

Peer Assessment of Oral Presentation: An investigative study of using Clickers in First-year Civil Engineering Class of a reputed Engineering Institution

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Abstract - Oral presentation skill is a key characteristic of modern engineers and that is why it is an essential component in engineering education. According to the social cognitive perspective, feedback and assessment play an important role in teaching and learning. This study describes the implementation and evaluation of oral presentation for a class of 56 students (both male and female) of First-year Civil Engineering. An innovative instruction format that builds on the integrated use of a Student Response System (SRS) for peer assessment of oral presentations of First-year Engineering students has been implemented. Oral presentations for about 56 students were conducted and assessed where in the participants played both the role of assessor and assessee. Further, this paper also throws light on the certain investigative methods of using clickers in the classroom to enhance students' participation. Results mirror a very positive student attitude towards SRS. The SRS was reported as an effective way of producing feedback for presenters, assessors and educators.

Keywords-Student Response System; feedback; peer assessment; oral presentation skills; students' participation; clickers.

I. INTRODUCTION

Feedback and assessment play an important role in teaching and learning of oral presentation skills. This study describes the implementation and evaluation of an innovative instruction that uses a Student Response System for peer assessment of oral presentations. A large number of oral presentations were assessed and students' perceptions and learning progress concerning the particular instructional approach was investigated. Further, a comparative analysis of male and female students' assessment was also made. Results show that the Student Response System was an effective way to produce feedback for presenters, assessors and educators. Results also revealed a very positive students' attitude towards the instructional format. The learning effect concerning assessment was rather limited. This paper centers on an innovative instructional approach that makes use of a 'Student Response System' (SRS) to implement peer assessment. For this study a class of 56 students of first year Civil Engineering of a reputed Engineering Institution was taken into consideration. An SRS allows a large group to respond to questions displayed on a screen. Responses are entered with remote devices and instantly summarized

and presented to the class in visual format (Kay & Le scores by peers of oral presentations.

II. LITERATURE REVIEW

Clickers are considered appealing to the media literate generation who 'are both familiar with technology' and 'reluctant to suffer impassive learning silently' (Murphy, 2006, p.1). Most of the literature on clickers investigates teacher/student perceptions, with the focus tending to target the 'affective benefits' of clickers, which include greater student engagement, increased student interest, and heightened discussion and interactivity (Stowell and Nelson, 2007). Typically, educational researchers who use clickers in their classes focus their reports on the functionality of the technology in encouraging student participation and active learning in class time (Nelson and Hauck, 2008). Guthrie and Carlin (2004) point out that, modern students are primarily active learners, and that lecture-based courses may be increasingly out of touch with how students engage their world. Clickers, it is generally argued, move beyond the teacher-focused lecture model to allow engagement in large classes through interactivity from students to teachers, and potentially between students. This potential for increased student engagement, however, depends on the development of creative pedagogical activities within the class and with the technology, as it has been pointed out that clickers may simply 'feign interactivity' (Socol,2008).

Nevertheless, clickers are increasingly in demand, particularly for large classes (Guess, 2008). But while the popularity of clickers rest on their appeal to the media literate student, many scholars are dismissive of this popular cultural factor, even as they comment on the positive aspects of the clickers' 'game approach' that engaged students more than class discussion (Martyn, 2008 p.71) or their similarity to the 'electronic voting systems' of television programs like *Who Wants to Be A Millionaire* (Jenkins 2007, p.528). Indeed, Banks recounts disparaging reactions by other scholars to his trials of clicker technology as 'infotainment' or 'edutainment' (2006, p.383). Although there are of course dangers associated in introducing popular cultural media or approaches into the classroom, they can be educationally rigorous if they are introduced with pedagogical principles in mind, since student enthusiasm 'may be predicated on novelty, fun,

