

Building Synchronous Voice-based 3D Learning Spaces

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Abstract

This paper introduces a project at the University of South Australia to develop purpose-built 3D online learning spaces for synchronous voice-based small group teaching and learning. Justification for the project is given in terms of existing deficiencies with 'space-less' text-based synchronous communication methods and tools. Initial survey results of a large class of students who have used a variety of synchronous tools for small group learning are presented, these show a student preference for synchronous voice over text. It is argued that this preference will increase with increasing student familiarity with synchronous voice. A project timeline is presented stating intended progress by December 2002.

Introduction

The online learning environment at the University of South Australia concentrates on asynchronous methods of delivery and interaction [1]; such as email, web documents, and voice/text-based discussion forums. The lesser synchronous component of the online environment is addressed with the provision of text-based chat, real-time video conferencing using Netmeeting, and of course, the telephone. These synchronous tools are mostly adequate for one-to-one communication, however we believe they are often less suited for small group teaching and learning as would typically occur in a face-to-face tutorial class. As a School we value the learning interactions that occur in our tutorials and would like online learners to share in these experiences. We are therefore exploring options for online equivalents that promote active learning [2]. One such option is the development of synchronous voice-based communication in purpose-built 3D online learning spaces. The intention is to create and manage an online learning environment that is conducive to small group synchronous chat.

This paper introduces a project at the School of Communication, Information, and New Media at the University of South Australia to develop purpose-built 3D online learning spaces for voice-based small group teaching and learning. This project is special in that it combines the concepts of voice and space to create online learning environments. Presented here is work in progress and there are many questions to be answered in the following months.

Voice and Space

The concept of 'space' as applied to online learning is important [3] though often overlooked. Architecture is a crucial defining feature of society and we go to great efforts to create and modify physical spaces for our real-world activities. Some spaces are clearly more conducive to certain types of talk than others. The design of physical education spaces is a common interest of staff and students. Yet, in most implementations of online teaching and learning, space is ignored.

Text, or literacy, and voice, or orality, require different forms of thinking and not interchangeable [4]. To simply substitute text for what is usually done with voice is not valid. However this is what has been commonly done with synchronous online communication, which has been dominated by text, regardless of the context or purpose. Synchronous text has a number of disadvantages and is dependent on written language skills, typing speed, and experience with the technology. While many shortcuts or abbreviations are used by experienced chatters (for example SMS messages) these must be understood by all parties and present a significant learning curve for beginners. Text chat is inherently slow when compared to spoken language. It can be argued that these real-time text-based conversations are not our natural or preferred means of communication and text chat rarely allows for productive discussion or participation and frequently disintegrates into simple one-line contributions of minimal depth' [5]. With the lifting of technical limitations perhaps voice now has a greater part to play [6].

A readily available solution to the marriage of voice and space is the Traveler software. Traveler is a server and client software system that allows multiple users to become Avatars and navigate 3D VRML worlds and conduct realistic real-time lip-synced conversations in groups. Traveler was developed in 1995 by Onlive Technologies. It was very advanced for its time and often exceeded the performance and bandwidth of the available computers. Consequently Traveler had a very small user base [7]. Today, with advances in hardware and networking, Traveler is now viable. A single Traveler server has been setup in our University and students use Traveler clients installed on either University computers or their home computers – the

whole system working seamlessly from within a web browser. Unfortunately Traveler is no longer under development. The present owners of Traveler, Digital Space Inc [http://www.digitalspace.com], are working with Adobe on their new Atmosphere product (3D world builder) [http://www.adobe.com/products/atmosphere/] and the future looks promising for a successor to Traveler in the near future.

Traveler allows users to move into different spaces (moving to different 3D worlds) and to easily move to form differing groups that make some physical sense. Traveler worlds can be created using 3D modeling software that outputs VRML (Virtual Reality Modeling Language). Most Traveler worlds have been created for their aesthetic or entertainment value and while it is possible to hold classes in an underground cavern, or Bar, or on the moon (and we are presently doing this). These spaces may serve as a distraction and are unrelated to the task. What we are exploring is the creation of purpose-built educational VRML spaces. How these will look will depend on what activities we want to occur in these spaces. For example, we may want a space that has a central meeting place with clearly identifiable breakout spaces that can be easily visited by the tutor. We may want to give access to certain online resources in certain positions in certain spaces and so on.

Initial Survey Results

600 students from the course "Computers, Communication, and Society", an introductory course in electronic communication, used a variety of synchronous and asynchronous online tools to complete group related tasks over a 10 week period. Synchronous tools used were: a web-based Java text chat system; The Palace - a 2D Avatar and text chat system, Netmeeting – a video conferencing system (one-to-one in our implementation), and Traveler – a 3D lip sync voice based Avatar system.

As part of the evaluation of the course, students were asked which method of synchronous communication they preferred for small group work. 19% preferred Netmeeting, 38% text chat, 33% Traveler, and 10% The Palace. Overall, 71% preferred synchronous voice over synchronous text. Those who chose synchronous text stated that familiarity with the technology was the most significant factor in their preference for text while those who chose synchronous voice commonly referred to the 'efficiency' and 'naturalness' of voice.

Ongoing research into asynchronous text vs voice conducted with the same course [8] suggests that students may change their preference for asynchronous text-based discussion given sufficient practice and success with voice. This trend may also be evident with synchronous text vs voice and further practice with synchronous voice (in the context of Traveler) has been scheduled for the remainder of the

semester. Later evaluations will possibly show a swing to voice as a consequence. We believe that there is sufficient evidence from these early indicators to continue our project.

Timeline

Our current task is to clearly define the anticipated activities that will occur in these 3D spaces. Concurrently we are developing expertise in building 3D worlds and Avatars. Next we will build a range of spaces that can be trialed with our students. Based on results of staff and student surveys and interviews we intend to build a final set of rooms that can be made available to the wider university.

In December we will be in a position to report on the process of building, testing, and evaluating these spaces. We will be able to demonstrate and discuss the application of purpose-built 3D educational spaces with synchronous voice as a part of our University online learning environment.

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