Interactive Virtual Whiteboard for Collaboration Learning

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Chandee, S. and Suksakulchai, S. King Mongkut's University of Technology, Thailand. Interactive Virtual *Whiteboard for Collaboration* Learning

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ABSTRACT

The purpose of this research is to develop an interactive virtual whiteboard for collaboration learning (IVWCL). This will allow learners in different places to do activities together through the Internet at the same time. Suppose students from different places are assigned to work on an assignment, they need a way to communicate with each other effectively. Although they can use Web boards or Chat systems as their communication tools, it is difficult for them to understand the details clearly by means of typing, which is different from illustration or drawing. The present problem of using illustration method over the Internet is that the discussed images or pictures have to be saved before everybody can see them. If one person draws a line to depict details, the other party have to login at the same time in order to see the drawing lines. Therefore, it is difficult for the ones who join the discussion and presentation at a later time to understand what details of presentation have been discussed and presented. This is because they will not be able to see the pictures and drawing lines in sequential order. Therefore, the IVWCL system must have the capacity of relaying drawings made by a party to others and saving each drawing stroke including pictures loaded in a central database which can be drawn and loaded afterward. In this way, if someone else joins the conversation later, they can follow the discussion by watching each line redrawn and images reloaded in orderly sequence as if they are in the beginning of the discussion. After they can catch up the discussion, they may give their opinion to the counterparts via the proposed system if they want to. The test was performed successfully allowing one teacher and two students, logging in from three different locations, to discuss about writing Dataflow Diagram of the Enrolled Registration System.

Keywords: Interactive Virtual Whiteboard /Collaborative learning/Video – Conference/ Dataflow Diagram

INTRODUCTION

Team learning, sharing opinion, and supporting each other can give learners opportunities to develop their skills in learning. This would make learning complete and more effective (Spears 1992, Wood 1992 and Johnson 1996). When a learner is assigned to a piece of work and has to do in groups, they will be more motivated. There will also be a progress in thinking with fewer competitions among them. Differences between peers will be accepted and more personal skills can be shown, making them depend less on instructors. Collaboration learning may give learners more skills in learning and is considered the best instruction (Chapman 1991, Fontenot 1995, Holiday 1995 and Samphan 2003)

At present, because of the advance in information technology, e-Learning has been widely applied for instruction. Therefore, it would be great if we could apply the technology with collaboration learning. This may solve a problem of establishing a collaboration learning that learners must be together at the same place or nearby to work together. However, there is a challenge to apply the

technology to the collaboration learning. The problem is that everybody in the group must login to the virtual meeting before the meeting begins otherwise they may not get connected at a later time or may miss some information. The software at the present time cannot solve this problem, e.g. Net Meeting, Skype etc. Therefore, the objective of this work is to develop a system that supports or solves this problem so that collaboration learning through the Internet could be done seamlessly.

OBJECTIVE

To develop an interactive virtual whiteboard for collaboration learning (IVWCL)

THE APPROACH

To develop a system that supports collaboration learning and allows a meeting in which there is no need for everybody to be in the meeting at the same time and to achieve the objective, the system must be worked in a client-server manner. The server will collect the information processed during the meeting as a database and the data will be sent to all clients in the meeting and clients which have just logged in at a later time.
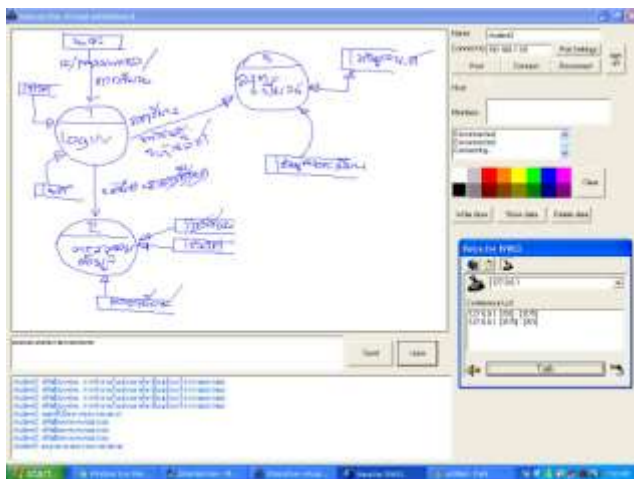
The principle of the proposed system is as follows: when a computer starts a meeting and acts as a server, the meeting will have at least one client. The server will record the meeting information in a database. If any other clients log in at a later time, they will be given the past information in the meeting on their display window, in other words, the data which have been discussed. The system developed for this study was aimed to focus on the interactive virtual whiteboard and how data written on the whiteboard could be retrieved for a later time to clients. The proposed system has 3 components:

a) Network connectivity
b) Operation of the interactive virtual whiteboard
c) Asynchronous and synchronous data transfer

Figure 1: Basic Idea of the Distance Collaboration System

Network connectivity is done through the Internet in a client-server manner. All computers which have connected to the server could have an operation in an interactive way with each online computer using the interactive virtual whiteboard system as a tool for collaboration learning. When learners have logged in to the network, they could discuss and express their opinions through IVWCL system by writing and drawing on the IVWCL system. The system will store the data in a database automatically and when learners who have logged in after the meeting has started, they should be able to access to the previous discussion in order to catch up with the topics discussed and give their ideas if they need to.

AN INTERACTIVE VIRTUAL WHITEBOARD

Figure 2 shows the window of IVWCL system. The figure shown here is a drawing area of the interactive virtual whiteboard which all learners can write or draw anything on it and the system will store the data to the system database. The learners who come later when other learners have discussed could access to the previous data in the database.

Figure 2: Interactive Virtual Whiteboard System

EXPERIMENTAL RESULTS

To test the system, three fourth-year undergraduate students majoring in Information System at the Faculty of Business Administration , Rajamangala University of Technology, Rattanakosin Salaya campus were assigned to work together in the topic of drawing a dataflow diagram related to the student registration of Rajamangala University of Technology, Rattanakosin Salaya campus. It was found that the computers could be used in the network effectively. The test revealed that the system could show the data which have been discussed before to the late comers accurately. Thus, the learners knew what have been discussed and understood as well as could follow the meeting along with expressing their opinions in accordance with the contents at the moment. Figure 4 shows the display of computers during the meeting, both server and all clients. Figure 5 shows a learner using IVWCL system.

(a) Host's Screen

(b) Members' s Screen

Figure 4: Comparison between a Host's Screen and Members' s Screen

Figure 5 : A Learner using the IVWCL System

CONCLUSION

The system test was done and it fulfilled the objective, especially when a learner came late in the meeting. This system used one server and two clients. However, the system could work with more computers according to the performance of the server computer and network connectivity for the meeting. The strokes from writing and drawing could be stored as a Text File format which could be retrieved in the future by learners.

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