New World Order has given you the last of its available resources so that you may attempt to terraform the planet Aurora 56Z - the closest planet with atmosphere composition similar to Earth. You land on MX73 and equipped with the creative tools at your disposal, your mission is: to Terraform Aurora 56Z and create a colony for the human race. Additionally you are to create marketing material for prospective colonists. Good luck! The future of the human race is in your hands.*

So began a 10 week unit of inquiry at North Fitzroy Primary School in term four 2012. North Fitzroy Primary School is an inner city primary school in Melbourne, Australia. I had been working at the school for approximately 10 years. The unit's major area of focus was science, specifically centred on sustainability and biospheres. Most of the unit was taught through the game Minecraft and the premise of the unit was "our world is ending due to unsustainable practices. We are moving to a new planet, Aurora 56 Z. We need to rebuild a new and smarter civilisation. Our new planet exists within the game Minecraft."

136 students, five individual teachers and I were involved. My role was as facilitator and guide. While I did not have my own class I worked with the teachers to plan the unit and help deliver it. I also worked as a mentor to the teachers, offering advice when needed. My position at the time of the research was that of Leading Teacher in the school, with a focus on ICT (Information Communication and Technology), creativity and innovative learning and teaching. This role had peaked my interest in digital gaming in education.



As the name Minecraft implies players need to mine for resources in order to build. The first task most players do is use the given axe to chop down a tree in order to collect wood. That wood is used to build a house. As one progresses in the game, stronger resources and subsequent abilities become available, for example, the ability to collect or mine stone, red stone (a system of electronics enabling a player to turn switches on and off), diamonds and other materials. Each progression allows the player to build stronger and more elaborate structures. The initial world one enters has all the properties of an unsettled land including water, trees, natural resources and terrain such as hills and mountains. What one does inside the world is almost entirely dependent on one's imagination.

As the world we currently lived in was rapidly disintegrating, the cohort was now moving to a completely undeveloped, newly discovered planet and was required to settle in it. The settlement and development and building process was to display evidence of learning around the key content areas (biospheres and sustainable practices). Everything that was built on our new planet had to represent learning and research that the children were doing in the areas of sustainable biospheres.

Obviously this project involved a high degree of role-playing. The imaginary planet, titled Aurora 56Z, that humanity was now to inhabit, was built within the Minecraft game. The use of the game Minecraft was an extension of the role-playing. It is an example of using games to provide experiences that could not have previously been possible. The building of this planet would encompass all the learning that the students were doing



about sustainability and biospheres. Examples of structures that were built within the game included

- Wind farms
- Farms based on sustainable farming techniques
- Research Centres for Education
- Parks
- Drainage systems
- Space station for further discovery of other planets
- Art works
- Desalination plants
- Seed Pods
- Libraries, Universities and Schools
- Recycling Centres

As part of the unit a Wiki was also used (<http://aurora56z.wikispaces.com/>). A wiki is a web site, which allows users to upload content, comment on each other's content, modify content and collaborate. In this instance the Wiki was a place for the students to reflect on their learning. All the students' research, discoveries, reflections on learning and ideas were presented in the Wiki. Each child had its own page. The Wiki was public, meaning it was viewable by everybody. This meant that all involved in the unit (teachers and students) could see each other's reflections, (a visible representation of the learning process), provide feedback on each other's work and find appropriate people with whom to collaborate and form working groups.

The unit aimed to draw on much of the literature written on complexity thinking and education. Complexity theory indicates that when you have a collection of interacting agents that can communicate within a complex system and the system is fighting for a limited resource and there is no centralising 'god-like' figure controlling the system a thing called emergent phenomenon will arise out of the system. Emergent phenomenon is phenomenon cannot be predicted by prior knowledge of the individual agents – it arises like magic out of the system. Levels of the emergent phenomenon plus the survival of the system is dependent on feedback provided to the system, feedback from prior memories and the ability within the system for communication. The system is open, always changing dynamic, flexible evolving and adaptive and there is a balance of order and disorder. This theory was used extensively in our approach to the Minecraft project. As mentioned earlier in our Minecraft project we had 136 students building a new world in a MMO (Massive Multiplayer Online Game). They were all in there building at the same time. I would describe this as a complex system and the observance of the emergent phenomenon was eye opening.

## Observations from the unit

Two key themes emerged as significant when we reflected on our observations from this unit: self-directed learning and feedback.

