Quiz Making Activities Using the Multi-Mouse Quiz System in an Elementary School

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ABSTRACT

The Multi-Mouse Quiz System is an application used to treat quizzes in a classroom or other learning environment. The system comprises the Multi Mouse Quiz (MMQ) and MMQEditor. The MMQ is an application of Single Display Groupware (SDG), which enables multiple users to answer quizzes by connecting several mice to an ordinary computer. The MMQEditor is a personal computers (PCs) application designed to edit quizzes for MMQ. In this paper, the authors describe the activities of using MMQ and MMQEditor in an elementary school. Sixth grade children were asked to design quizzes using MMQEditor and then evaluate them mutually using MMQ. The results of the activities showed that the combination of MMQEditor and MMQ helped engage the children in the activities, the children easily operated MMQEditor, and learning was encouraged and deepened through the mutual evaluation of created quizzes.

Keywords: Answering Quizzes, Creation of Quizzes, Elementary School, Face-To-Face Collaborative Learning, Single Display Groupware

INTRODUCTION

Most of the current Information and Communication Technology (ICT) systems for education purposes are based on the use of personal computers (PCs). Therefore, the ICT systems are supposed to support collaborative learning by connecting PCs to a network, with students having their own seats and computers in the classroom. When students want to discuss

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their work with their classmates, they have to move to seats and leave their own computer. Considering the importance of face-to-face collaborative learning, such an inconvenience is a disadvantage to education in elementary schools. In other words, making each child use their own computer may inhibit some important aspects in the collaborative process, such as the development of mutual understanding through face-to-face discussions and sharing information in a virtual workspace.

The shared use of one display with multiple users having separate input devices is an interesting concept for supporting face-to-face collaborative learning through computing. This concept was termed Single Display Groupware (SDG) by Stewart et al. (1999). The Multi-Mouse Quiz system developed by Saga et al. (2009) is a concrete application of SDG. The system comprises the Multi Mouse Quiz (MMQ) and MMQEditor. MMQ enables multiple users to answer quizzes by connecting several mice to an ordinary PC. We previously conducted four experiments in social studies classes through collaboration with two elementary schools. The results showed that most of the children were motivated to learn and their communication when answering quizzes was encouraged with use of the MMQ (Zhou & Kita, 2011a). Furthermore, these practices also showed that the MMQ System could be operated by the schoolteachers with minimal assistance from researchers. During these experiments, there was a request to allow children to create quizzes themselves so as to engage them more in the learning process with the MMQ. In fact, one teacher implemented a class plan by asking children to design quizzes. However, in this class, children wrote quizzes on paper, while the teacher later collected and reviewed them before entering them into the MMQ system.

This paper describes another activity using the MMQ System in an elementary school. In this case, children were asked to create quizzes by themselves using the MMQEditor, and then assess the quizzes of other children using the MMQ.

**RELATED STUDIES**

The desire to develop technologies that enhance the richness of collaboration in a face-to-face environment has spurred researchers to investigate a variety of multi-user systems. The SDG model proposed by Stewart et al. involves systems in which users each have an input device, such as a mouse, that shares information on a single display. Scott et al. (2003) reported that the SDG environment led to users being more active on the screen. The SDG Toolkit is a middleware tool that provides multiple users with an interaction environment using multiple mice and keyboards handled independently (Tse et al., 2002). The system known as Mischief and proposed by Moraveji et al. supports traditional classroom practices between a remote instructor and a group of collocated students using SDG (Moraveji et al, 2008, 2009). While most research on SDG assumes a small number of interacting users, attempts are made for all students in a class to use their own mice. Based on their research, Microsoft also released middleware for SDG and a plug-in for PowerPoint.

The authors of this paper have focused on the application of SDG in the field of education. A drawing tool was developed by Hagiwara et al. (2007). A quiz system developed by Saga et al. (2009) was later improved by Zhou et al. (2011b) for use in elementary schools. We have also promoted the development of a brainstorming tool (Mori et al., 2012). This research showed that the SDG environment leads to higher user engagement and a positive impact on collaboration and motivation.

While quizzes are a common tool for learning and teaching, their use in collaborative learning has recently attracted attention, and in colleges in particular, there are many different
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