richer learning environments, or a clearer sense of being a member of a learning community' (Campbell, 2007, p.385). Students are heavily influenced by the hidden curriculum. They look for assessment clues and use these to drive their study effort. Very little out-of-class student learning activity is unrelated to assessment (Gibbs, 1999). While supporting research has shown increased student achievement and improved behavioral outcomes for students who are actively engaged with the course content and increased dialogue and interaction with the instructor and peers (Crouch & Mazur, 2001; Mintzes & Leonard, 2006; Slater, Prather, & Zeilik, 2006), "a key instructional implication from the research on learning is that students need multiple opportunities to think deeply and purposefully about the content and to gain feedback on their learning" (Ueckert & GessNewsome, 2006, p. 147).

III. PURPOSE OF THE STUDY

While peer evaluation strategies in higher education classes have been widely recognized as a positive strategy to promote active learning, concern about the potential for bias based on personality is at the heart of student resistance. This study was conducted in a class of 56 students of first year (II semester) Civil Engineering students. This study was conducted as a part of weekly oral presentation sessions conducted by a team of faculty members. The study involves the investigation of the potential use of classroom response systems, or 'clickers', to engage students in the evaluation of class presentations, while alleviating their anxieties about peer pressure and personality bias. Students' familiarity with mobile communication technologies like mobile telephones and gaming devices meant that they quickly adapted to the more limited level of interactivity offered by the clickers, but also raised interesting questions about whether the clickers themselves served to alleviate their anxiety about peer evaluation. Hence, the objectives of this study are as follows:

- To foster student engagement in the classroom
- To encourage peer instruction and formative assessment to enhance learning
- To discover how clickers can assist students in their learning experiences, resulting in revised instructional procedures
- To encourage faculty to develop processes to implement the use of an SRS

IV. METHODOLOGY

Weekly individual presentation schedule was prepared by the instructor prior to the presentations. A class population of 56 students (male -30, female-26) was assessed based on their oral presentation on technical topics like, Super structure, Transportation Engineering, Flyash bricks etc. The duration of the weekly seminar classes was approximately 1 hour and 40 minutes and a total number of 60 hours were allotted for oral presentations. All classes had the same instructor. Each

student was required to make a presentation lasting approximately for 15 minutes, on a topic selected of his or her own choice as mentioned above. The presentations began as soon as the students are given individual clickers to assess presentations. On an average, each student performed the presentation for about 12 minutes. And on certain occasions, for example, presentation on *Burj Al Arab* the duration was for about 20 minutes. The presentations continued until the end of the session.

After the presentations were over, class discussion would follow and then the peer assessment process using clickers was done. This peer evaluation took about 15 minutes. Presentations were assessed by the instructor on criteria given in the subject outline with portions of the mark assigned to content, delivery, timing and the use of visual aids. A detailed report was sent through mail to each presenter in the week following the presentation. In fact, clickers were also used for identifying the random numbers of students who would give their presentations the next week.

The criteria used for the peer assessment include verbal and non-verbal communication skills, subject knowledge, delivery of content etc., the criteria were modeled on those used by the instructor but adjusted to be more suitable to the expertise of the student audience. For example, audience were asked to assess the content in terms of whether the presentation offered a clear view point, an adequate depth of response and level of research, provided suitable support for its claims, and was appropriately pitched and well organized. Delivery was assessed by whether the speaker appeared interested, spoke at an appropriate speed, addressed the whole class, and spoke clearly and audibly. The question on timing was omitted, since the objective was to focus on providing quality time for the speakers to present their topics. After class discussion, it was decided that students would respond to the questions with a number ranging from 1 (very negative) to 10 (very positive). In the classroom, the instructor could see on the screen whether all clickers had responded before moving to the next question. Clickers were distributed randomly, so all responses remained wholly anonymous and students became familiar with their use before presentations began.