## Self directed learning

One of the initial discoveries we can observe when reviewing this project was in regards to the intended learning outcomes, based on VELS (Victorian Essential Learning Standards, Victorian Department of Education, 2012). These were covered in approximately two weeks. From that moment on the project was almost entirely driven by the students. The learning became much more 'personalised' and self directed (existentially realised by the participants). Below is a brief narrative example from one of the teachers, which supports this claim:

Energy was needed to fuel our new planet and a decision was required on what type of energy to use. The students had decided that collectively they would research and report before any major construction could occur within the Minecraft world. This was to create order within their new world. Initially, people were chaotically building anything anywhere.

Once the decision on what to build had been collectively decided, the students could then start building the required infrastructure on our new planet – Aurora 56Z. The decision around a suitable energy source was charged to students working within the Industry District. Based on the student led research being done around sustainable energy sources, most members of the district decided to build wind farms to create energy. However one child was anti-wind farms. He was insistent that nuclear power was the correct decision. His argument was based on solid research he had done on his own.

He had researched nuclear power versus wind farms. He had begun researching the potential consequences and benefits of using either one as a primary energy source. He began investigations in what nuclear power actually was (splitting an atom), the need for rapid energy (wind farms would take too long) and could not provide sufficient base power capacity.

This child was researching areas of science, that we as teachers hadn't initially considered teaching. The student was pushing into areas of personal interest. His learning was becoming self-directed. That child then vehemently argued his case through interactions within the Minecraft environment, the Wiki and in face-to-face discussions. In the process this provided additional learning for all about nuclear energy and the science which supported it. He still failed to convince the group. So wind farms were built.



Wind farms were chosen as the source of energy and subsequently built in the game.

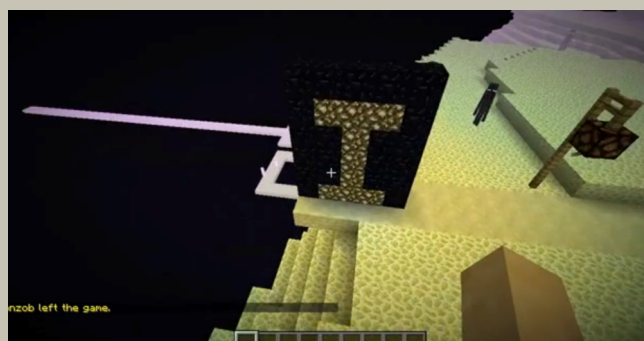
## Feedback – within the game and through a Wiki.

The game Minecraft and the server that the participants inhabited also acted as a complex system within our project. Initially it had very poor internal communication and feedback systems built into it. The students were 'building on top of each other'. For a system to evolve, the agents within the system must be able to communicate. Feedback is a requirement for adaptation. The way this system developed its own methods of improving communication and the ability to feedback to itself was very interesting. Initially the students demanded that a bureaucracy be brought into place and the system to be internally managed. Districts were invented and each student aligned himself or herself to a district of interest. That district was responsible for researching and self-educating around points of need for our new planet. It was also responsible for building within the Minecraft server, dependent on the learning and finally it was responsible to feedback the learning and progress to all the other districts. The chosen districts were:

- Agriculture
- Industry
- City and Culture
- Recreation
- Discovery and Education

Communication of this student devised bureaucratic structure and subsequent structures were done through all participant meetings held on a weekly basis, through emails, online chat and communication methods within the game. Below are a couple of examples of communication within the game,

including the chat function situated in the bottom left corner of the screen and in built communication methods devised by the students themselves.



The large "I" was a communication symbol designed by the students. It represented the Industry District and was used to help in the demarcation of land to build on.

