Digital citizenship through game design in Minecraft

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Abstract

Purpose – This study aims to describe a library project exploring innovative options for embedding information literacy skills in the elementary school library by utilizing Minecraft, a virtual world three-dimensional (3D) building game environment.

Design/methodology/approach – The small-scale descriptive study, with a follow-up survey, focuses on a group of fifth-grade students in an after-school technology club facilitated by the school librarian. The students designed and built a 3D virtual world library game for younger students to help them learn digital citizenship and information literacy.

Findings – Analysis of observations, interviews and videos indicated that students were highly engaged in learning information literacy elements throughout all stages of the project from design, building, implementation and testing of younger students.

Research limitations/implications – Although the small number of students enrolled in the club is a limitation, the feedback provided strong evidence of motivation for learning through gamification. Further research could assess learning outcomes with the curriculum, specifically for digital citizenship and information literacy.

Practical implications – Embedding information literacy into a 3D world allows students to learn computer code, mathematics, game design, and fosters collaboration while demonstrating digital citizenship.

Social implications – Game design requires teamwork, a real-life skill essential for students entering the workforce.

Originality/value – Few articles share student-designed solutions of critical information literacy needs. This study exemplifies constructivist learning in a gaming environment.

Keywords Information literacy, Virtual worlds, Game design, Digital citizenship, Minecraft, Technology clubs

Paper type Case study

Introduction

Students today live in global digital participatory culture with instant access to information in their pockets on mobile devices. Through both consuming and creating online content, twenty-first century learners are prosumers, a term first coined by Alvin Toffler (1980). Global digital networking raises issues of privacy, cyber safety, digital etiquette and critical evaluation of resources. Realizing the need to promote digital citizenship and twenty-first century standards for learning alongside the rising popularity of video games with young people, the librarian in this case study provided the opportunity for students to design and build a digital citizenship game in the popular virtual world of Minecraft.
Literature review

Gaming in education

Over the past few decades, videogames have risen in popularity, and embedding educational curriculum and criteria seems to be a natural extension. Gee (2003) proposed that videogames are not merely entertaining, but “they build into their designs and encourage – good principles of learning, principles that are better than those in many of our skill-and-drill, back to basics, test-them-until-they-drop schools”. Good teachers have always understood that the human brain loves to learn, build and create.

Educators see the potential of game design concepts for promoting learning. In fact, videogames are now being considered an emerging literary genre (Mastel and Huston, 2009). One of the most popular games in the world for young people is Minecraft, with 110 million children registered in 2014 according to Kzero (2014), a consulting company specializing in measuring online use of virtual worlds. The Horizon Report (NMC, 2014), published by an international community of experts in educational technology, predicts gaming and gamification to increase as one of six current important trends in technology within schools. “With thousands of children playing in their free time, and learning math and design skills along the way, school leaders are taking increasing note of Minecraft’s potential for learning” (NMC, 2014, p. 39).

Minecraft is an award-winning game, originally created by Markus Persson, developed by Mojang in 2009. An educational version, MinecraftEDU, was developed in 2011. Players create and build in this sandbox-style game, using three-dimensional (3D) textured cubes in various gameplay modes: survival mode, creative mode or adventure mode. Players can build alone or together, on a shared server, through exploring, gathering resources and crafting. Daly (2012) explains that Minecraft is an open-ended creative computer game which has potential for teaching just about anything from math concepts and computer programming to geography and storytelling.

Librarians have begun using Minecraft in library programs, such as creating game spaces for teens or youth, housed on private servers where young people can create and build. For example, Connolly (2013) shared a virtual game project for youth in Minecraft with puzzles, game challenges and a giant tower along with a Hunger Games-style battlefield, developed by Virginia public librarians, Matthew Williams and Sarah Vaughn. Young adult librarians have discovered that teens enjoy building and collaborating in virtual spaces but often need monitoring to be sure they are not bullying or “griefing” others. The term griefing means intentionally destroying others virtual goods or bothering someone in a virtual game space. Gauquier and Schneider (2013), two YA librarians, came up with a way for teens to monitor themselves in a “Minecraft court of law”.

