

A Multi-Perspective Approach to Technical Presentation Assessment

Prashant Bhav^a, Vinay Topkar^b and Makarand Bhonsle^c

Associate Professor, Civil & Environmental Engineering Dept, VJTI, Mumbai^a, Professor, Civil & Environmental Engineering Dept, VJTI, Mumbai^b, Research Scholar, Civil & Environmental Engineering Dept, VJTI, Mumbai^c
ppbhav@vjti.org.in

Structured Abstract

BACKGROUND

Technical presentations are integral part of any engineering course. In Indian institutions offering engineering education, the number of students in a class is more than 70. Therefore for the paucity of time, very often these technical presentations are done by a group rather than an individual. Through these presentations, in addition to the technical expertise, many other important generic attributes like communication and team building also can be developed. However, conventionally these attributes of the technical presentation are rarely assessed either in a summative or formative sense.

PURPOSE

The purpose of this experiment to find effectiveness of summative and formative assessment of the group presentations from multiple perspectives by different assessors; technical perspective by a technical expert, presentation perspective by a generic skills expert, and from the perspective of other students by using tools of peer assessment.

DESIGN/METHOD

Students are divided in groups and are asked to present on a technical topic assigned to the groups three weeks in advance by the faculty. Students are expected to do the research, discuss with the faculty, prepare presentation and collectively present the same to the panel of two experts (one expert is the course faculty who acts as a technical expert and other expert is a generic skills expert) and the remaining class. All students of the class, other than those giving presentation are also expected to assess the group doing presentation on the basis of parameters provided to them. After each presentation, both the experts give their feedback to the class and try to fill in the gaps if any in the presentation. A questionnaire survey was conducted at the end and the feedback was analysed.

RESULTS

The conventional assessment generally does not give importance to generic skills involved in such presentations and the assessment rarely documents the assessment of such skills. This method of multisource assessments assesses the presentations from different perspectives leading to well documented assessment and feedback given after each presentation improves the presentation skills of the students.

CONCLUSIONS

Technical presentations can be used to make teaching learning process more interesting and more effective. If multiple source assessment is employed, it not only gives different perspectives of assessment but the elaborate assessment and feedback by the experts also help individual students understand their shortcomings and overcome the same.

KEYWORDS

Multisource assessment, Technical presentation.

Introduction

While writing a Policy Research working paper for the World Bank on 'Employability and Skill Set of Newly Graduated Engineers in India', Andreas Blom and Hiroshi Saeki (2011) have identified that the skill shortage remains one of the major constraints to continued growth of the Indian economy. They found that employers perceive Soft Skills (Core Employability Skills and Communication Skills) to be very important. Skill gaps are particularly severe in the higher-order thinking skills ranked according to Bloom's taxonomy. They also noted that communication in English is one of the most demanded skills by the employers. They recommended that Indian engineering teaching institutions should refocus the assessments, teaching-learning process, and curricula away from lower-order thinking skills, like remembering and understanding, toward higher-order skills, such as analyzing and solving engineering problems, as well as creativity.

A move in this direction demands a relook at the existing teaching-learning and assessment process of the Indian undergraduate engineering education. The same has to be oriented towards development of the Core Employability Skills and Communication Skills. However, this needs to be done integrating the same in the delivery and assessment of technical knowledge as under no circumstances the core technical content of the course can be ignored.

Background

Institutions of higher education in general are continuously challenged with a demand for competency-based learning. A curriculum should focus more on competencies such as learning to learn, interactive skills, communication skills, information processing, problem-solving and skills (Tillema, Kessels and Meijers, 2000). For development of such skills, contemporary approaches emphasize the active engagement of students in their own learning, learner responsibility, metacognitive skills and a dialogical, collaborative model of teaching and learning. (Spiller, 2012) Furthermore, as noted by Boud and Falchikov (2006), active participation by students in assessment design, choices, criteria and making judgments is a more sustainable preparation for subsequent working life.

Active involvement of students in the assessment can be ensured by introducing the peer assessment as well as self assessment along with conventional assessment. There is a considerable overlap between self and peer assessment, as the student is assessor in both but in peer assessment, the student assesses his peers whereas in self-assessment the student assesses himself / herself. The parameters for the assessment and the standards for the assessment are expected to be same in both the assessments.

According to Boud (1995), all assessments including self-assessment comprise of two main elements: making decisions about the standards of performance expected and then making judgments about the quality of the performance in relation to these standards. When assessment by students is introduced, it should ideally involve students in both of these aspects. Engaging students in the formulation of criteria for self-assessment tasks helps them to deepen their understanding of what constitutes quality outcomes in a specified area. (Sluijsmans and Prins, 2006). As mentioned by Verloop and Wubbels (2000), being able to interpret the work of colleagues and peers is a necessary prerequisite for professional development and for improving one's own functioning.