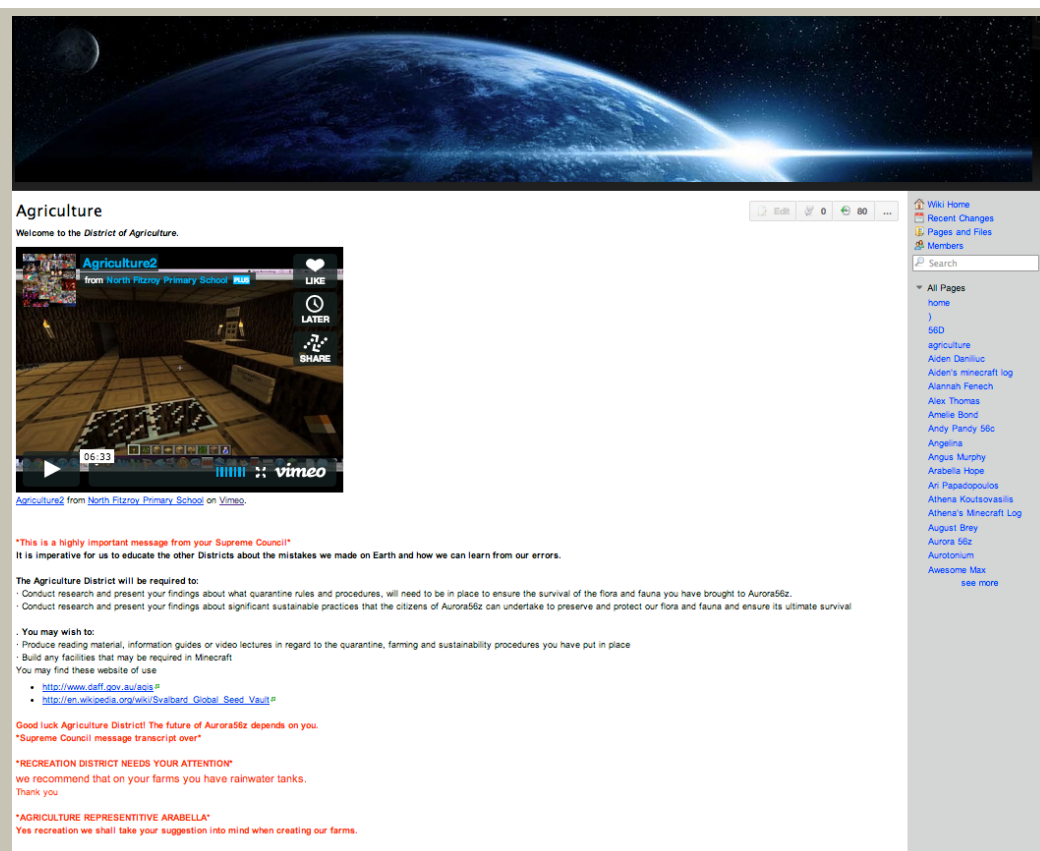


A further example of internal communication – rules were created by the students and posted to sites within the game.

The final communication device used was the development of the WIKI.  
The WIKI was constructed in the following way:



Front page with guiding question and project idea. This also had hyperlinks to the district pages. All the student pages are listed on the right hand side of every page within the wiki.



District pages – to be used to demonstrate thinking, learning and argue cases for further development/building in the Minecraft world



## Kalani Robinson

H all,  
This is Kalani Robinson, C.E.O of Robinson Industries. Here is the link to my Ark proposal.  
[ark\\_proposal](#)

**The building stages**

**DAY 1 DATE: week 7**  
All of 5/6 Ds Industrial district members have met together to discuss the first stages of our building in minecraft.  
I also met with the members of Agriculture district to discuss some sort of trade between the two districts.  
We are trying to find/build an energy source to power Aurora. One of our members has come up with a clever use of steam that doesn't involve coal. I have also began on a project to de-salt the water with a machine in minecraft.

**DAY 2 DATE: week 7**  
I have finished the main machine for de-salting the water system with the help of Ryan (a fellow Industrial member), unfortunately I have now discovered that Industrial is not in charge of the water project. I will begin talks with the district that is. We also started a new machine to help with the power system of Aurora.


**DAY 3 DATE: 23/11/12**  
I have finished talks with recreation, the district in charge of the water project. They have agreed to let us complete our machine. One of our members has begun on a project for a clean energy system. I have been looking into a project to mine for Aurorium, the rock that may have powerful properties and could be used to power Aurora. I am working together with Ryan to find the perfect spot to set up a mine. I have also been made an OP, which carries certain "responsibilities" as they say. So thats going to be "fun"

**DAY 4 DATE: 26/11/12**  
We had our first "OP meeting today," we discussed multiple topics, including command blocks, grieving, stuff like that. Today I realised that being and OP isn't all fun, when Ryan (the other OP from our class) wasn't at school today and everyone kept coming up and asking e to do things on minecraft.

**DAY 5 DATE: 4/12/12**  
I haven't updated much lately, however I do know that I have started a project to build a control tower for my other projects (like the hydro station) I have decided to build on the water front, right next to some caves, which will be grate for mining, not much more to say.

**DAY 6 DATE: 5/12/12**  
I logged in to minecraft today and found the first 3 floors of my control tower have been blown up, not happy I decide that the only thing I can do is rebuild. Though i'm not happy about, I hope that the supreme council can find out who is responsible for this.

**DAY 7 DATE: 7/12/12**  
I have recently been asked to make a quick walk through video of one of my creations, I have decided to do it on the hydro station. Its just a quick walkthrough on the place, here it is...



