

# An Experimental Use of Clickers for a Large Class

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## Abstract

Not all the classes are held in a computer room and classrooms with response analyzers are rare. Yet, it is becoming popular as well as pedagogically meaningful to receive immediate responses from students in our classroom teaching, since interactive classroom environments increase the amount of classroom involvement from the students. We have run four clicker use experiments among 180 students. The questionnaire items are concerned with the use of mobile e-learning, motivational enhancement as well as social skills in relation to Cross-Cultural Distance Learning (CCDL), since all the participants have some experience of CCDL activities and we are about to introduce mobile learning in Discussion Tutorial English. This feasibility study addresses how long it takes to distribute clickers to 180 students, and whether the response data yields statistically valid data.

## Keywords

Clicker, Distance Learning, Construct Validity, Learning Motivation

## 1 Clicker experiments

The use of Clicker was useful, since each time the item distribution was presented immediately on the projector. In this presentation, we will analyze the questionnaire items related to the use of mobile learning, motivation, social skills in relation to Cross-Cultural Distance Learning (CCDL).

### 1.1 Time factor

In the first run, we explained the purpose of the clicker experiments and distributed clickers, taking 20 minutes. We asked 23 questionnaire items. It took 45 minutes to finish the task. This means that I had to teach 90-minute content of English Linguistics within 25 minutes. The students took longer in responding the questionnaire items than expected; we waited till 130 responses were collected. The first session proved that the use of clicker in the large classroom was not feasible.

Since the whole process of distribution and response collection took longer than expected, we

decided to reduce the number of questionnaire items on the second run onward. We presented 11 items, taking 25 minutes, including the clicker distribution time. In the third session we reduced the number of questionnaire items to 10. In the fourth session, we again presented 11 items to the 180 students. Sessions 2-4 did not disturb the lesson plans. Thus, once we restrict the number of items up to 11, the use of clickers in the large class of 180 students is acceptable. The number of responses we managed to collect was in the range of 140 and 132, although 160 students were present in the class. When we collect response data online at Distance Learning Center, response ratio is at most 10% (9%--7%). Thus, we obtain more responses from the clicker media.

### 1.2 Reformatting time

Each clicker is numbered, but the same clicker is almost never given to the same student all through the four sessions. Thus, we need to record participant names and clicker numbers. In our survey, the questionnaire items are all related in each set of motivation questions and social skill questions respectively. We needed to collect consistent response data. Three graduate students input response data and colligated the data set as one. It took them roughly three months, since they input at their free time. This task is reported to be tedious and time-consuming. But we needed to sort the response data so that we could analyze the data on the basis of those in which all the items are answered (38 students) and one or two questionnaire items are missing (78 students).

## 2 Questionnaire

The questionnaire used in this study consisted of three parts: (1) e-learning, (2) motivation questionnaire, and (3) social skills. In this paper, we report the results of Part 2.

### 2.1.1 Part 1: e-Learning Questionnaire

The first part of the questionnaire was concerned with the students' use of mobile e-learning (henceforth, e-learning questionnaire). We asked

three questions.

### 2.1.2 Part 2: Motivation Questionnaire

This part included 21 items developed on the basis of those in the Language Learning Orientations Scale (LLOS: Noels, Pelletier, Clément & Vallerand, 2000; see also, Nakano & Yoshida, 2008), a questionnaire based on Self-Determination Theory (SDT: Deci & Ryan, 1985). Along with the LLOS, these 21 items can be categorized into the following 7 subscales: Intrinsic Motivation for Knowledge (IMK: 3 items); Intrinsic Motivation for Accomplishment (IMA: 3 items); Intrinsic Motivation for Stimulation (IMS: 3 items); Extrinsic Motivation-Identified Regulation (EMID: 3 items); Extrinsic Motivation-Introjected Regulation (EMINTRO: 3 items); Extrinsic Motivation-External Regulation (EMEX: 3 items), Amotivation (AMOT: 3 items).

