

Students' Competitive Preferences on Multiple Mice Classroom Interactive Environment

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Abstract: In this study, a competitive multiple mice classroom learning environment is designed to afford the students' classroom information technology accessibility and to provide a social interaction platform for the teachers and students. One hundred and one 8th grade students from three classes participated in the pilot study with the English vocabulary memorizing subject. All the students interacted with their peers on the large shared display moving their mouse simultaneously. Two competitive modes, individual task competition and group rush competition, were implemented. The results indicate the system usability is acceptable and the classroom atmosphere changed dramatically through competition.

Keywords: Multiple mice game, classroom face-to-face learning activity

Introduction

Information technology is widely used in classroom [1]. Integrating social activities into learning environment is an important issue in designing technology enhanced learning system [2]. Traditionally, the classroom is equipped with computer, keyboard, and mouse. However, kids have their unique requirements in using digital learning devices in classroom [3]. Some novel tools are needed to meet the need. So human-computer interaction researchers have been trying and much supporting for the development of multiple mice design of which a computer can equipped with many mice [4]. In this study, a multi-mouse supported classroom is established in which a computer is equipped with more than ten mice and the students can interact with their peers on the large shared display simultaneously. We urge that letting students use the multiple mice interaction system with peers can break the isolated learning scenario, attract students' attention, encourage group work, and improve students' interaction [5]. Moreover, to facilitate students in performing the multiple mice social interaction environment, two competitive activities, individual task competition and group rush competition, were implemented. A pilot study was applied and reported.

1. MMC: Multiple Mice Classroom System

MMC is a system that allows the teachers to use a computer with several mice (more than ten mice). Each student can have at least one mouse which can provide the student with the minimal information technology accessibility. Two competition modes have been implemented to facilitate the students' interactions. Two major functions, individual task competition and group rush competition, of the MMC are elaborated below:

- Individual Task Competition Mode

In the individual competition mode, each student assigned to a personal zone does the exercise proposed by the computer individually (shown as Figure 1-a).

- **Group Rush Competition Mode**

All the students answer the same question proposed by the computer (shown as Figure 1-b). There are several options in this mode such as the competing for the one which is the most competitive, the eight competing for two, the one-second competition which is the less competitive.

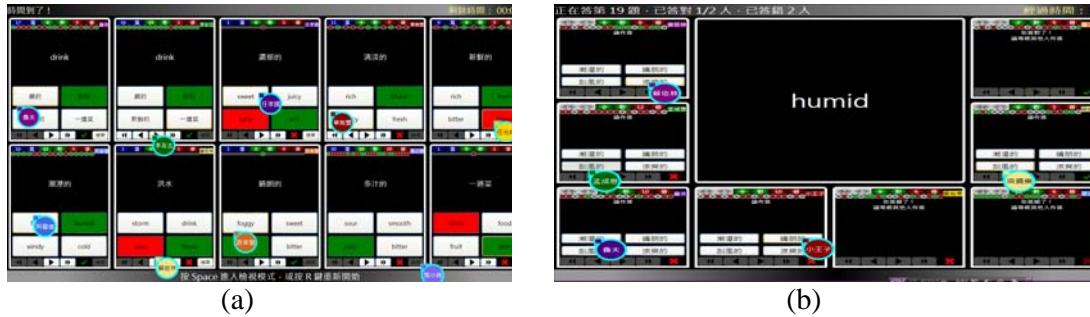


Figure 1: Individual Task Competition and Group Rush Competition Modes

2. Preliminary Evaluation

One hundred and one 8th grade students participated in the pilot study. Sixty-five are female, and thirty-six are male. One of them was refuse to participate in this activity, and the other two were absent from the class. Two modes, individual task competition and group rush competition, were proceeded to examine students' competitive preferences.

2.1 Questionnaire Study

A five-point Likert item questionnaire was applied. Eleven of the copies were extreme data and excluded. Six failed to record. Eighty-four copies are analyzed as below (shown as Table 1). Each item of the questionnaire was transformed into numbers. Strongly agree was coded as 5 and strongly disagree was coded as 1.

