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Colloquium

My dragonfly flies upside down! Using Second Life in multimedia design to teach students programming

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Introduction

This paper describes briefly the use of Second Life (SL) in multimedia design for teaching programming to computer sciences students at Heriot-Watt University, and summarises the project's findings with regard to group work.

The module 'Multimedia Design' was taught by Dr Judy Robertson to 70 fourth-year undergraduate and MSc students in computer sciences in the School of Mathematical and Computer Sciences at Heriot-Watt University, Edinburgh. These students were from varied academic backgrounds and were of varied levels of ability. During the module they were expected to acquire appropriate 3-D building and Linden scripting skills, using SL. They were assessed by coursework only (MSc students submitted an additional essay). Each student's multimedia portfolio consisted of group work (25%), multimedia tutorial (25%), interactive individual project (25%), reflective learning log (15%) and peer review (10%).

The module's main goal was to foster students' creativity in conjunction with their technical skills. While some students voiced their concern that SL was 'not serious' enough, fun and experimentation played a great part in the learners' success. 'Learning through play requires time and courage on the part of the teachers' (Robertson & Howells, 2008). Indeed, this module required both the lecturer's courage to engage with not-yet perfected third-party software and the students' trust in the lecturer's choice.

Overview

The module was successful in terms of student learning and engagement. Most learners who voiced initial concerns over SL realised its potential for programming. As one student described it in an interview: '… for opportunities I've covered already, there are

so many, the interface and the way you're learning. It is a really good way to learn, I think'. Some students believed SL helped them develop a generic approach to learning. One said: 'Such an approach could easily apply to the learning of any programming language, new technology or likewise'.

While SL posed technical and administrative challenges, learners were motivated by being able to see their peers' work: 'The island is in a bit of a creative mess but it's nice to see how others are doing. It was probably the most strange yet entertaining lab I have had in a while'.

Methodology

I gathered and triangulated data from sources such as seven lab observations, an end-of-module questionnaire (36% response rate, 50/50 undergraduates and post-graduates), five interviews and analysis of all students' learning logs. Relevant data referred to behaviour within groups, between groups, with allocated peer reviewers, with other class members, and with SL users outwith the class. Thematic analysis (Hayes, 2000) was used to analyse the qualitative data, and I collated emerging themes under headings for further analysis. This article reports only on group work, for which Johnson, Johnson and Smith's (2007) analytical categories of promotive, oppositional and no interaction were used.

'The Good'—promotive interaction

Promotive (positive) interaction occurs when individuals encourage and facilitate each other's efforts to reach the common goal. It includes mutual help, exchange of needed resources, effective communication, mutual influence, trust and constructive management of conflict (Johnson *et al*, 2007).

Exchange of needed resources was particularly important in this module, because SL only allows a certain number of prims (basic building blocks) on any given land, thus each group had a finite amount of prims to build with.

The group that accomplished greatest coherence, while simultaneously achieving top individual project marks, did not replicate items from the analogue world but built floating giant cocktail jugs, with a Lizard Lounge cocktail bar inside, a giant interactive guitar that animated avatars (individual project), dragonflies that avatars could ride (individual project) and a platform that transported avatars between the different levels.

There is evidence of mutual help and shared resources throughout this group's work. Student G reflected: 'It was an remarkable effort what everyone did, as we agreed to split all the work among the four of us to have something we can proudly present during the Oscar event that will take place the following Monday'.

This group communicated effectively throughout the module, and Student G wrote: 'The group worked as [a] single entity during the weekend, through meetings conducted in the Second Life environment to do the required changes and add all missing bits and pieces'.

'The Bad'—oppositional interaction

Oppositional (negative) interaction occurs when individuals discourage and obstruct each other's efforts to complete tasks, achieve or produce, while they focus on their own productivity instead of the common goal, preventing anyone else from producing more than they do. This includes obstruction of each other's goal, tactics of threat and coercion, ineffective and misleading communication, distrust and striving to win in conflicts (Johnson *et al*, 2007).

Most problems within and between groups had to do with management of resources. Three groups experienced internal difficulties, to the point of deleting each other's work to free prims for their own projects. Student H wrote: 'Problem solved! I just deleted all the prims of my teammate. Continue the building of the house'.

Ineffective and misleading communication was the commonest issue. Student K wrote when starting the module: 'We designated areas for the three members of our group (nobody had seen Student J, and we decided to push ahead ourselves as we could not depend on him)'. Towards the end Student K commented: 'I am worried about how little has changed in the garden and with the building of our area. The fourth member, Student J, has still not made an effort to contact us'.

A general problem of group work is inequality of workloads and resulting distrust. Halfway, Student A complained: 'I'm now getting a little frustrated, as I'm the only person in the group to have done anything! Student B originally rezzed a few cube prims for the foundations, but these weren't aligned correctly or the correct sizes, so I had to re-do them. Student C has done nothing! I've heard Student D has quit the module, although he hasn't told us that'. This group's members could not resolve their problems. Student A reflected towards the end: 'Apart from that I've built everything else, so I'm a little overworked and disappointed by the amount of effort the others have put in'.

Some groups came into conflict with other groups that built on their land, used their prims, or altered the land itself, which required adaptation by the affected group. One said: '[o]ur neighbours also changed their terrain without consulting us, so we found ourselves in a different situation than we originally started working in. However, we were able to accommodate the changes after some terraforming'. Another group's idea encountered opposition: '[w]e quite liked the idea of mono-rail and therefore we approached few people. They liked, so we thought we'll give it a shot. So I went ahead and talked to our next door neighbours ... and after a polite question, I got a one word answer. NO! So I tried to ask why and I was sent to appropriate places. Rage that I encountered was similar to when the real life struggle with neighbours ... . It is similar

situation like having bad neighbours in real life ... it's a pity ... . Anyways, there went our mono-rail idea (reverted back to the game house)'.

'The Ugly'—no interaction

No interaction occurs when individuals act independently, without any inter-change with each other, while working to achieve their goals. Individuals focus solely on increasing their own productivity and achievement, and ignore as irrelevant the efforts of others (Johnson *et al*, 2007).

There were few documented instances of no interaction, which does not necessarily mean that this behaviour was not prevalent. One undergraduate group, which had decided to build a haunted house, did not show controversial behaviour, but the efforts of group members were ignored, resulting in an incoherent group project. There was no subsequent co-ordination of efforts and one group member did not contribute to the group's area at all.

The SL environment provided opportunities for independence within group work, thus allowing cooperative as opposed to collaborative work. Some groups chose a theme and an overall look for their area, with little interaction throughout. As one student wrote: 'We divided the tasks among each other so that everyone can work on the park at their own convenience'. This group decided to split up the project so that each member had responsibility for an area or task, resulting in a sum of parts (a park area), which was less coherent than the work of the cocktail jar group.

Conclusions

For group work in SL, the following needs became apparent during this module: coherence (individuals' work needs to gel together to form a coherent piece), a common goal and negotiation skills, if changes to plans were necessary because of internal and/or external influences. SL provided the chance for students to express themselves individually, and their group meetings in SL had an immersive dimension. SL proved to be a motivational and, at times, challenging but suitable environment to learn multimedia programming.

References

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