Bulu (2012) showed that utilizing immersive and collaborative spaces for education includes understanding different types of presence: place presence, social presence and co-presence. This “sense of presence” is simulated in 3D virtual worlds more effectively than online interactive Web sites or webinars, in which participants are mostly viewing from afar while being fully aware of the physical world around them (classroom or other place). Videogames and virtual worlds provide participants with immersive experiences, which will become even more life-like in the future as augmented reality and virtual reality tools emerge, and constitute a ripe new ground for constructive learning.
Constructivist learning theory

Constructivist learning behavioral psychologists, such as Dewey and Vygotsky, believed that children learn in a social context (Duffy and Cunningham, 1996). In the twenty-first century global participatory digital culture, new tools are available for students to collaborate and learn in networked society on mobile devices, such as iPads or laptops with innovative games and apps. Constructivist learning is taking on new platforms for collaboration across space, which include the capacity for live synchronous interaction. Hyslop-Margison and Strobel (2008) suggest these innovative learning tools do not guarantee that knowledge is constructed and misconceptions about constructivist learning often arise. One cannot simply assume that, through construction, knowledge is born. “Students learn that their constructed beliefs do not necessarily qualify as knowledge and that knowledge emerges from sources other than their own individual cognition” (Hyslop-Margison and Strobel, 2008, p. 79).

Collaboration and learning in a social context require guidance through best pedagogical practices or the digital tools are nothing more than social chat on a grand scale:

From the social constructivist perspective, the instructor – contrary to some misguided constructivist views – remains a pivotal classroom figure by creating activities that direct students toward subject mastery and that promote a certain level of cultural assimilation (Hyslop-Margison and Strobel, 2008, p. 81).

Understanding digital citizenship requires guidance from educators alongside the potential for personal interest and responsibility encouraged by constructivism.

Adult librarians have been collaborating in virtual world spaces for several years, according to Webber and Nahl (2011) and Hill (2012); but the use of virtual environments for student collaboration has been slow to develop because of privacy and safety concerns. Better ways to teach cyber safety and assure privacy for students working with collaborative tools continue to emerge in numerous formats, such as apps, Skype, e-learning platforms or social media, for example. All learners, from infancy through adulthood, learn best through social modes and personal interest, according to the constructivist learning theory. Harnessing the power of collaboration for networked culture, while promoting deep learning, is the current challenge for educators.

Sizemore and Marcum (2008) explored constructivist learning theory in the library field through teaching student research skills using portfolio construction instead of the traditional classroom lecture. Findings showed that students learned to successfully navigate the research through discussion, flexibility and personal interaction. Johnston and Marsh (2014) described embedding information literacy through mobile technology with iPads and iBooks, documenting the collaborative process.

Learning in global participatory digital culture is collaborative in nature, as students have both synchronous and asynchronous access to information and social networks. Child behavioral psychologist Vygotsky (1978) believed learning is a social endeavor, achieved in a social context not in isolation. As more educators understand constructivism and become facilitators of collaborative learning, new modes of presenting information in the classroom, such as project-based learning, are sweeping the globe. Markham (2011) explains that project-based learning means guiding students toward deep inquiry through narrowing a driving (essential) question.
Over the past decade, as more young people spend time in virtual spaces on digital devices, such as laptops, mobile phones, tablets and computers, the need for digital citizenship has rapidly increased. Rivero (2014, p. 6) explains: “Teaching digital citizenship leads to the discussion of issues such as cyberbullying, online privacy, sexting, digital footprints, online image, reputation management, acceptable use policies, and much more”. Heaser (2012) designed collaborative lessons, as a school librarian for K-5, to answer the essential question “How do you become a responsible digital citizen”? Working with teachers, Heaser developed lessons on topics such as personal privacy and plagiarism online.

The American Library Association (2007) provides standards for the twenty-first century learner, corresponding to digital citizenship, and a plethora of helpful resources for librarians and teachers are also found online at commonsensemedia.org (Common Sense Media, 2014). Individual educators can earn digital citizenship certification through commonsensemedia.org, as well as digital citizenship certification for an entire school campus. Understanding privacy issues, safety concerns, accuracy of online information and digital footprints are some of the important information literacy elements that need to be taught, starting at an early age.

Library educator, Moreillon (2013), believes school libraries are the perfect place for teaching the nine elements of digital citizenship. These elements include access, commerce, communication, literacy, etiquette, law, rights and responsibilities, health and wellness and security. Respect for intellectual property and responsibility for evaluating online content can be emphasized at a young age. Ribble (2014) defines digital citizenship as “the norms of appropriate, responsible behavior with regard to technology use”.