### 2.1.3 Part3: Social Skills Questionnaire

This part contained 30 items designed to assess social skills. These items have been selected from a questionnaire we developed on the basis of Student SkillStreaming Checklist (Goldstein & McGinnis, 1997) in our previous survey (Yoshida & Nakano, 2010).

## 3 Results and Discussion

### 3.1 Results of Motivation Questionnaire

We analyzed 78 response data in terms of exploratory factor analysis (Principal Factor Analysis followed by Promax rotation). As a result, we extracted five factors which can be interpreted as “Autonomous Motivation”, “Intrinsic motivation for knowledge (IMK)”, “Extrinsic Motivation with external regulations (EMEX)”, “Amotivation (AMOT)” and “Extrinsic Motivation with Introjected Regulation (EMINTRO)” respectively. The indices of Cronbach’s alpha coefficient calculated for each factor are said to be satisfactory, suggesting that the data is reliable, except for EMEX. Table 1 shows the result of factor analysis.

In order to validate the factor structures observed in Table 1, we examined the inter-correlations among the 5 factors in the light of Self-Determination Continuum, one of the hypothesized relationships among the types of motivation discussed in SDT. As a result, we found a sort of quasi-simplex patterns, which represent continuous relationships among the factors (i.e., Self-Determination Continuum), although the number of participants in the current study is small. This result could offer partial evidence with respect to the validity of our data and,

in turn, to the data collection via clickers.

Table 1: The Pattern Matrix

	1	2	3	4	5
EMID3	<b>1.003</b>	-0.206	-0.177	0.113	0.107
IMS3	<b>0.883</b>	0.123	-0.024	0.011	-0.143
IMS2	<b>0.841</b>	0.138	-0.254	0.038	-0.063
EMID2	<b>0.654</b>	-0.005	0.128	0.013	0.161
IMA2	<b>0.537</b>	0.033	-0.049	0.015	-0.047
EMID1	<b>0.513</b>	0.195	0.225	-0.086	0.054
IMS1	<b>0.409</b>	-0.121	0.319	-0.331	-0.154
IMK2	0.049	<b>0.898</b>	-0.071	-0.033	0.044
IMK1	-0.065	<b>0.540</b>	0.245	-0.029	-0.001
IMK3	0.059	<b>0.435</b>	-0.011	0.089	0.012
EMEX2	-0.048	0.018	<b>0.738</b>	0.074	-0.001
EMEX3	-0.178	0.039	<b>0.462</b>	0.163	0.063
EMEX1	0.359	0.010	<b>0.372</b>	0.042	0.147
AMOT3	0.059	0.001	0.031	<b>0.822</b>	0.088
AMOT2	0.054	0.015	0.329	<b>0.690</b>	-0.220
EMINTRO3	0.006	-0.078	0.191	-0.032	<b>0.757</b>
EMINTRO2	0.002	0.134	-0.092	-0.013	<b>0.657</b>
eigenvalue	5.590	1.824	1.563	1.314	1.110
correlation	1.000	.564	.549	-.223	.251
		1.000	.324	-.089	.324
			1.000	-.105	.203
				1.000	-.059
					1.000

Table 2: Inter-Correlations among the 5 factors

	IMK	Autonomous	EMINTRO	EMEX	AMOT
IMK	(.668)	.564	.324	.324	-.089
Autonomous		(.896)	.251	.549	-.223
EMINTRO			(.701)	.203	-.059
EMEX				(.527)	-.105
AMOT					(.725)

Note: The indices in each diagonal element indicate Cronbach’s alpha coefficients.

## 4 Conclusion

The survey data we can collect via clickers needs to restrict the number of items about 10, since it takes 20 minutes to distribute the clickers and collect response data. Although it also takes a lot of time to input the response data onto the excel files, we can collect valid data for analysis.

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### References Selected

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