- Wiki Home
- Recent Changes
- Pages and Files
- Members
- Search
- All Pages
  - home
  - J
  - 56D
  - agriculture
  - Aiden Daniiluc
  - Aiden's minecraft log
  - Alannah Fenech
  - Alex Thomas
  - Amelie Bond
  - Andy Pandy 56c
  - Angelina
  - Angus Murphy
  - Arabella Hope
  - Ari Papadopoulos
  - Athena Koutsouvasilis
  - Athena's Minecraft Log
  - August Brey
  - Aurora 56z
  - Aurorium
  - Awesome Max
  - see more

Individual students pages - to be used to demonstrate thinking, learning and argue cases for further development/building in the Minecraft world. As is evident in the above screen shot, reflection of learning occurred in the wiki space using a variety of media including text, video and images.

As everybody could visibly see everybody else's page, the Wiki was also a place that the students provided feedback to each other through the comment section. Teachers also used this section to provide feedback to every child.

## The Districts

**\*URGENT TRANSMISSION FROM THE SUPREME COUNCIL\***  
It has come to our attention that the construction of the Districts is occurring to the detriment of the environment. The Districts must produce a plan to offset the damage caused to the natural environment of Aurora56z



[Mava Jin - Unchopping a Tree](#) from [What is Missing? Foundation](#) on [Vimeo](#).

The Districts have been designed to cater for all our needs. Each District works for the mutual benefit of the others. The Districts are autonomous - they are independent and rule themselves. The first four Districts established were Agriculture, Industry, City and Culture, and Recreation. However, it was soon realised that a District for Discovery and Education could add great value to society. It is expected that further Districts shall be created as needs arise.

[Agriculture](#)  
[Industry](#)  
[City and Culture](#)  
[Recreation](#)  
[Discovery and Education](#)

**\*URGENT TRANSMISSION FROM SUPREME COUNCIL\***  
The Supreme Council hereby decrees that each District is to begin construction. To accompany this program, each District is also instructed to fulfil its scientific requirements. The decrees will come into effect shortly.

**\*Incoming transmission from city and culture district\***  
If you have an idea how we could dispose or keep our waste environmentally friendly way please comment on Alex Thomas's page. Please comment appropriately!  
**\*END OF TRANSMISSION\***

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  - J
  - 56D
  - agriculture
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  - Athena Koutsouvasilis
  - Athena's Minecraft Log
  - August Brey
  - Aurora 56z
  - Aurorium
  - Awesome Max
  - see more



The teachers would often ask questions within the wiki space. These questions were attempts to influence the learning and to keep the project “on track”. The teachers' comments were written in red for two reasons:

1. By altering the colour from the standard black it was a point of difference. The students became aware that when red text appeared they were to refer to it and decide on how to proceed.
2. It was felt that by making it red, it fit with the role-playing theme of an “urgent transmission” coming through to the inhabitants of our new planet.

#### Minecraft

1: We have been constructing a farm and a barn for animals. So far, so good, although animals have been escaping into other areas. We have fixed that problem though. The barn is going nicely, a nice building that will easily be able to keep chickens if need be. The point of this is to have animals and barns for storage. We decided to build right near trees for that extra, environmental boost.

2. I have created a plant house, made out of glass, the plant house will provide sunshine for it's contents. We will be watering them ourselves from the purified water that we collect from 5/6D industrial's water dam. The point of this is to have plants and crops for use. Food and water.

3. Isaac and I have been creating an underwter water source. Its purpose is to "water" our plants and farm stuff from underneath.

4. Okay supreme council...

4.1 I said that the trees give the boost, though shade is a good bonus for animals to keep coll.

4.2 I made the plant house with glass so that I can see their progress and so the sun above is amplified.

4.3 The underground water source is for plant growth and animal coolness. We made it underground because both the animals and plants are covered by things.

+++++++Transmission from Supreme Council+++++++

Ben, please answer the following in further detail:

1. Why does the shade give the farm an "extra environmental boost?"

2. Why does the plant house require to be made out of glass? Glass is very expensive? What is the benefit of this?

3. What is the purpose of your underwater water source? Why not above ground?

+++++++

Example of an internal transmission (in red) used to guide the learning.

#### Power Sources

##### 1. Would you like us to produce your power in a renewable or non-renewable manner?

- ☐ Renewable
- ☐ Non Renewable
- ☐ Other (please specify)

##### 2. What renewable resource would you want?

- ☐ Biofuels
- ☐ Solar

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An example of student generated surveys created and embedded into the wiki to assist with communication.

