

## Analysis of Grouping Strategy for Presentation Exercise in Computer Literacy Course

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### Abstract

*Presentation exercise using computer was introduced in the computer literacy course for freshmen. The course consisted of three classes, and the average skill level of the classes had been evenly balanced based on the midterm examination scores before the exercise began. In the classes, the participants were divided into groups of three students. For this, we imposed different grouping strategies for different classes. We taught the course and investigated how the grouping strategies affected the comprehension and skill level of the students. Specifically, by using two-way analysis of variance (two-way ANOVA) with the class and week, we have examined how the grouping strategy affected to (a) mastery of presentation software, (b) exercise itself and (c) group collaborative work. The presentation exercise helped the students positively learn key issues in computer technology and the social aspects of computerization.*

### 1. Introduction

It is said that current trends in education reflect a shift from the traditional didactic pedagogy (one-way teaching from teachers to students) toward student-centered constructivist instructional practices [4]. This is true especially for computer literacy education, and many research and activities have been reported.

We have been teaching a computer literacy course for freshmen in Faculty of Human Science, Osaka University, since 1994. At first, we taught the course in the traditional way. However, we have realized, in the experience, that the one-way teaching does not always work well in the course. Also, another phenomenon has been seen recently. Due to rapid spread of computers and the Internet, the number of the freshmen in the course who have used PCs been increasing (11% in 1995, 70% in 2000, according to our research). Some students have already known operational skill of mail,

web, word processing and spreadsheets covered by the computer literacy course. The course with the traditional teaching style might be boring especially for such students.

Therefore, we have been seeking a trigger to achieve the shift of the teaching style. As a result, we decided to introduce a computer-based presentation exercise in the literacy course. We consider that the exercise is not only for familiarizing computer operations. More importantly, the presentation allows students to acquire skill and attitude of how to search information by themselves, how to deliver their thinking and how to convince others.

Most schools in Western countries seem to introduce presentation training program even in elementary schools, for instance, "Show and Tell" [1]. However, such training courses are rarely seen in elementary education in Japanese schools. Even in universities, almost all classes are still taking the didactic style. Hence, most students tend to miss training of "how to study at university", i.e., how to conduct research in unknown issues by themselves, and present it for others. Recently, some activities to improve this situation have been started in engineering education of Japanese universities.

This paper reports our experience of the presentation exercise in the computer literacy course. What interesting is that based on the result of the midterm examination, we first divided all students into three classes so that each of the three classes does not have significant difference from others, with respect to total skill of students in the class. Next, we instructed the students to form groups of three students for the exercise. For this, we varied strategies of the group organization for every class.

Then, based on a questionnaire survey by the students, we evaluated the presentation exercise through statistical analysis. Specifically, by using two-way analysis of variance (two-way ANOVA) with the class and week, we have examined how the grouping strategy affected to (a) mastery of presentation software, (b) exercise itself and (c) group collaborative work. The analysis showed that the presentation exercise can obtain good results regularly, no matter

what strategy is used for the group organization.

There have been several previous research and evaluation about the presentation exercise(e.g.,[3] [5]). However, as far as we know, there has not been any research that focuses on grouping strategy with statistical analysis.

The rest of this paper is organized as follows: Section 2 introduces how the exercise was prepared and conducted. In section 3, we evaluate the presentation by the statistical analysis. Section 4 reviews the result and discusses points to be improved. Finally, Section 5 concludes the paper with our future works.

## 2. Presentation exercise

### 2.1. Preliminaries

Osaka University opens a computer literacy course as a required course of liberal arts education. The computer literacy course is held for most faculties in the university, and most of the students are freshmen. The course that we have been teaching is the one held for Faculty of Human Science.

The course covers various fundamental issues, e.g., touch typing, mouse operation, Japanese Kana-Kanji translation, Web, Email, word processing, spreadsheets, making homepages, etc. The course lasts for a semester through fifteen segments with 90 minutes each. This paper reports the experience of the course held in the year 2000.

In order to perform statistical analysis of the presentation exercise, we needed to know information about students' competency. Therefore, the exercise was started after the midterm examination.