The process whereby individuals evaluate the performance of their peer is called peer assessment (Falchikov, 1995; Freeman, 1995). To be effective, however, peer assessment training should be embedded in the existing material that is designed according a performance-based approach (Mehrens, Popham and Ryan, 1998). Being able to interpret the work of colleagues and peers is a necessary prerequisite professional development and for improving one's own functioning (Verloop and Wubbels, 2000). Many researchers believe that encouraging students to assess each others' contributions to discussion and

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discourse, as in peer assessment, further exposes them to the skills of critical reflection and analysis (Birenbaum, 1996; Sambell & McDowell, 1998).

Self-assessment is a process of formative assessment during which students reflect on and evaluate the quality of their work and their learning, judge the degree to which they reflect explicitly stated goals or criteria, identify strengths and weaknesses in their work, and revise accordingly. (Andrade and Du, 2007) Self-assessment with its emphasis on student responsibility and making judgments is “a necessary skill for lifelong learning” (Boud, 1995).

The conventional practice

Technical presentations are integral part of any engineering course. In Indian institutions offering engineering education, the number of students in a class is more than 70. Therefore for the paucity of time, very often these technical presentations are done by a group rather than an individual. Through these presentations, in addition to the technical expertise, many other important generic attributes like communication, lifelong learning and team building also can be developed. However, conventionally these attributes of the technical presentation are rarely assessed either in a summative or formative sense.

Conventionally each group is allotted a topic on which it has to give a presentation to the class and the concerned faculty. Typically such a presentation is followed by a question answer session which is like a public defense of the presentation by the group. However, as per the experience of the authors invariably it is only the faculty member who asks the critical questions pointing the gaps in the presentation. The students from the remaining class do not ask any questions. A feedback from the students for such behavior points to two major reasons for this indifference. The first one is likelihood of upsetting the students in the presenting group provoking them to ask hostile questions during the presentation of group of those students asking questions. The second one is sheer lack of interest in topics allotted to others. Such groups are interested only in their presentation. The faculty judges the group presentation on the basis of overall impression formed during the same and judges individual students on the basis of the question answer session after the presentation. The assessment is based on the technical content of the presentation as well as the presentation skills of the presenter but the weightages attached to different aspects in technical as well as presentation skills are neither quantified nor communicated to the students. The opportunity for the faculty to give timely feedback to students on different aspects of the presentation so that further presentations can be improved is not utilized in this exercise. Such presentations are done in group and the resulting presentation is an outcome of teamwork. However the instructor never gets any information about the group dynamics and therefore fails to assess students on the individual group member's contribution towards the presentation.

Technical presentation gives an opportunity to students to express themselves in front of an interested audience. This exercise can be used to improve his / her communication skills. An audience of peers is an ideal audience to judge the effectiveness of the delivery of technical matter under consideration. A constructive feedback from the peers and the instructor can be used to improve the effectiveness of the performance of the student.

The experiment

The authors decided to have a relook at this accepted practice of technical presentation and introduce the practice of peer assessment and self assessment in addition to the conventional assessment by the subject faculty. The idea of the experiment was to make use of technical presentation in improving generic skills of the students with help of summative and formative assessments done from different perspectives.

This experiment was done in XXXX for the third year students (Semester VI) of the four year Bachelor of Civil engineering program for the course of Environmental Engineering.

Students were divided in eight groups of 8 to 10 students. Even though conflict resolution is a desirable skill it is not addressed in this experiment. A conscious decision was made to avoid conflict amongst students of the group. With this in mind the groups are constructed by allowing the students to form groups of their choice thereby ensuring the basic comfort level of the students within the group.

Each of this group was asked to present a technical topic assigned to them three weeks in advance by the faculty. These topics were part of their curriculum but are not covered during the session by the faculty. The topics which were chosen for the presentation were:

- I. Air Pollution Episodes
- II. River Pollution in India
- III. Biomedical Waste Management
- IV. Emission from Manufacture and Disposal of Plastic
- V. Occupational and Environmental Hazards
- VI. Noise Pollution in India
- VII. Automotive Pollution
- VIII. Water Conservation

All the above topics are not only technical but are directly related to the society in general. Students were instructed to include the social angle as well in their presentation. Sustainability was also an issue they were supposed to handle in their presentation.