Minecraft library project background

The idea

The Minecraft school library project began with the school librarian exploring MinecraftEDU for options in setting up a private server to allow fifth graders to interact in a private, safe online space with the purpose of promoting digital citizenship. The small group of students, like millions of other children around the world, were already familiar with the building tools and options in Minecraft. Clear objectives were set at the onset to ensure students were aware of the educational purpose, agreed to stay on task and understood the focus of the project would be digital citizenship (modeling best practices). Students were chosen on a first come/first served (first to return parent permissions slips) basis and membership was limited to only eight students. Those eight fifth-grade students returned parent permission forms with a notice of informed consent, constituting agreement to be interviewed and/or recorded. Parents were informed of the educational purpose of the after-school club and given information from the Horizon Report regarding the prediction of gamification to impact education over the next two to five years (NMC, 2014). The Minecraft project took place over the course of six months from October 2013 through April 2014 (Plate 1).

Methodology

The librarian gathered data on the Minecraft club project through a threefold triangulation method: observation, interviews and mixed reality videos (machinima shots filmed inside the computer game and shots of the students in the real world). Field
notes were written and collected in a file folder along with parent permission forms, instructions and troubleshooting tips. The interview questions and answers were added to the field notes folder and kept locked in the librarian’s office. A private digital folder was kept on the school server to house the video shots of the students and the machinima captured inside the videogame as the students built the digital environment in Minecraft. These video shots and machinima clips were edited together at the end of the project.

**Research design**

The first step in the Minecraft club project was to obtain permission from the school district to purchase a class set of MinecraftEDU student gift-codes, along with the licensed software from Mojang in the amount of $376.00. A proposal to pilot the after-school program was approved with the agreement that findings of the case study would be shared with other librarians and educators in the district. Unused gift-codes would be used for the next school year (which is currently being done with a new group of students), so the librarian could choose the number of students in the initial project, allowing time to become familiar with the virtual world interface.

Learning the elements of information literacy, particularly digital citizenship, was the librarian’s overarching objective for the students and the purpose of starting the Minecraft club project. The students had all been in Minecraft, either as beginners or well-experienced users, but had not worked simultaneously in the same world. Prior to the project, the librarian had taught information literacy in the school library for grades K-5 and earned digital citizenship certification from commonsensemedia.org. The Minecraft club students were challenged to analyze digital citizenship and embed the elements into the game, designed by themselves.

After school, the Minecraft club met in the school library with the librarian sharing specific digital citizenship resources to support writing clues which the students hid in the 3D world as part of the game quest. At first, each of the students exhibited a strong desire to build “my own home” in the virtual world. Within two weeks, the students were observed choosing roles, such as lead builder, game designer, writer (of the questions)
and redstone electrician. Redstone is the program code that allows users to script and move objects within the game of Minecraft.

The librarian was particularly interested in noting that the children were already familiar with much of the programming code of Minecraft, but some were better at building, some at scripting and some at designing. Those unique abilities led to a natural progression of teamwork. Through access of creative mode (one of the game mode options available in Minecraft), the students placed emphasis on design and content without any combat or zombies, which are often associated with Minecraft’s survival mode.

Over the course of several months, through constructivist learning, the students built a virtual world library, garden, floating computer laboratory, treehouse, tennis court and secret chambers with digital citizenship questions hidden in treasure chests throughout the game quest. When a game player answered a question correctly, they were able to open a door to move toward the next challenge by flipping a lever. During the past few weeks of the project, each Minecraft club team member was given the opportunity to choose a younger student, from third or fourth grade, to come into the game as a “tester”. These testers would complete the quest to become digital citizens and earn the prize: a digital citizenship crown (Plate 2).

All of the students discussed the digital citizenship elements found in the resources provided by the librarian and narrowed them into suggested situational concepts. The questions placed in the Minecraft Digital Citizenship game were as follows.

Minecraft club digital citizenship questions
(1) If you post something cruel toward another person, you should:
   A. Apologize and delete if possible.
   B. Pretend it never happened.
   C. Write to the Web site to remove it.
   D. There is nothing you can do about it.

Plate 2. First tester brought into the Minecraft digital library
(2) What is a hoax Web site?
   A. A site with true educational information.
   B. A government Web site.
   C. A Web site that is trying to trick you.
   D. A social media site.

(3) If you write a report for class and use a Web site, should you credit the source?
   A. No, you do not need to credit Web sites.
   B. Yes, put the url in your bibliography.
   C. No, just write what you learned.
   D. No, just put your teacher’s name in the credits.