The clickers resembled a smart phone and offered students the choice of ten buttons to push for their response. Their responses were sent wirelessly to the instructor's laptop via a receiver and software supplied with the clickers. The software automatically produced a tabular list of responses from each clicker to each question at the end of the peer assessment. This list was transferred into an Excel spreadsheet which calculated both an average peer response to each question and a total weighted mark. The spreadsheet was required because the clickers were being used in a way which the designers of the supplied software did not seem to anticipate. The following bar chart is a representation of the individual scores of 56

students (male and female) of first year Civil Engineering, in oral presentations. In x-axis, S1-S56 is a representation of students' names in the alphabetical order.

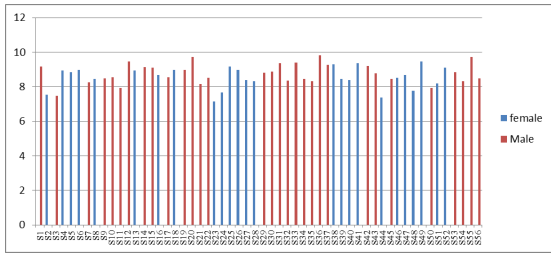


Figure 1. Bar chart on the individual (male and female) scores for 56 students

At the end of each session students shared their experiences of using clickers to the instructor. If there were any specific queries related to assessing the presentations, it was clearly addressed. Further, these discussions also covered the students' reactions to the technology, its use for the provision of peer assessment of presentations and the place of peer assessment in awarding marks. It is important to note that after presentations on technical topics the instructor also conducted quiz on general aptitude and test of reasoning skills which promoted ample opportunity for class individual attention and class interaction.

V. ANALYSIS AND INTERPRETATION

It is observed that the average score of the male students are higher compared to the female students. This difference could also be the result in the percentage of population of male students (54%) compared to that of the female students (46%). The highest score awarded by the students through peer assessment is 9.83 for S-36 and the lowest score is 7.15 for S-23. The class average score is 8.52 on a scale of 10 marks. It was clear that the peer assessment process had a powerful effect on most students.

TABLE I. CLASS AVERAGE OF ORAL PRESENTATION SCORE

Gender	Population	Cumulative score	Average
Male	30	263.70	8.79
Female	26	213.55	8.21
Total	56	477.25	8.52

Below is a sample assessment chart by students on a certain student's oral presentation. It is observed that 18 students, (considered to be the majority of the total population in this case) had given 10 out of 10 score for the presentation and the lowest score by 2 students who had given 3 out of 10 score. The feedback chart had a considerable setback, when the number of absentees for a particular oral presentation session increased. It is also observed that at the beginning of the first week of oral presentations, the students' inexperience in evaluating the presentations was apparent. As a result of which, a skewed distribution was obtained. But week after week, the

students gained a lot of experience in assessing, therefore, the distribution of marks appeared to be normal. (Refer Figure. 4.

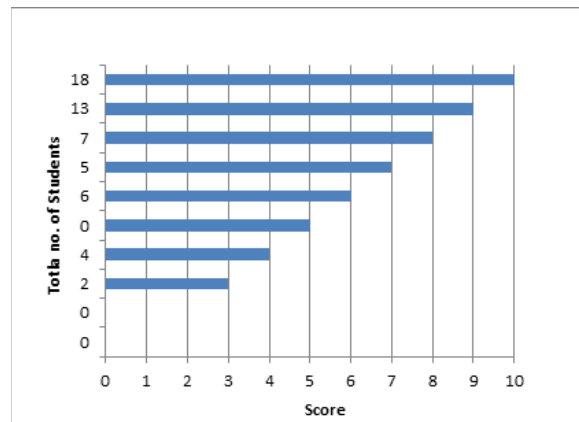


Figure 2. Sample assessment score by students in the beginning of presentations

Clickers, served as a comprehensive tool to assess the oral presentations of first year students. It created a contributive environment in the class for active learning and discussion. Students seemed to be completely relaxed when they shared mutual feedback. Hence, introducing an appropriate SRS for such activities proved to create student-centric atmosphere in the classrooms.

