Correlation between Location of Remote Scene and Collaborators' Behaviors

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INTRODUCTION

Distance learning has reduced many issues related to traditional teaching and the development of this area will no doubt provide benefits to many parties in a variety of aspects. One of the biggest limitations of distance learning is the ability to successfully merge two distant classes into one. Our research aims to understand the relationships between user behaviors and tools to provide a guideline of classroom settings.

In this paper, we focused on the location of screen that shows the image of remote collaborators. The results gave us a better understanding on how the location of the remote scene affects collaborators physically and emotionally.

In a controlled experiment, we specifically measured how long it took for presenters to notice movements of remote students in 4 different screen locations, front, back, right and left of the classroom. We also recorded the physical and mental aspects of students' and teacher' behaviors in the different locations of the remote scene by observations, questionnaires and interviews. We wanted to find out which configuration is best suitable for all collaborators; lecturer, collocated students and remote students in distance learning.

METHODOLOGY

Participants

•7 post-graduate students in their 20s-50s were divided into groups of 3 and 4.

•There were 3 males and 4 females

• All participants had not had experience with distance learning environment.

Design

•A within-subjects design was employed, with 4 configurations of the location of remote scene; front, back, right and left of the classroom.

•Each participant completed all 4 types of configurations and rotated their roles as Lecturer (Presenter), collocated student (Listener 1) and remote student (Listener 2) for each configuration.

•The experiment used conference system ConferenceXP to support the distance learning environment.

Procedure

•Participants were given a brief introduction of the study and the equipment being used.

•Each participant needed to prepare a 10-30 mins long PowerPoint presentation to present.

•In each experiment, one participant presents his/her presentation while another participant listens to him/her in the same room, The third participant sits in a different room, as Listener 2.

•Both listeners were told to maintain a good interactions with the presenter.

•Listener 2 was told to raise their hands when they have any questions/comments and wait until they are acknowledged.

- Once all four experiment conditions were completed, participants were given a survey, followed by an interview.

Analyses

- Observations on the recorded videos, survey and interviews were carried out to analyze the data in the experiments.

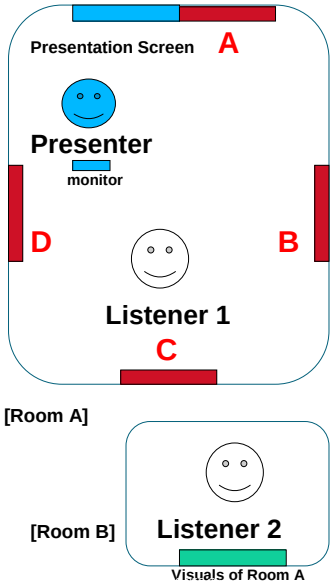

Figure 1. Experiment environment of collaborators in a distance learning atmosphere

Room Configuration

- 50-inced plasma display that showed the remote scene was rotated into locations A, B, C and D.
- Presenter stands at the front of the class with a monitor in front of him and a presentation screen behind him , both showing the presentation slides.
- Listener 1 sits in the middle of the room and Listener 2 sits in a separate room.

RESULTS

EXPERIMENT

Table 1 shows the average time (sec) taken by each presenter to notice hand movements of remote students.

Presenter	A	B	c	D
1	1.0	1.0	1.2	1.7
2	3.0	2.3	5.0	3.8
*3	3.6	11.0	40.5	15.5
4	6.9	1.4	1.0	3.8
5	1.0	1.8	1.5	2.1
6	1.5	1.7	2.0	2.0
7	1.0	1.5	2.0	4.0

Table 1. Time presenter took to notice remote actions

Presenter 3 had a low presentation skill and did not connect with remote and collocated students was considered as uncommon as a lecturer. Therefore, we present both results of with and without the data of presenter 3. Table 2 shows the average time (sec) taken by all presenters in conditions A, B, C and D;

	A	B	C	D
Average time with Presenter 3	2.6	3.0	7.6	4.7
Average time without presenter 3	**2.4**	**1.6**	**2.1**	**2.9**

Table 2. Average time presenters took to notice remote actions

QUESTIONNAIRE

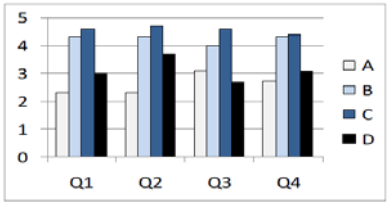

Figure 2. Questioner response by participants as presenter

Q1: Ability to give both Listener 1 and Listener 2 the same amount of attention
Q2: Ability to notice Listener 1's actions
Q3: Ability to notice Listener 2's actions
Q4: Ability to do presentation naturally

OBSERVATION & INTERVIEW

1) Presenter

- Location A – Presenter tends to face the presentation screen while doing presentation. This makes it hard to give the same amount of attention to both students and it was hard to do
- In condition B, C and D, presenters faced the collocated student/monitor in front of them most of the time while glancing regularly at remote scene.
- Location D which is not in the same view of collocated students, monitor nor the presentation screen, required presenters to make an extra effort to notice remote student's activities.
- Location B and D are agreed to create awareness without disrupting a normal learning environment.

2) Listener 1

- Greatly distracted by the remote scene in condition A

3) Listener 2

- Generally no significant difference, though in location A, many are less content knowing students from the other end would be looking at them often
- Some gave up waiting to be called when it took too long to get noticed.

CONCLUSION & FUTURE WORK

We find it is extremely important to provide a tool that allows collaborators to maintain natural teaching/learning behaviors. The results contribute to the creation of a better design of remote collaborative environments by considering aspects such as awareness, distraction and contentment.

In this study, we focused on presenter's behavior towards location of screen. As future work, we will investigate collocated and remote students' behaviors in depth.