(4) If you find a picture online, can you put it in your school work?
   A. Yes, but you should check the copyright license if you are posting it online.
   B. Yes, you can use anything online anytime.
   C. No, because online images should ever be used by students.
   D. Yes, but only if you put your teacher’s name on it.

(5) Can you tell where a Web site is from or who wrote it?
   A. No, there is no way to tell who actually wrote a Web page.
   B. No, but Google only puts accurate things online.
   C. Yes, but only if you write to the Web site and ask about it.
   D. Yes, look under ABOUT, check the url, or use “whois.com”.

(6) Who is responsible for your digital footprints?
   A. I am responsible.
   B. My teacher is responsible.
   C. My principal is responsible.
   D. Google is responsible.

(7) I should give my password out to:
   A. Only my best friends.
   B. My classmates.
   C. Nobody (but myself and a parent if they ask).
   D. Anyone who asks.

(8) You can Skype with someone far away if:
   A. You have permission from your teacher or parent.
   B. You met them online.
   C. You know their friends.
   D. You have a good Internet connection (Plate 3).

Data analysis

Observation

Students were observed as being actively engaged throughout the project from October 2013 through April 2014. Through documenting comments and observations in a field notes file, the librarian recorded problems, troubleshooting techniques and conversations. Listening to the students in the school library, the librarian heard comments that identified understanding of elements of digital citizenship, alongside understanding the game, the programming elements and the terminology of gaming language. For example, a student quipped, “Stop trolling me!” When asked to explain, the student said, “He (Student A) keeps messing with my house!” Another student said, “No griefing!” When asked, the
student explained, “He (Student B) just built hundreds of blocks on top of mine without asking”. The terms trolling and griefing are common with gamers, and correct use of the terms by the fifth-grade students inferred background knowledge outside of school. Ground rules for trolling and griefing were discussed with the librarian, and the students agreed that the after-school technology club (Minecraft club) was serious gaming with an educational purpose.

Several weeks into the project, an incident occurred. One student (Student C) was granted permission to build large sets of blocks at a time to help create the virtual library instead of slowly building one block at a time. He accidentally moved someone else’s section of blocks and was accused of griefing. After talking it over, both students (Student C and Student D) apologized and went to work fixing the area.

After the first month, a critical problem was encountered. The librarian’s laptop, which housed the server and all of the building done by the students, crashed and the entire project was lost. The students had initially decided to build a castle and had nearly finished a huge building, including a mote, along with a start on several digital citizenship questions. The motherboard of the malfunctioning laptop had to be replaced and the “build” (everything the students had built) was not recovered. Although the students were disappointed, they went to work recreating a new project and decided to make it a virtual library similar to their own school library – complete with a loft. The students often chose to work on the project in the library loft of their physical school library, carefully carrying laptops up the steps. One student said, “It’s okay. Now we know what we are doing. It’s going to be even better”.

Student motivation was measured through observation and documented in the field notes. For example, the Minecraft club was scheduled to meet on Friday afternoons after school; however, students asked to meet during recess, lunch period or after school on other days 32 times, which illustrates the students’ high level of motivation. On several occasions, Minecraft club members, working on the project outside of the regular meeting time, were asked to leave the library because of another event, such
as a faculty meeting or baby shower and (although courteous) signs of
disappointment were obvious.

As the Minecraft club developed into a game design team, natural abilities, skill
levels and interests led students toward roles. For example, one student showed strong
leadership skills (to the point of being called bossy at times) and took on the role of
game designer. Another student had strong skills in creating redstone, the building
block used for programming items to activate movement in the virtual world game,
simulating electricity. This student’s role became game electrician or programmer.
All of the students displayed interest in building, but two in particular expressed
wanting to be called “builders”. Two students took on the role of writing questions,
based on the digital citizenship resources from the American Library Association
(2007) and commonsensemedia.org (Common Sense Media, 2014). Through helping
and encouraging others, one student became the project manager. The final role,
computer technician, evolved as a particular student began fixing mistakes or
troubleshooting technical issues.

Observation of the students, as documented in the field notes, provided evidence of
student understanding of digital citizenship, engagement in deep learning, collaboration
as a team and development of game design and programming skills.