Discrepancies were calculated between the scores given by an individual and the mean score of all the peer evaluations of one presentation. The sum of these discrepancies is considered a raw indicator of the assessment quality. And on those occasions when the instructor observed an apparent bias in the assessment given by the students, he pointed it out during one on one feedback analysis. Bias factor was observed when the instructor's observation and feedback qualitatively differed from that of the students'. Further, a minute to minute feedback was provided by the instructor after the end of every presentation session.

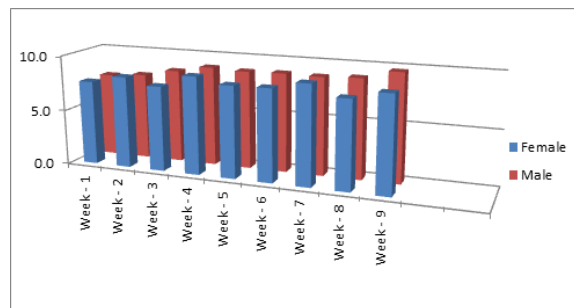


Figure 3. Average scores of students during the period of assessment

From week – 1 to week – 9 of assessments, students improved their presentations as well as assessment. There seems to be a considerable improvement in the chart gradually from the beginning till the end.

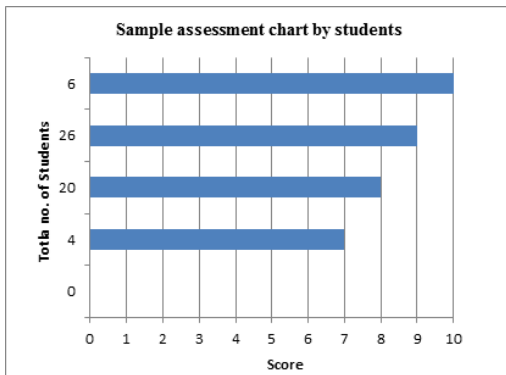


Figure 4. Sample assessment score by students in the due course

The above chart is an assessment during the course of the presentation. In a few weeks of assessment the students have gained considerable experience in awarding marks for their classmates. Some of the feedback shared by the students includes, “Clickers have improved my level of interactivity in the classroom. I have become more focused in the classroom teaching”, “It is interesting to know my classmates react to certain presentations, thereby, I could possibly check my quality of assessment.”

VI. CONCLUSION

Overall, the peer assessment for oral presentations revealed that students found the peer evaluation a rewarding activity, as it encouraged class engagement, critical evaluation, student-to-student interaction, and the improvement of individual’s presentation skills. Students appreciated the use of the clickers in the context of this peer assessment activity for their functionality, novelty and, most particularly, anonymity. This study also highlighted the challenges with assuming the neutrality of educational technologies. The clickers were originally chosen for their ability to engage students in peer evaluation in an anonymous and user – friendly fashion, with the side benefits of allowing for an easy collation, analysis and distribution of the peer responses to the marking criteria for each individual presentation by the teacher. Their appeal, as an educational version of more familiar mobile communication devices, was anticipated to contribute to students’ engagement with the process.

However the neutrality of clickers in this peer evaluation context was undermined by their very familiarity, as students had been habituated to the process of voting using communication technologies. This popular culture contextualization potentially reinforced student anxieties about peer evaluation process. One proposed solution to overcoming these concerns could be to give students more

opportunities to use clickers in peer evaluation activities so that they are familiarized with both the process and its outcomes.

Anonymity and confidentiality of the process was beneficial in producing candid feedback from the student audience. The close correspondence of the peer and tutor marks in the trial were successful in producing valid peer assessment. While the way clickers had been used to produce this feedback is not well established in the literature on clicker use and produced some reservations in the students, it is believed that using the technology for this purpose has great potential to increase student engagement in an important aspect of their learning in small classes.

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