Using one segment after the exam, we gave a lecture of basics of presentation. This lecture covered the purpose of the exercise and basics of presentation, such as objective, etiquette, questions as well as preparation of slides with presentation software.

### 2.2. Grouping strategies

In the year 2000, we had 144 students for the computer literacy course. Before the presentation exercise, all students had been divided into three classes. These three classes were organized according to the result of midterm examination, so that the averages of students' skill levels for all classes were evenly balanced. Roughly speaking, each class did not have significant difference from others, with respect to total skill of all students.

Let the three classes be Classes A, B and C. For each class, we instructed the students to form small groups for the presentation exercise, so that each group contained three people. For this, we set different grouping strategy for each class, as shown in Table 1.

**Table 1. Summary of grouping strategy**

Class	Grouping strategy
A	Balanced skill. Each group consists of 3 students having marked high, middle and low exam scores.
B	At random. Groups are organized based on alphabetical ordering of students' names.
C	Up to students. The students can form the groups with whomever they like.

Based on these grouping strategies, we tried to analyze how the strategies affected the presentations themselves and students' competency.

### 2.3. Presentation topics

We have selected the presentation topics from the latest issues related to information technology and society. We have taken care of the selection lest the topics should be limited to "computer" only. As a result, we decided the presentation topics for fifteen groups as follows:

#### 1st week: Search engines in the Internet

- T1-1. Search engines in the world
- T1-2. Types and characteristics of search engines
- T1-3. Options for efficient search
- T1-4. Search engines for technical issues

#### 2nd week: Information disclosure in government

- T2-1. Why disclosure?
- T2-2. Local authorities positive on disclosure
- T2-3. Disclosure using the Internet
- T2-4. Comparison between Japan and world

#### 3rd week: Information ethics

- T3-1. Information filtering
- T3-2. Intellectual property rights
- T3-3. Hate sites
- T3-4. Chain letters and spam mails

#### 4th week: Population problem and information society

- T4-1. Population problem in Japanese society
- T4-2. IT business in Japan
- T4-3. Digital divide

**Table 2. Questionnaire survey (related parts extracted from the original survey)**

<b>Question:</b> How do you think about the presentation exercise? For each question, mark a number according to your level of feeling.					
Category	No.	Question	Your Answer		
C1	1.	Did you master to make presentation files with text only?	(I don't think so)	1	2 3 4 5 (I quite agree)
	2.	Did you master to insert graphs and diagrams in the presentation?	(I don't think so)	1	2 3 4 5 (I quite agree)
	3.	Did you master to edit presentation files in the outline mode?	(I don't think so)	1	2 3 4 5 (I quite agree)
C2	4.	Was the topic assigned to your group appropriate?	(I don't think so)	1	2 3 4 5 (I quite agree)
	5.	Was the time for the presentation and discussion sufficient?	(I don't think so)	1	2 3 4 5 (I quite agree)
	6.	Were the comments from the audiences (students) useful?	(I don't think so)	1	2 3 4 5 (I quite agree)
	7.	Was the presentation exercise worthwhile for you?	(I don't think so)	1	2 3 4 5 (I quite agree)
C3	8.	Was the group organization reasonable?	(I don't think so)	1	2 3 4 5 (I quite agree)
	9.	Were you able to communicate with others in the group?	(I don't think so)	1	2 3 4 5 (I quite agree)
	10.	Did you contribute to the collaborative work?	(I don't think so)	1	2 3 4 5 (I quite agree)
	11.	Did you enjoy your task in the group?	(I don't think so)	1	2 3 4 5 (I quite agree)

## 2.4. Presentation guideline

At the end of every lecture, a presentation topic was assigned to each group. In addition to the topics, we gave the groups simple hints, which are references of Web resources related to the topics, to make students' research efficient. During a week till the next class, each group was required to study the topics, prepare presentation slides, and practice the presentation.

The presentation exercise was conducted by using latter half of each lecture of four weeks. Each group was allowed to use seven minutes for the presentation, and three minutes for discussion. The computer lab is too large to perform the presentation with a projector. Therefore, we instructed the students to operate teacher's terminal, which can broadcast the screen image to extra monitors allocated between every pair of students' terminals. After each presentation, we spared a short time for questions from the students, and we, teachers, gave comments to the students.