Interviews

Interviews took place during the last month of the project. The fifth-grade students were
asked to choose a younger student to “test” the game. Each chose a third- or fourth-grade
student and asked the following questions of the game testers:

Q1. Did you learn anything from our game?
Q2. How did you feel about testing for us?
Q3. Did anyone from the Minecraft club help you in any way?
Q4. What was your favorite part of the game?
Q5. Would you or your friends want to play this game?

Answers to the interview questions, asked by the Minecraft club team members, are
shown below:

Q1. Did you learn anything from our game?
Yes, I learned about saying where you got information from on the Internet.
Yes, what a hoax is.
Yes, I learned not to believe everything I find out online.
Yes, to tell my parents what Web sites I go to.
I learned to say nice things and to not post pictures without asking.
Yes, digital footprints are where you go and put things online.
What I learned is that you can tell who wrote a Web site.
Yes, I learned a lot about digital citizenship like not giving out passwords.

Q2. How did you feel about testing for us?
I felt great! I liked exploring the cool places they built.
I felt nervous at first but then once I got to do stuff with all of them, I didn’t feel nervous anymore.

I was happy because I liked it – especially the beam of light in the library. It looked awesome.

Good. It was fun going up in the treehouse.

I was excited to be a tester because everyone wanted to.

I felt awesome. I love Minecraft.

I was worried that I couldn’t do it but it was fun.

Really, really glad I got to try it out.

Feelings about testing the fifth-graders digital citizenship game ranged from nervousness to excitement, providing evidence of unique personal interest:

Q3. Did anyone from the Minecraft club help you in any way?
I had a few questions and got lost once so he helped me.
They helped me get through if I was stuck or I messed up or if I needed help finding things.
A little – there was a librarian in the Minecraft library and he told me how to start.
Just when I was getting started and forgot the shortcuts.
Yes and I think there should be more signs to tell you where to go!
Sometimes. I didn’t know where to go for one of the clues. The tour guide led me.
She helped me find the boat and use my mouse.
I didn’t need much help except the laptop is different than my game at home.

Feedback about help needed by the student testers led to additional signage placed inside the digital citizenship by the fifth-grade Minecraft Club team members:

Q4. What was your favorite part of the game?
My favorite part was the big library and the loft.
When I found out I got all the questions right and I got to sit on the throne with the hat.
I liked the secret hiding places and treasure chests.
The treehouse.
All of it.
I liked the beam of light in the library. The library was beautiful.
My favorite part was flipping the levers to keep going and finding clues.
Exploring all the cool places.

Feedback from the testers about favorite places and parts of the game helped them understand whether or not the game design concepts appealed to the users:

Q5. Would you or your friends want to play this game?
Yes, especially third graders.
Yes – I know they want to play it.
Yes and I want to be in the Minecraft Club next year. Can I sign up?
All of them probably.
My friends would like it.
I want to make more things for this Minecraft game.
Yes I think so.
Everyone wants to play Minecraft. It wasn’t too hard but just right.
Positive feedback from all of the testers made the game designers believe the project was successful.

Findings from the student interviews provided evidence of the project’s success, feedback for better game design and validation of grade level appropriateness.

Mixed reality videos
Documentation of the students’ work, conversations and clips from interviews were captured in mixed reality video segments, both in the physical school library and in the virtual world created by the students in Minecraft. The mixed reality videos (Hill, 2014a, 2014b) were uploaded on YouTube to archive the project. The first mixed reality video, at: http://youtu.be/BQiBtD7fD1k, begins with shots of the students at work in the school library showing the engagement level and some of the conversations taking place. Students can be heard asking each other how to build or how things work. Several students express excitement, such as stating, “I have an idea!” (at 00:20-00:25). One of the students is shown writing the digital citizenship questions to be placed inside a Minecraft book and hidden somewhere in the game (at 00:40).

The game design team

Graphic designer. The student who took on the role of lead game designer explained his first idea of the castle in the video (at 7:05) and his reaction to the disaster of the computer crash. This student was a natural leader who thought about the big idea or overarching theme of the build. Other students began to look to him and ask questions.

Electrician. Not all of the students were skilled in the use of Minecraft’s redstone; however, one boy had background knowledge and enjoyed making the levers work. His analytical personality appeared to make him a natural programmer, as shown in the video (at 10:00). The other students noted that he was good at making it happen behind the scenes and had the ability to “power and activate items”.