It was told to the groups that their presentation will be the only teaching – learning exercise conducted for that particular topic. After the topics allocation, a discussion was conducted in the class about the aspects on which these presentations were to be assessed. In fact the technical as well as presentation aspects on the basis of which the assessment will be done and the level of achievement expected in each of these aspects was decided in consultation with the students. This was done so that they clearly understand and take into consideration these aspects while preparing their presentation. It was also made clear that in the final theory examination the class may expect questions on these presentation topics. This was done to ensure active participation during all the presentations from the rest of the class. Students were expected to do the research on the allotted topic, prepare presentation and collectively present the same.

Two or three such presentations were done each week. Each presentation was allotted twenty five minutes time slot in which all the students of the group had to do the presentation. So every student on an average gets two to three minutes to present his / her part of presentation. The presentation was done in front of a panel of two experts. Each group presentation was assessed by the remaining students of the class and also by these two experts. One of the experts was the concerned faculty as the technical expert and the other expert was the generic skills expert.

After each presentation, the technical expert addressed the entire class and gave his comments about the technical aspect of the presentation done. These comments were related to possible additions, deletions, deliberations and some gaps in the presentation. His comments were pertaining to and restricted to the contents of the presentation and not about the presentation itself. For every presentation he ensured that the presentation and his comments together delivers to the class the technical content which needs to get delivered as per the objectives of the course.

After his comments, the generic expert offered his comments to the class. He addressed only the presentation aspect and never dealt with the technical aspect of the presentation. His comments were pertaining to the presenter and the presentation and possible improvements in the same. His feedback about the individual presenters were individualistic but about the presentation was about the group effort. The comments about the presenter were about the language used, voice modulation, body language etc whereas about the group presentation

were about the font used, color scheme used, graphics used, slides numbering, reference quoted etc.

Each of these presentations was assessed by the rest of the class on the basis of parameters provided to them at the start of the experiment. These were technical parameters as well as presentation and communication parameters. They were asked to rate each presentation on the basis of each parameter on the scale of 0 to 10. The members of each group were asked to assess other members of the group about their contribution to the presentation. The assessment was done on a scale of 1 to 10 and the assessor was asked to assess himself also on the same scale.

A questionnaire survey was done at the end of all the presentations to find out the effectiveness of this type of exercise. The feedback about effectiveness of delivery vis-a-vis delivery by the faculty was also collected in the same questionnaire. The opinion of students about the need and usefulness of proper training course about presentation skills was also sought in the questionnaire. The completed questionnaire was considered as part of the term work making it compulsory for each student to submit it.

A discussion was conducted in the class about the findings of the questionnaire and the opinions of the class about many aspects were noted.

In the final examination paper, questions were asked about each of the eight topics of presentation.

Analysis of assessment and questionnaire data:

Every student had assessed each group including his / her own based on the parameters given to him on a scale of 0 to 10. For each group, two averages were calculated for each parameter, one of the group members and other of the remaining class. Both these averages were communicated to each group and then major differences in the assessment of parameters, if any were discussed with the members of the group.

Thereby there were three assessments for each group for each aspect of the assessment. Self assessment done by the members of the group, second one is peer assessment made by the students from the rest of the class and last, the assessment done by both the experts. In the expert assessment, the technical part was assessed by the faculty whereas the generic part was assessed by the generic skills expert. The final summative assessment for each student was done as follows:

1. Each factor in the group assessment was given equal weightage and each group assessment was converted to a single digit by adding all the factor-wise assessments.
2. The weighted average of the group assessments made by the faculty, the peers and self assessment by giving the weightages of 50%, 30 and 20% respectively which gave the final assessment of the group.
3. The internal grading done by the group members facilitated the final summative grading as otherwise there was no access to the work done by the individual group member in the team. It was observed that contribution of some team members was negligible which otherwise would not have got noticed and they might have scored average of the other team members. Factors were calculated by dividing the group summative assessment by the highest assessment in the group. The group assessment was multiplied by these individual's factors calculated from the peer assessment within the group to calculate the individual's summative assessment.

Result and Discussion

Analyzing the questionnaire responses and the subsequent discussions with the class led to the following observations:

The feedback from the class about comparison of lecture method of delivery vis-a-vis presentation was taken. The corresponding question in the questionnaire was, “Do you think this method of presentation offers a better way of knowledge acquisition as compared to lectures by the teacher?” Students were given five choices namely ‘Lectures are the best’, ‘Lectures are better than presentations’, ‘both are same’, ‘presentations are better than lecture’ and ‘presentations are the best’ and they were asked to tick the one they agree with. The analysis showed that the percentage of students with the opinion of lectures being better than presentations as a mode of knowledge acquisition were 37 %. It was noted that exactly equal percentage i.e. 37% students opined that presentations are better than lectures. The percentage of students having no preference over any of them was 18%. Only 8% found presentations to be the best delivery model for knowledge acquisition. None of the students found lectures to be the best way of knowledge acquisition. Diagram for the same is shown below in Figure 1.