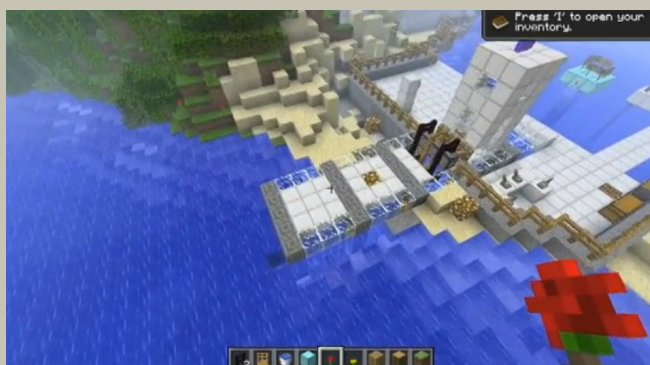
Finally as part of the process involving public audience, a panel day was created in which the students as organised districts, had to share their learning and take questions from a panel to justify their decisions on what they had built. The panel consisted of local experts including a professional scientist, a science lecturer, a representative from the Department of Education, the head of ABC Education and the principal of the school. Typically after each district had presented, a panel member would quiz them on their construction and its

relationship to sustainable practices; for example, “Why did you build a desalination plant and can you explain the process of desalination?”

For me as an educator and researcher, this project example demonstrates what makes contemporary education, with its strong links to the digital world, so exciting. No longer are students locked in to the reductionist methods of education prevalent in much of our education systems. Rather, there is a diversified world within which students can navigate, collaborate, co-create and communicate.

How is ICT changing the way we learn? How can we best utilise this to enhance creativity and innovation in students?

For me, the above questions are essential and link to some of the primary aspects of human creativity. Through the incredible creativity that is evident in all life, our biosphere has constantly adapted and evolved. This creativity is “ceaseless in the natural universe, biosphere and human culture.” (Kauffman 2010, p.xi) and this creativity emerges naturally from the self-organising, non-linear process that is life. How can we enable an education system that acknowledges and embraces the complexity of life, in contrast to the reductionist system so prevalent in most western education? How can we create learning environments that supports emergent creativity and which better reflects the new scientific thought that is complexity theory?



A desalination plant was built to supply the colony with water.



An aerial shot of a farm built by the Agriculture District using sustainable farming techniques.



A space station was deemed necessary in case this planet proved unsuccessful and further exploration was required.

## References

Beavis, C, Dezuanni, M, O'Mara, J, Prescott, S, Rowan, L, Wyatt-Smith, C, Zagami, J, Yam San Chee 2011 - 2014, *Serious play: using digital games in school to promote literacy and learning in the twenty-first century*, Australian Research Council Linkage Project LP 110200309.

Bowman, R. (1982). A pac-man theory of motivation. Tactical implications for classroom instruction', *Educational Technology*. 22, (9) 7-14

Gee, J.P. (2003). *What video games have to teach us about learning and literacy*. New York: Palgrave Macmillan.

Gee, J.P. (2004). *Situated language and learning: a critique of traditional schooling*. London: Routledge.

Gee, J.P. (2007) *Good video games and good learning: collected essays on video games, learning and literacy*. New York: Peter Lang.

Gough, N. (2012). Complexity, complexity reduction and 'methodological borrowing' in educational inquiry. *Complicity: An International Journal of Complexity and Education*. 9, (1), 41-56.

Hayes, E and Gee, J (2010) Design Resources and Affinity Spaces. In *Handbook of Public Pedagogy: Education and Learning Beyond Schooling*. Sandlin, J. A., Schultz, B. D., & Burdick, J. (Eds.) New York, Routledge, pp185-193.

Buck Institute for Education (2013). *Project based learning*, retrieved October 10, 2013, from: [http://www.bie.org/about/what\\_is\\_pbl](http://www.bie.org/about/what_is_pbl)

Kauffman, S. (1995). *At home in the universe*. New York: Oxford University Press.

Kauffman, S. (2010). *Reinventing the sacred: a new view of science, reason, and religion*. Basic Books.

Lave, J., & Wenger, E. (1991). *Situated learning: legitimate peripheral participation*. Cambridge: University Press.

Wenger, E. (1998). *Communities of Practice. Learning, meaning and identity*. Cambridge: Cambridge University Press.

Malone, T. (1981). 'What makes things fun to learn? A study of intrinsically motivating computer games', *Pipeline*, 6 (2), 50-51.

Prensky, M. (2000). *Digital game based learning*. New York: McGraw-Hill.

Shaffer, D. (200) *How computer games help children learn*, Macmillan.