We prompted the students to evaluate the presentations each other. Specifically, we prepared a mailing list for each class, and the students post their opinions, advice, and impression for each presentation to the mailing list.

It was also important to convert the presentation files to HTML and upload them as Web online contents. By doing this, the students were able to review the presentations of other groups, which were also useful for the groups that had not finished their presentations yet.

## 2.5. Evaluation by students using questionnaire survey

After the computer literacy course was finished, we assigned a self-assessment questionnaire survey to all students. Table 2 shows eleven questions, with respect to the

presentation exercise, that are extracted from the original survey.

The questions can be classified into three categories C1, C2 and C3. The three questions from No.1 to 3 (Category C1) are about the self-assessment of the presentation software. The four questions from No.4 to 7 (Category C2) are related to the exercise itself. The last four questions from No.8 to 11 (Category C3) are about the collaborative work in the groups.

For the answer, we have used the five-point Likert scale [2]. That is, the students mark one of the five grades from 1 to 5 for each question, based on their self-assessment. We got total 135 effective answers.

## 3. Statistical analysis

In order to evaluate the effectiveness of the presentation exercise, we have conducted a statistical analysis based on the questionnaire shown in Table 2. The primary concern is how the grouping strategy affected students' competency.

### 3.1. Overview

In the analysis, we used the grade in the Likert scale as a score of the analysis. We considered that there are two key factors in the presentation exercise. The one is the *class* (A,B,C. See Table 1), since the grouping strategy of each class is different from those of others. Another is the *week* of the presentation (from 1st to 4th. See Section 2.3), because a hypothesis is reasonable: the later week a group make a presentation in, the better the group does it, since the students in the group can review presentations of earlier groups.

Taking the class and week as primary factors, we analysed the answers using two-way analysis of variance (two-

way ANOVA), with respect to Categories C1, C2 and C3 (See Section 2.5).

In the analysis result, we could not observe the significant *interaction* of the class and week for all questions in Categories C1, C2 and C3. For Category C3, the *main effect* of the class was statistically significant in the question No.9: “Were you able to communicate with others?”. Taking this fact into consideration, we have investigated all the categories with respect to the class, as shown in the following subsections.

### 3.2. Result for C1: Software operation

Figure 1 shows the average scores of the questions in Category C1. In the figure, the horizontal axis shows the questions of C1 shown in Table 2, while the vertical axis plots the average scores of Classes A, B and C.

We can see in the figure that the score of Question No.1: “Did you master to make presentation files with text only?” is relatively high. This fact implies that the students are confident of making at least simple presentation files. However, they are far from mastering perfectly all features of the software. Since there is no significant difference in scores between classes, it can be seen that the grouping strategy did not influence students’ competency in the software.

### 3.3. Result for C2: Exercise itself

Figure 2 shows the average scores of the questions in Category C2. From the figure, average scores of all questions except for No.6: “Was the comments between the students useful?” were relatively high. This implies that the students were interested in the exercise. Since this tendency can be observed for all classes, the exercise was conducted in an appropriate way in all classes. The reason why the score of No.6 was low is that we could not spare enough time for the questions and discussion, due to the limited time.

As for students’ evaluation of the exercise itself, we could not see significant impact of the grouping strategy.

### 3.4. Result for C3: Group collaboration

Figure 3 shows the average scores of the questions in Category C3. In the result, we could see a significant difference in Question No.9: “Were you able to communicate with others in the group?”. The score of Class C is higher than those of others. As mentioned in Section 2.2, grouping strategy for Class C is “no restriction”. Therefore, most of the groups in Class C seem to be organized by friends close each other. This might give an influence to active communication in the groups.