Project manager. In addition to background knowledge and skills, each student’s personality seemed to help define their role in the project. One student, in particular, helped others work together, solved problems and encouraged others to stay focused on the overarching theme of digital citizenship. In the video (at 10:38), he explained how the project promotes digital citizenship in a fun way – with examples like finding best sources online.

Writers. Both the girls on the team chose to write the questions, sometimes working together and sometimes alone. The idea that boys are generally more attracted to videogames is challenged by one of the girls in the video (at 8:15). An explanation of the definition of a digital citizenship environment, the purpose behind the project, is shared by one of the girls (at 8:47) and shows her understanding of the purpose.

Buildings specialist. Two of the members enjoyed building when given specific items to work on. One of the building specialists stated, “I believe that everyone has their own strengths”.

Computer technician. Troubleshooting came natural to one student who often fixed problems as needed and finalized checking things, such as lost items or clues.

Because the project was extra-curricular, some of the students chose to come in at additional times if the library was available. The students asked if they could work on building at home as well as on campus in the school library; however, they accepted the explanation that the server was housed only within the school walls.
Teamwork, in any setting, can have conflicts and the Minecraft club was no exception. Halfway through the project, one student in particular lost focus on the task and began playing on his own building project and distracting the others. Another member brought this to the librarian’s attention and the “off task” student was given a warning after a reminder about the purpose of the project. A week later, the same student continued to “do his own thing” and was distracting others by trying to get them to look at the game he was playing. The librarian removed the student from the project for two weeks. This student came to the library alone to express disappointment about being “fired” and he was assured that after the two week period, he would be given another chance to prove himself. When the two weeks ended, the student began diligently working with the team without any more incidents. The video clip (at 13:20) shows a Minecraft club member discussing resolving teamwork issues.

The second mixed reality video shares the Minecraft Testers in the school library with examples of the interview questions asked after having completed the digital citizenship game. The edited video (Hill, 2014a, 2014b) was uploaded to YouTube at http://youtu.be/pUxg1OsPZRQ. Excitement on the faces of the testers is evident as they were chosen out of many eager volunteers. The Minecraft club members created a box for interested students to use small scraps of paper, write their names and drop in for a chance to play the Minecraft Digital Citizenship Game. Over 50 names were placed in the box before the testers were chosen.

Limitations and future research
The small number of students in this case study is considered a limitation, and an ambitious roll-out of an immersive digital citizenship Minecraft project would provide a rich opportunity for research on a larger scale. A wider roll-out would require teacher training in both digital citizenship and game design, skills which are necessary for twenty-first century learning at all age levels from early childhood through adulthood. The Minecraft project group size was intentionally limited for the pilot program to allow full attention to the observation of the students. The number of testers (younger students brought in to experience the game and answer the questions) was also small as each student brought in only one tester. Future studies could further address assessment of understanding before and after the game. In future studies, virtual worlds built by students could be shared on a larger scale and additional curriculum content added. Pretests and posttests with greater numbers participating would help librarians and educators understand how students learn through game design. Future work is needed to demonstrate student understanding of digital citizenship and the impact on society.

Conclusion
Through a threefold triangulated methodology of observation, interviews and mixed reality video, findings of this study strongly point toward meeting the learning objective of this digital citizenship project. Using collaboration, critical thinking and construction of a virtual world game, the students successfully embedded digital citizenship in an immersive learning environment. Teaching elements of digital citizenship to others caused students to think deeply about the concepts. The students participating in the Minecraft club case study exemplified learning as prosumers in digital culture because they contributed content themselves as well as consumed content, illustrating constructivist theory applied to information literacy concepts. The contributed (produced) content was a
student-designed video game, and the consumed content was the digital citizenship and information literacy standards from education online sources which were accessed, evaluated and embedded into their student-led project.

Learning in global digital participatory culture requires juggling technology tools while applying knowledge and skills. The students in this case study were simultaneously learning in several modes: physical, virtual and digital. Working together to share individual skills and talents as a team, learning the skills necessary to program and build in Minecraft and critically analyzing digital citizenship and information literacy were all demonstrated by the Minecraft club members throughout the project with the librarian facilitating and guiding them.

Because students may be more familiar than teachers with videogames and virtual worlds like Minecraft, it can be difficult to design curriculum or to give students the freedom to create virtual environments. The library, in this case, worked well for providing the time and space to explore embedding information literacy elements through innovative technology.

References
Gee, J.P. (2003), What Video Games have to Teach Us About Learning and Literacy, Palgrave Macmillan, New York, NY.


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