Online Operation Guidance of Computer System Used in Real-Time Distance Education Environment

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ABSTRACT

Computer system is useful for improving real time and interactive distance education activities. Especially in the case that a large number of students participate in one distance lecture together and every student uses their own computer to share teaching materials or control discussions over the virtual classrooms. The problem is that within this type of education environment the students need to learn the operation of the support system which runs on their own computers. It is important that the system can support the students to learn the system. This paper proposes a support system for the online operation guidance of computer system in real time and the interactive distance education environment, RIDEE-OOG. The features of this system are: (1) a built-in function in the original distance education support system, (2) it is easily used by the teacher in real time distance lectures, and (3) it does not burden the students. This paper reports RIDEE-OOG’s basic design issues and implementation. The effectiveness of this proposal has been confirmed by experiments.

Keywords: Computer System, Distance Education, Operation Guidance, Real-Time and Interactive, RIDEE-OOG

INTRODUCTION

The remarkable advancement of information technology such as high-speed and broadband network and high cost-performance computer, has made it possible for people to communicate by not only text but also still images, audio and video. Personal computer (PC) and portable communication devices are widely used in today’s educational activities. For example, even in a face-to-face lecture, the teacher and students are allowed to use their own computers at classroom (Liu, 2003; Anderson, 2004; Healy Beauvois, 2008). High-speed and broadband networking technology has offered a new environment for real time and interactive distance educational activities. The early style of real time distance educational environment were simple utilizations of video conference systems, by which small groups of people shared their video and presentation materials between two sites (Alexander et al., 1999; Cadiz et al.. 2000; Carvalho, 2000). And then, various real time distance educational activity support system

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were proposed mainly for efficiently sharing video and presentation materials over remote sites (Chen, 2004; Deshpande & Hwang, 2001; Yuze, 2005; Bower, 2006, 2007; Adobe, 2010). Moreover, with handheld, pervasive and wireless tautology, it became possible for all the participants to connect their own computers or portable communication devices to the support system of real time and interactive distance classes (Bonakdarian, 2009). This may be the ultimate style of real time distance education hardware environment with high extendibility in system function and scale. For example, by those computers, it is easy to exchange instant messages between participants or performing floor control in real-time discussion between people in different remote sites (Shi et al., 2003; He, Zhang, & Cheng, 2004; Koppelman, 2008).

When the students at a real time distance lecture are allowed to connect their own computers to the support system for improving the lecture’s efficiency, they then must be required to know how to use this system through the user interface on their computers. However, as the support system became multi-functional, it may become complicate. So it will take more time for introducing students a new support system even the system’s user interface is very friendly. A study in Japan shows that most questions from remote students are about the operation of the computer-aided education support system itself (Kakuda, 2006). Therefore, there should be design issues about the operation of the support system such as: (a) At the beginning, how to quickly introduce the system to the students? (b) How to instruct the students in the system operation while the distance educational activity is ongoing? and (c) How to check that the students have finished an expected operation of the support system?

Documents such as user manuals filled with pictures or animations of user interface’s screen shorts can only be a solution for the above mentioned issue (a). It is inefficient to use them in a real time distance classroom because the students have no time to read them during the class. Using additional system operation instructors in the student site can be a solution for all the above mentioned issues since the instructors know the support system completely well and can help the students. But this will increase the running cost of distance education, especially in the case that a lot of students join the same distance class in scattered remote sites. On the other hand, without additional instructors in the remote site, it is very difficult for the teacher to guide the students in computer system operation only by relying the communication by sharing video and presentation materials at the virtual classroom.

Another solution for the above-mentioned issues is to operate student computers directly from remote site. The remote desktop function of Microsoft Windows operating system (Microsoft Cooperation, 2010) or VNC (RealVNC, 2008) can be used as rescue tools for performing computer remote control in the experiments of real time distance educational activities (He, 2002a). But those techniques can not be used in the case that the student computers do not have enough CUP power to run a remote control server or the students do not have enough knowledge to change their computer’s software configuration for setting up the remote control function, or the students do not want to open their private information on their computers to their teacher since remote control function will give the teacher a full permission to operate student’s computers. Another problem in those techniques is that they only support one-to-one remote control, and can not be used for guiding more students at the same time. As an ultimate user interface style, the Second Life (SecondLife, 2008) may be helpful to teach computer system operation over networks and is already used in real time distance education (Ritzema & Harris, 2008). But it is difficult to use this to explain the operation of the distance education support system itself.

So far, in all researches on real-time distance education support system, there is a assumption that the users of the support system have already known the system very well before they attend the virtual classroom. And we have not found such research that focus on
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