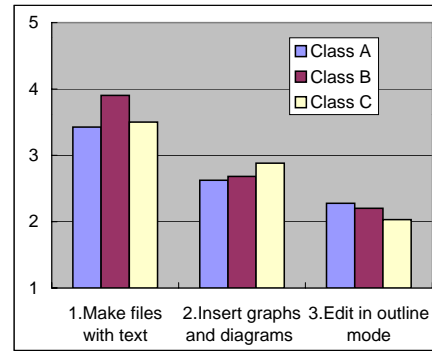


Figure 1. Competency in software (C1)

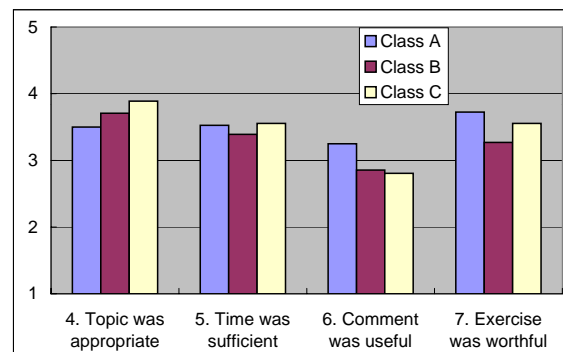


Figure 2. Evaluation of exercise itself (C2)

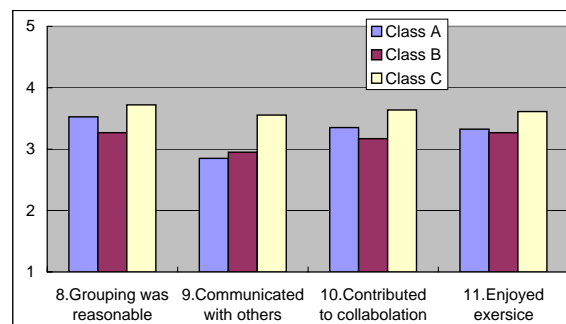


Figure 3. Effect of group collaboration (C3)

For other questions, the average scores of Class C are higher than those of other classes as well. However, for these questions, all classes mark absolutely high scores. From this, it can be seen that few students had negative opinions on the grouping strategy itself.

In other words, we can see a significant effect of the grouping strategy in the group collaborative work.

#### 4. Discussion

The primary objective of this work was to examine the effect of the grouping strategy towards the presentation exercise. Different strategies were applied to three classes in which average skill of the students are evenly balanced.

Reviewing all statistical results, the grouping strategy did not appear as significant difference in students' competency very much, although the effect was observed in a small part of questions.

From this fact, we could conclude that the presentation exercise can obtain good results regularly, no matter what strategy is used for the group organization. However, note that the analysis was conducted based on students' self-assessment (the questionnaire survey) only, and that we did not evaluate the quality of presentations themselves. Hence, we need to examine the relationship between the grouping strategy and the quality of the presentation as our future work.

There were also limitations on our presentation exercise due to various constraints.

**Limitation on the presentation time:** In the exercise of year 2000, we set the presentation time to only 7 minutes for each group. This lack of time sometimes imposed difficulties to make a clear presentation.

**Limitation on the course schedule:** Since the course must also cover a lot of computer literacy issues other than the presentation, we could not spare much time for the exercise. As a result, each group had only one presentation in the course. With second presentation, the students could have improve themselves by reviewing their first presentation.

**Limitation on the presentation equipment:** The students had to utilize the extra monitors (see Section 2.4) for the presentation. So, the presentation style became different from the usual style with a projector and screen. Because of this, they could not practice well important techniques such as usage of pointer and eye-contact to the audience.

Taking these limitations in consideration, we believe that we can improve quality of the future exercise: for instance, reexamination of the course schedule.

#### 5. Concluding remarks

In this paper, we have presented our experience of a presentation exercise introduced in a computer literacy course. The exercise was evaluated through the statistical analysis with respect to competency in software, evaluation of the exercise itself and effect in group collaboration. The analysis showed that the presentation exercise can obtain good results regularly, no matter what strategy is used for the group organization.

Some topics for future research present themselves. Firstly, we need to examine the relationship between the grouping strategy and the quality of the presentation. Secondly, a refinement of the questionnaire survey is important as well. In 2001, we are now incorporating similar presentation exercise, dividing classes according to the skills of students. It is also interesting to analyze the grouping strategy with different class configuration.

#### Acknowledgments

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