According to the statistics, 3.36 students expressed that they like the English course, but 3.22 students said that they would like to spend time on memorizing vocabularies (shown as Item 1 & 2). The willingness of learning is not high. With MMC, the motivation of learning vocabularies was promoted to 3.68 and 3.79 students had fun in having MMC learning activity (Item 3 & 4). Dramatically, 69.0% of the students showed their willingness to learn better if they have more time (Item 5). Furthermore, more than half of the students like the feeling of competition (Item 6) though there are some different preferences. From Item 8 to 10, we learn that 47.6% students felt more relax in the mode of one-second competition. However, 41.6% students were also interested in competing for the one. Only one-third of students wanted to play the mode of eight competing for two again.

Table 1: Statistics of the Students' Preference on MMC

Item	Strongly agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)	Ave.	SD
1. I like learning English.	17.9	26.2	36.9	9.5	8.3	3.36	1.14
2. I am willing to spend time memorizing vocabularies.	13.1	28.6	33.3	13.1	11.9	3.18	1.18
3. I like to learn vocabularies with my classmates by MMC.	27.4	28.6	33.3	6	4.8	3.68	1.09
4. It is interesting that many people use multiple mice together.	27.4	36.9	27.4	3.6	4.8	3.79	1.04

5. I hope more people can use MMC to have activities together.	33.3	22.6	34.5	4.8	4.8	3.8	1.12
6. If I have enough time, I think I can do much better.	22.6	46.4	19	4.8	6	3.76	1.05
7. I like the feeling of competition.	29.8	22.6	31	9.5	4.8	3.65	1.16
8. I feel more relax in the mode of one-second competition.	19	28.6	39.3	10.7	2.4	3.51	1
9. Eight competing for two makes me want to play again.	15.5	17.9	47.6	13.1	6	3.24	1.06
10. Competing for the one is the most interesting and exciting.	21.4	20.2	40.5	8.3	9.5	3.36	1.2

2.2 Learning Achievement Study

To study the learning achievement of the students, a pretest and posttest of the thirty English vocabularies including thirty adjectives were applied. The numbers represents how many correct answers the students made. Only Class B's achievement is significant, but three class members all learned from the activity according to the average of the posttest. Without teaching, the students can learn with peers in MMC environment, too.

Table 2: Students' Vocabularies Learning Achievement in Pretest and Posttest Scores

	Pretest		Posttest		Sig.
	M	SD	M	SD	
Class A	16.0	7.89	17.7	9.64	.14
Class B	19.2	7.96	21.3	8.80	.00
Class C	18.7	7.20	19.0	7.30	.67

3. Discussion and Conclusion

This study reports a multiple mice classroom (MMC) system in which a computer can connect with more than ten mice. All the students can interact with their peers on the large shared display with their own mice simultaneously. We will argue that can break the isolated individual learning and attract the students' attention, encourage the group works, and improve the classroom atmosphere. A pilot study has been applied to study the usability and sociability of the system. The result indicates that the students like to learn with peers with MMC in spite of different competitive preferences. Maybe what the students like is not what they really want. Concerning about the learning achievement, the significance may be promoted with better instructional design and technology support. More detailed study is needed in the future.

References

- [1] Roschelle, J., Penuel, B., & Abrahamson, L. (2004). The networked classroom, *Educational Leadership*, 61, 50-54.
- [2] Chang, L. J., Yang, J. C., Yu F. Y., & Chan, T. W. (2003). Development and evaluation of multiple competitive activities in a synchronous quiz game system, *Journal of Innovations in Education and Training International*, 40(1), 2003, 16-26.
- [3] Plowman, L., & Stephen, C. (2003). A 'benign addition'? Research on ICT and pre-school children. *Journal of Computer Assisted Learning*, 19, pp. 149-164.
- [4] Moraveji, N., Kim, T., Pawar, U. (2007). A mouse on each desk: An inexpensive classroom interaction technique for remote teaching, Microsoft Research Technical Report, Redmond, WA.
- [5] Chang, B., and Lin, Y. S. (2009). Enhancement of mobile learning using wireless sensor network, *IEEE Learning Technology Newsletter*, 11(1, 2), 22-25.