The feedback from the class about the need of proper training course about better presentation was taken. The corresponding question in the questionnaire was, “Would you like to attend a proper training course which can help you to make better presentations?” Students were given five choices namely ‘not required’, ‘such a course will help a bit’, ‘don’t mind attending such a course’, ‘such a course will help greatly’ and ‘badly need such a course’ and they were asked to tick the one they agree with. Everybody felt the need of such a course but only 10% expressed the feeling that they badly need it. Around 14% of the students felt that it will help them a bit whereas 67% percent of the class thought that such a course will help them greatly. Only 9% expressed a neutral attitude towards such a training course. The Diagram for the same is shown below in Figure 2.

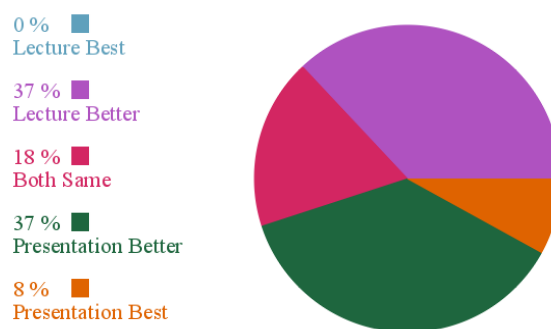


Figure 1: The comparison of Lecture mode and Presentation mode

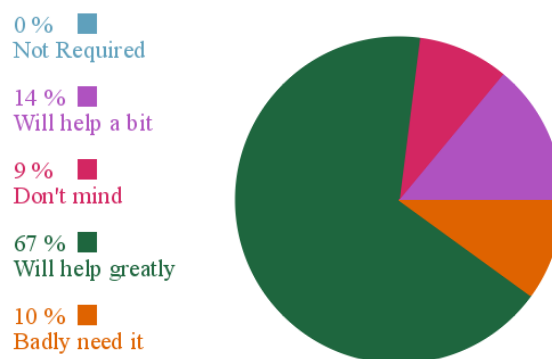


Figure 2: Need of a proper Training Course for doing Presentation

When these results were further analyzed we found that 95% of those who had said that lectures are better had also said that a course on presentation would help greatly. Remaining 5% were of the opinion that such a course is badly needed. When the authors discussed this feedback with the students in the class room, students confirmed that with better presentations the presentation mode of delivery would be certainly more effective than and as welcome as the lecture mode. The students also felt that if such assessments are done more frequently, then a separate course on presentation may not be needed.

The generic assessment was improving from the first presentation to the last indicating the feedback for the previous group was having a positive effect on the later groups improving their performance.

Students shared their view that while assessing others, they realized their own faults and improved on the same in their presentation. It helped them to reflect on their work. Playing the role of an assessor gave them a different perspective to look at their work.

When the authors shared the comparison of assessment made by a group with assessment of the group made by its peers, majority of the students realized that their self assessment was on the slightly higher side. They admitted that the comparison of self and peer assessment leads to reflection and authentic assessment.

Those students who had not contributed much in the presentation were assessed by their peers in the group badly and therefore their final assessment was also bad even though the group assessment was much better. This authentic assessment would not have been possible without using the tool of peer assessment.

It was expected that the group members do research to research for collecting information for the presentation. It was noticed that the entire class had used internet as the main source of information, text books were distant second and technical journals still a distant third. It had to be emphasized time and again that before copying from the internet, the authenticity of the source has to be ascertained and due credit has to be given to the source.

It was expected that those students who had presented a particular topic will score well by attempting the questions on that topic in the final examination. Not only this was found to be true but students also attempted questions on topics from other groups and performed equally well. This indicated that technical presentation was successful as an effective delivery model.

Conclusion

The conventional assessment generally does not give importance to generic skills involved in such presentations and the assessment rarely documents the assessment of such skills. This method of multisource assessments assesses the presentations from different perspectives leading to well documented assessment and feedback given after each presentation improves the presentation skills of the students.

Technical presentations can be used to make teaching learning process more interesting and more effective. If multiple source assessment is employed, it not only gives different perspectives of assessment but the elaborate assessment and feedback by the experts also help individual students understand their shortcomings and overcome the same.

The tools of self-assessment and peer assessment help the student to reflect on their work and make the teaching learning process more interesting.

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