The Pedagogical Benefits of Remote Design Collaboration in a 3D Virtual Environment: a Case Study

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Abstract

Researchers are beginning to explore the role of digital design collaboration within multi-user 3D virtual environments. In the latest installment of an ongoing remote digital design collaboration project with the Sydney University Key Centre of Design Computing and Cognition, the University of Queensland Information Environments Program (IEP) co-coordinated an online performance of T. S. Eliot's The Cocktail Party in a 3D virtual world environment. This paper describes the process and pedagogical outcomes of early learners collaborating remotely in digital 3D media.

1. Introduction

Collaboration between the various design practices (architecture, industrial, engineering and so on) increasingly spans temporal zones and technological innovations [1, 2, 3, 4]. Traditionally this has involved the transfer of files such as email, text, video, audio, CAD, animation, VRML, and so on. Most recently researchers have been exploring the role of digital design collaboration *within* multi-user 3D virtual environments (VE) [5, 6, 7, 8]. Many key centres for collaboration research have been established around the world to investigate this emerging field (see MediaLab, Chalmers, Sweden; MIT media lab, USA; CASA, UCL, UK; MiraLab, Switzerland; HitLab, USA; Martin Centre CADLAB, UK; KCDC, Australia; IEP, Australia, and so on). To test the efficacy of the various systems developed, ongoing remote collaboration between and within design schools has proven to be an invaluable data source [5, 8, 9]. In the latest installment of an ongoing remote digital design collaboration project with the Sydney University Key Centre of Design Computing and Cognition (KCDC), the University of Queensland Information Environments Program (IEP) (Brisbane)

co-coordinated an online performance of T. S. Eliot's *The Cocktail Party* in a 3D virtual world environment (Active Worlds). Students of design from both Sydney and Brisbane were engaged in a self-directed learning exercise which focussed on using digital media to transform prior understandings about what a 3D virtual environment (VE) can be used for. This paper reports on the pedagogical outcomes of this process for the students from the Brisbane campus.

2. The Project

The remote design collaboration project fits within the broader curriculum themes of an introduction to digital technology and a design studio. The technological issues revolved around constructing, hosting, and acting in a 3D VE. The studio issues address the narratological themes of 1st, 2nd, and 3rd-person narratives and their applicability within an online 3D VE. T. S. Eliot's [10] *The Cocktail Party* was chosen because it presents complex yet accessible social interactions in a series of short acts and small spaces which were easy to reconstruct within the VE.

77 first-year Bachelor of Multi-Media students in 5 groups of 15-16 members participated at the Brisbane campus with 30 second-year Design Computing students in groups of 6 participating at the Sydney campus. The play was divided into 5 acts which coincided with Eliot's original combination of acts and scenes. Each student brought their own skills and abilities to the group collaboration where the various tasks and roles were negotiated.

3. Participant Background

Students came from diverse backgrounds – international students, interstate students, and a range of ages 17-43. For many, English was a second language. Their acculturation to digital media was

equally diverse – from extensive self-taught students, some already working in the multi-media industry coming back to 'upgrade' their qualifications, to those with little exposure to digital technology. Teams in Sydney and Brisbane were able to communicate only via email, IRC chat, and within the Active Worlds (AWs) environment. The reflections expressed in this paper were drawn from my teaching journal, conversations with students, email correspondence between collaborators, chat logs from the AWs environment, and the student's final project reports.

4. The Process

First, each group analysed the play. From this they were able to identify all the props, stage settings, actors, roles, interactions, actions and so on for the whole play and for their particular act. Second, tasks and roles were negotiated within the local group and with their remote collaborators. This involved email at first, followed by the transfer of prototype VRML props for insertion into the AWs environment.

However, little collaboration takes place without the motive of a deadline. Consistent across all groups also was the complaint that communicating via email or chat was inferior to face-to-face or telephone exchange. The fragmented nature of the medium means little detail[1] is included in communiqués, leading to further confusion. In response to the perceived 'unacceptable' variability and arbitrariness of email communication, remote partners tended instead to work alone – only updating information as a courtesy, if at all.

Despite this *lack* of collaboration, 'formal rehearsals' (when I was present) and the final performance demonstrated a concise level of collaborative understanding of the overall process. The 'phantom' audience in Sydney contributed beforehand by applying their knowledge and skills with the AW's environment[2] and during the performance by adopting an ancillary narrative role – they relayed their visual and textual interpretation of the various acts as they were performed. The pedagogical benefits of this process for the actors and their entourage was

immediate and tangible feedback in a rich learning environment, which was also of their own making.

5. The Play

Groups used their interpretations of the play to re-construct the play, in Guba & Lincoln's [11] terms, in a collaborative VE. Their interpreted re-constructions tended to include elaborate imaginary spaces which borrowed heavily from pre-conceptions about computer game settings. Scripts were prepared in advance in Word, Excel, Notepad text etc. These 'texts' were then simply cut and pasted into the chat text field of the AWs interface at the appropriate times (see figure 1).

Figure 1. Screen grab from Act 3 T. S. Eliot's *The Cocktail Party* online.

To appeal to a modern audience, contemporisation of the script was used extensively. This included SMS-style text (txt) messaging, chat jargon, and emoticons. This 'txting' was further accentuated by movement about the virtual 'stage' generating a dynamism not ordinarily experienced in a less 'structured'[3] VE encounter. At times their facility with the technology saw them 'working the audience'. In this way they were identifying the various 'layers' of reality between: each other in the lab; their agents in the Virtual World; and, the phantom audience in Sydney, who's only identification came via chat messages. Oversized props were used to exaggerate the spatial characteristics of the AWs forum – typical of computer game scaling.

6. Evaluation

Following Guba and Lincoln's [11] constructivist case-study methodology, a series of short questions

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[1] Detail is left out in the vain hope that this would speed the process along. But, as communicating via email – the most extensively used media – is asynchronous, the replies are invariably executed in between unrelated tasks which, in fact, produces its own delays of hours or even days.

[2] Brisbane participants were reliant on their Sydney partners to upload VRML props into the AWs server.

[3] A less structured VE is one where users interact without purpose, pedagogical or game-play motive.

was asked of each group proceeding the final performance. Their responses were then negotiated as a class in an iterative process until consensus was achieved on agreed meanings. The outcomes of this process indicated that:

- despite the system's fallibility, the opportunity to design virtual spaces, to communicate through text, and motion, to a captive audience, was empowering in ways traditional CAD, video, or animation does not allow. The real-time collaborative interactivity provided for instantaneous (or almost instantaneous) feedback on design moves, in Schon's sense [12] – in this case 'moves' were of a performative/gestural nature;
- the notion of collaboration, remote or otherwise, was not something that had been broached seriously in their prior education experiences. This exercise was instrumental in transforming the students' ideas about the need for, and potential rewards from, collaborating both within a team and across a time zone;
- through this process students were able to reflect on the transformative outcomes of deconstructing their prior concepts about what a VE could be used for (typically: computer games, urban simulation models, product visualisation, flight simulators, and so on). From this they constructed a new reality whereby the accepted *realisms* of a computer game are *not* necessary to communicate performative design concepts[4].

7. Conclusion

Through the vicarious experiences of the students engaged in this exercise we can construct a pedagogy that recognises the need for collaboration (both local and remote). To this end the 3D VE's used here provided a vehicle for its exploration.

8. References

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[4] Students felt that the AWs environment offered an impoverished, abstract realism when compared to the realisms of high-end computer games such as Quake, Doom, Final Fantasy and so on.

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