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# Effects of the Captain System and the Class Tutor System in Business Data Visualization Class and Computer-hands-on Classes

*Extended Abstract*

*Pedagogical Study*

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## Abstract

Experiences of implementing two methods of teaching in Business Data Visualization classes and Management Information Systems classes are discussed in this paper. The two methods of teaching are: (1) the Captain System, where a captain of each group signals whether an instructor can proceed to the next step and (2) the Class Tutor System, where students who nominated as a class tutor help other students. The results of an informal survey indicate that the two teaching methods are effective tools for student learning in the context of computer-hands-on training courses.

**Keywords:** computer hands-on, captain, tutor, response card, peer teaching, and teaching method

## Introduction

The author hoped to run computer hands-on classes in such a way that no one was left behind as long as one was motivated to learn. Two instructional methods were used to ensure that everyone was able to follow what was being taught. They were: (1) the Captain System, where a captain of each group signals whether an instructor can proceed to the next step and (2) the Class Tutor System, where students help other students. In this study, the two teaching methods are discussed so that teachers can utilize them in computer hands-on classes.

## Captain System and Class Tutor System

### *Captain System*

The author grouped 2 – 4 students (based on their location proximity) into a group and designated one of the students as the captain of that group. The author gave a pair of cards (pink and blue, 10 x 5 cm. See the first picture of Figure 1) to each captain of a group. After demonstrating a couple of steps, then the author asked captains to show a card. Captains' role was to show either one of the two cards when the author asked them to show a card. A blue card indicates that the group has successfully completed the current step hence an instructor can proceed to the next step. A pink card means that the group needs more time hence an instructor needs to pause the demonstration until the captain shows a blue card later. A new captain is designated in the next class so that all the students took a captain's role at least once. Students were encouraged to volunteer to serve as a captain and the participation mark (10% of the course) partly depended on the number of time that a student served as a captain.

There are several reasons why the author implemented the Captain System. First, the author wanted to check whether every student was on the same page with minimal effort of an instructor. Secondly, the author thought that it would be more efficient to ask captains rather than to all students as the author could check the class state with fewer cards (the class size was 30 and the author needed to check around 8 cards to check the state of a whole class). Thirdly, it was quick to notice the color of a card than students' voices or gestures. According to an article about business data visualization (Knaflic 2015), the color difference is a kind of precognitive attributes, which one can recognize faster even before one attends on colors. Hence it was expected that the author could notice them with minimal cognitive effort.

The captain system can be viewed as a new variation of the response card system, where students hold up a response card (e.g., red or green, true or false, or own write-up) to indicate their answer on an instructor's question(Kellum et al. 2001). Use of the response card system can increase the frequency of participation per student, the number of students who participate (Narayan and et al. 1990), students' performance or learning(Cavanaugh and et al. 1996; Gardner and et al. 1994), and reduce off-task behaviors (Kellum et al. 2001). While the Captain System is similar with conventional response card systems in the sense that students hold up a card when an instructor asks a question, the Captain System differs from extant response card systems in several ways. First of all, in the Captain System, it is the captains (rather than individual students) who hold up a card hence the captain's answer is an answer of a group rather than that of an individual. Second, the nature of the question differs. In the case of the Captain System, the question is about the state of a group hence both cards can be a correct answer, hence the answer is less likely to imply an individual student's competence. In contrast, in the case of the extant response card systems, the question is about the subject knowledge hence, an incorrect answer might be interpreted as an individual student's incompetence.

### *Class Tutor System*

The role of a class tutor is to help other students during his or her idle time by walking around other students in the class and answering questions of students. In return, a class tutor receives 0.5% of course credit per class. For example, after the author's demonstration, practice questions were given. Class tutors' role was to first complete the practice questions by themselves and then to help other students to complete the practice questions by answering any questions raised by students individually. In the hands-on training context, it would take a long time to handle all the questions from students if an instructor answered individual students' questions sequentially. Class Tutor System was designed to ease this

situation. The class tutor was recruited in two ways. First, in the first class, the author encouraged students to apply for a class tutor if a student already has experiences with MS Excel or Tableau. Secondly, when the author found a student who finished practice questions early, the author solicited the student to serve as a class tutor for that class. A class tutor was supposed to wear a name sticker (the second picture of Figure 1) so that students could see he or she was a class tutor to whom students could ask questions individually. This was a way to recognize class tutors socially, leading them to be more active in sharing of their knowledge (Sangmi et al. 2016).

Extant literature (De Lisi 2002; Goldschmid and Goldschmid 1976; Velez et al. 2011) discussed this kind of tutor system as peer teaching, peer learning, or student as a teacher, and reported that peer teaching resulted in positive impacts on both peer teachers and students.



**Figure 1. Pink and blue card used in the Captain System and a name sticker for class tutor**

## Informal Survey on Captain System and Class Tutor System

To understand any potential positive and negative effects of the Captain System and the Class Tutor System, an informal survey was conducted at two undergraduate and two sections of a graduate class between 2017 and 2018.

The results indicate that most of the students were satisfied with the Captain System (90%) and recommended to keep using it in the next course (89%) and that most of the students were satisfied with the Class Tutor System (90%) and recommended to keep using it in the next course (91%).

## Discussions

With the Captain System, the author was able to notice easily whether or not students were able to follow the author's demonstration. Students could control the speed of the class at their own pace and learned more. One possible disadvantage was that students had to wait until the last student completed the task, slowing down the speed of the class.

With the Class Tutor System, students did not have to wait for a long time to ask a question to an instructor. Instead, they were able to ask questions to their classmates who had expertise in the subject. The Class Tutor System made it easier for students to ask other students as class tutors were officially named as tutors whose responsibility was to help other students.

This paper has significant practical implications by suggesting the two effective methods of teaching in a computer-hands-on class. Practitioners can apply these teaching methods to their computer-hands-on classes.

Theoretically, this study proposes a unique variation of the response card system. To the best knowledge of the author, no studies proposed the Captain System or similar in the context of computer hands-on class.

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