

Networked Virtual Environments as a Communication Tool for Distance Learning

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- This paper describes an ongoing PhD research project at Leeds Metropolitan University. It investigates the usability and potential benefits of Networked Virtual Environments as tools for communication and collaboration in Distance Learning systems.

The project explores the interface aspects of a system conducting the virtual counterpart of face-to-face communication with regard to user representation, change of representation and perception of the interlocutor within a virtual world. As part of the research, a prototype three-dimensional, multi-user environment will be created supporting computer-mediated verbal communication as well as non-verbal communication based on the use of visual metaphors in the virtual world. Furthermore, the

research will consider opportunities for effective group work in a virtual study room, based on discussion and discourse.

Introduction

- The term Distance Learning refers to an educational discipline that has its roots in the last century. Traditionally, Distance Learning packages are designed to enable the learner to work through the material with far less guiding help from a tutor than normally. Influenced by this view, computer applications in Distance Learning have primarily concentrated on supporting the individual and isolated learner, leaving aside tasks like guidance by a tutor and collaboration between peer students (Garrison 1993). However, the significance of interaction for the purpose of mutual reflection, motivation and stimulation as well as assessment and control of progress has been widely accepted (Laurillard 1993, Moore 1993).

This research project aims to provide a sophisticated discursive medium, integrated in a comprehensive learning environment. It is intended to support both an effective form of quasi face-to-face communication and means for collaboration, accessible over long distances via the World Wide Web. Spatially separated learners will be able to work together in a virtual space, exchanging ideas and resources and discussing their educational concerns with, and seek advice from, a tutor.

Collaboration on the World Wide Web

- The World Wide Web is considered to change the face of the Distance Learning discipline fundamentally. It embodies a convergence of the previously separate technologies and industries of computing, telecommunications and television (Bates 1995). Its potential collaborative features offer greater interaction between learners and tutors, enabling them to overcome the spatial distance and work together more efficiently (Hobbs and Taylor 1996).

Networked Virtual Environments (NVEs) use distributed virtual reality systems to support collaboration between groups of people. The participants are virtually in the same shared virtual world and can interact with it. Each one is represented by a so-called avatar, a shape with identifying attributes (Broll 1996). Since each user perceives the avatar representations of all other participants and discerns their movements and behaviour, NVEs can offer a high level of mutual awareness.

A New Approach to Distance Learning

- In this research, NVE technology will be used to develop a prototype Integrated Learning Environment (ILE) that enables interaction with both persons and information resources within the virtual world. The main focus of research will be the applicability of this technology as a communication medium, supporting verbal as well as non-verbal communication, and its possible benefits for Distance Learning systems.

The intended approach and particularly the introduction of non-verbal means of expression raises several questions concerning the feasibility of reproducing face-to-face communication effectively in a virtual environment:

when is it beneficial to model the real world human interaction and when would the use of metaphors for the representation of gestures be preferable? what are appropriate group communication protocols for a virtual world and how can these be supported by the interface? how can learning resources be effectively integrated into the environment?

In a series of experiments, the technological and psychological limits of modelled face-to-face communication will be investigated.

Expected Research Outcomes

- It is expected that a major finding of the evaluation will be to what degree features such as gestures, facial expressions or movement of lips have to be either modelled or replaced by interface metaphors to create an atmosphere resembling face-to-face communication.

The comparison of different approaches to conducting and controlling group discussions is expected to lead to the formulation of interface guidelines for effective discussion and discourse in a virtual world.

References

1. Bates, A.W. (1995) *The Future of Learning*, Online Document <http://courses.cstudies.ubc.ca/learning>
2. Broll, W. (1996) *Extending VRML to Support Collaborative Virtual Environments*, in *Proceedings of CVE'96*, Nottingham University
3. Garrison, R. (1993) *Quality and access in distance education*, in *Theoretical Principles of Distance Education*, Desmond Keegan (Ed.), New York, Routledge
4. Hobbs, D.J., Taylor, R.J. (1996) *The Impact on Education of the World Wide Web*, in *Proceedings of WebNet 96*, San Francisco
5. Laurillard, D. (1993) *Rethinking University Teaching*, London, Routledge
6. Moore, M.G. (1993) *Theory of Transactional Distance*, in *Theoretical Principals of Distance Education*, Desmond Keegan (Ed.), New York, Routledge