

SECOND LIFE: A TOOL FOR TEACHING HAZARDOUS ENVIRONMENT INSPECTIONS

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Abstract

Environmental health seeks to anticipate, regulate and prevent public health effects caused by the environment humans live in. One of the major roles of a practicing environmental health professional is the inspection and evaluation of environments that affect public health. Additionally, they may have a legal responsibility to advise on and enforce public health standards within built environments.

Previously we have taught principles of environmental protection in the built environment via a number of field trips to such environments. Students are taught inspection procedures and complaint investigation procedures and they discuss legal and regulatory tools that protect public health.

The disadvantages of this method of teaching are that only premises with good public health protection measures in place allow us to visit, and in-depth investigations are not possible. From an occupational health and safety viewpoint students cannot be exposed to environments or interviews with staff that might be authentic to those experienced by practitioners. This means that in the course of their learning experience students will not be exposed to conditions where they can apply the legal, regulatory and advisory aspects of the profession.

We have built an Environmental Health village in Second Life. Second Life is a digital world where its residents create its content virtually. Students create a person (an avatar) that is able to interactively explore the virtual village and perform actions such as opening cupboards, taking photographs and talking to other avatars. We have built a sports centre that is the focus of a disease outbreak. The sports centre is the built environment suspected of harbouring *Legionella pneumophila*, the bacteria causing Legionnaires' disease, which, in the fictional scenario presented to the students, has caused a number of cases of legionellosis. The students are given information about the outbreak in the same manner that as public health practitioners, they receive information in a real *Legionella* outbreak - sequentially, with progressively more information becoming available as they undertake investigation.

We evaluated whether we had achieved the learning outcomes using questionnaires and by analyzing students work. The results indicate that students are completely engaged in the learning process and that they can readily transfer their virtual learning experience to real world investigations.

Keywords: Second Life, environmental health, hazardous environments.

1 INTRODUCTION

Environmental Health is the practice of assessing, correcting, controlling and preventing those factors in the environment that can potentially adversely affect health (WHO 1993). Environmental health students are generally taught inspection and investigation procedures with field trips to food outlets, tattoo and body piercing establishments, public swimming pools, etc. However, this is not always possible, for legal, ethical, time or safety reasons.

Second Life is a virtual world where users create the content. Second Life has potential for use in teaching, especially for teaching hazardous environment inspections, as it allows students to thoroughly investigate the environment, without being exposed to dangerous or harmful situations. Legionnaires disease is a bacterial pneumonia associated with warm water systems (cooling towers, heated pools, spas, showers). We decided to use Second Life as a tool to teach students how to carry out a disease outbreak investigation, with the scenario based on a Legionnaires disease outbreak suspected to be associated with a sports centre. The scenario was loosely based on Pearson vs.

Rizos 2008 SASC 98, a case heard by the South Australian Supreme Court relating to breaches of the *Public and Environmental Health Act 1987 (SA)* regarding conditions generally of a sports centre, as well as the levels of chlorine in the spa pool at the centre. This was important to ensure that the activity were as 'realistic' as possible.

The project was a collaboration between an environmental health lecturer from Batchelor Institute of Indigenous Education, a higher education institution delivering degrees to Aboriginal and Torres Strait Islander students, and Flinders University staff, who are delivering an environmental health graduate diploma. Evaluation of the workshop's success therefore required that we assess the cultural acceptability of the workshop to Indigenous students, particularly with respect to engaging with each other as 'characters', and the educational outcomes for both graduate and undergraduate students.

2 METHODS

2.1 Workshop development

Online meetings between the authors were held every 2-3 weeks. Initial meetings were held using Flinders University's online teaching software. Subsequent meetings were held in Second Life. Three documents ('Project plan', 'Interactions' and 'Activity description') were created which separated the work that had to be done by different members of the team. These documents were constantly updated and detailed progress as the project progressed.

A sports centre was built in Second Life that has a pool, a spa, a cooling tower and showers (all capable of harbouring the bacteria that causes Legionnaires disease). All are able to be tested for water quality parameters (pH, chlorine, etc). In addition, the sports centre has a filing cabinet with accessible maintenance records, other fitness equipment, toilets and evidence of uncleanliness, and lack of maintenance. A second building containing a microbiological laboratory and environmental health safety equipment was built.

2.2 Workshop outline

The activity follows the following format:

Students get an 'email' from the state Department of Health (DoH) indicating that there had been an increase in the number of cases of Legionnaires disease at several of the city hospitals, and that the DoH suspected the link might be the sports centre.

The students undertake the investigation and action, which involves:

- Inspecting the condition and checking maintenance log books of the spa, the swimming pool, the cooling tower and hot water systems (all manufactured water systems that are capable of harbouring *L. pneumophila*)
- Developing an understanding of how a built environment such as this is laid out, and correct management/maintenance procedures.
- Collecting water samples for microbial analysis, and performing on site tests of water quality (e.g. pH, available chlorine) using appropriate safety procedures (respiratory protection etc).
- Taking photographs and statements as evidence that may subsequently be used in legal proceedings/inquiries.
- Developing an evidence portfolio to assist the Department of Health to prosecute the Sports Centre under the Public and Environmental Health legislation.
- Acting as an expert witness in legal proceedings

Using all the collected evidence students then put together a report and make recommendations to the Minister of Health. The activity takes about two days, and students can interact with each other in the sports centre, or undertake the inspection on their own.

2.3 Workshop assessment

To assess the workshop's success, we developed 'before and after' questionnaires to determine student learning. Specifically, we wanted to assess:

- a. the technological challenges,
- b. the cultural appropriateness (especially engaging with each other as characters) and,
- most importantly, c. the learning outcomes. We also used the students' reports to gauge their degree of learning.

3 RESULTS AND DISCUSSION

Initial evidence indicates that students enjoyed the activity, and that it provided a platform that resulted in significant learning outcomes. The sample size is small, however (3 Indigenous, undergraduate students and 8 non-Indigenous postgraduate students), although the activity will be repeated this year to further assess its success.

3.1 What students liked:

- "Good medium for learning techniques when can't be done on site"
- "A great way to learn when you can't do it in real situations"
- "I am a hands on learner so it was very useful"
- "It was hands on, not just reading pages of notes"
- "It was a fun learning environment and it was good engaging with other students"
- "Allowed a more realistic experience compared to classroom approach"
- "Gaining 'virtual' real life experiences in out duties as an EHO in a disease outbreak"

3.2 What students disliked:

- "Having to stop"
- "Program was a bit hard to figure out"
- "[It was hard] moving around and between buildings and rooms"
- "Not knowing enough about the software"

3.3 What we could improve for next time:

- "Probably would have been better if had some initial training"
- "I think more time is needed to get the hang of the system and the tools on the computer"
- "Only had 3 hours to complete the tasks and needed about 1 hour to get a feel for the program"
- "If we had more time"
- "We had more time, and maybe if we did another inspection in another situation"
- "I had a little more time to get to use Second Life"
- "More time to do the study/inspection"
- "More than one case was done"

3.4 Advice for developers:

- Make sure the activity is something that couldn't be done outside Second Life
- The activity needs direction
- Develop learning outcomes – use these as the reference point
- Meet regularly during development

- Assign tasks to be completed before each meeting
- Its fun!

3.5 Conclusion

The results indicate that students are completely engaged in the Second Life learning process and that they can readily transfer their virtual learning experience to real world investigations.

REFERENCES

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