

A Study of Evaluation of Group Study Quality

Tetsuro FURUKAWA

Kanazawa Institute of Technology 7-1 Ohgisima, Nonoichi, Ishikawa 921-8501,
furukawa@neptune.kanazawa-it.ac.jp, URL:www.kanazawa-it.ac.jp

Masakatu MATSUIISHI

Kanazawa Institute of Technology 7-1 Ohgisima, Nonoichi, Ishikawa 921-8501,
matsuiishi@neptune.kanazawa-it.ac.jp, URL:www.kanazawa-it.ac.jp

Shigeo MATSUMOTO

Kanazawa Institute of Technology 7-1 Ohgisima, Nonoichi, Ishikawa 921-8501,
matsumoto@neptune.kanazawa-it.ac.jp, URL:www.kanazawa-it.ac.jp

Kazuya TAKEMATA

Kanazawa Institute of Technology 7-1 Ohgisima, Nonoichi, Ishikawa 921-8501,
takemata@neptune.kanazawa-it.ac.jp, URL:www.kanazawa-it.ac.jp

Taketo YAMAKAWA

Kanazawa Institute of Technology 7-1 Ohgisima, Nonoichi, Ishikawa 921-8501,
yamakawa@neptune.kanazawa-it.ac.jp, URL:www.kanazawa-it.ac.jp

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ABSTRACT: *The objectives of our Engineering Design are not only to educate engineering design process but also to educate total engineering ability. We focused to educate teamwork and enforced six systems to promote teamwork. We explained the results especially the correlation study between team evaluation and the standard deviation of contribution evaluation.*

1 INTRODUCTION

Kanazawa Institute of Technology has been aimed to educate their students to become active engineers after they go out in the society. To realize this objective, Engineering Design 1&2 implement to freshmen and sophomore, and are compulsory subjects for all students. We focused to educate teamwork ability to 5 classes, 31 of team this time, and enforced six systems to promote team activity. Until now, investigations analysing personal ability evaluation method for the group work subjects¹⁾, has been reported. The methods to measure teamwork quality are not reported. As it is not clear now to measure this teamwork quality, then, we regard as the teamwork quality equal team output as a result of team activity. In this paper, we would like explain the correlation study between the team evaluation(record) and the team members peer evaluation.

2 CLASS MANAGEMENT AND SYSTEMES TO PROMOTE TEAM ACTIVITY.

2.1 Class Management

Engineering design 1, 2 is implemented for about 1800 all freshman and sophomore. Each class is composed of 30 to 40 students of the same major course and each class is divided into 6 to 7 teams. So that one team composed of 5 to 7 students. Each team carry out engineering design process until a solution created from the finding of the familiar project themes. As an example, the project themes which the team of one class of the electric course sophomore enforced in 2003 are listed in Table 1.

Table 1. 2003 Project Theme of Electrics Course Students Class		Table 2. Main Items of Team Evaluation and Its Distribution (total 70 points)	
Team No.	Project Theme	1. Submission Files of Every Week	15
1	Traffic Signal Light Using Solar Cell	2. 4,6,8 th Oral Presentation	5
2	Road Grating not to Fall Dead Brief in to the Drainage	3. Final Oral Presentation	10
3	Roof Top Garden	4. Final Submission File	30
4	Total Measures of Garbage Collection Area for a Crow	5. Poster Session	10
5	Design of KIT Whole Area Map of Looking Easy		
6	Road Components to Reduce Traffic Accidents		

2.2 Systems to promote team activity

At the beginning of the subject, we lectured the key points related to the teamwork and furthermore, we prepared the following 6 systems to gain the teamwork ability. 1. Parts called team leader, recorder, class master, must be shared and turned in rotation with all team members every week. 2. The team leader of each week works so as the team output to be biggest and submit the leader report. 3. The recorder must submit weekly report in which all activities are recorded. 4. The class master records numbers of times of all activities, such as, presentation, question, answer, etc, of all team members. 5. At the end of every week, each team make activity plan which shows division of work, schedule, etc. 6. At 5th and 9th week, all members evaluate each member's contributions to the team activity mutually.

3 HOW TO EVALUATE A TEAM RECORD

The main items of the record evaluation of the team and distribution are listed in Table 2. Those details are explained in the following. The submission files evaluated every week with 10 to 20 items, and 84 items total, about the quality on each design process. For an example, 4th week evaluation items are listed in Table 3. As we showed in Table 3, there are many subjective items in the evaluation method. The evaluation items of oral presentation presented in 4, 6, 8, 9th week, are listed in Table 4. As you can see, it composed of the quality of contents and slide in addition to the presentation time and greeting manner. Final submission files are evaluated with 30 items. As you know, total evaluation items are 138. We evaluated with those so many items to expect as same standard as possible, because we took charge of five major students, that is, mechanical, electronic, environment, architecture, information.

Table 3. Evaluation Items of Final Submission File (4th week 12 Items)

Did it submit within time limit?(-3 points)
1 Does it suitably be written using appointed sheet
2 Does it written clearly and easy to understand
3 Dose all members work equally?
4 Does leader report filed?
5 Does office hour record filed?
6 Does Fish-bone diagram make suitably?
7 Does objective and important factor suitable
8 Does the ideas explained using high quality figure
9 Does the ideas written in easily understanding
10 Does the ideas create more than 10
11 Does Recording sheet filed?
12 Does all member submit personal assignment

Table 4. Evaluation Items and Its Distribution of Presentation

1 Greeting manner etc.	1
2 Quality of presentation	3
3 Presentation material quality	3
4 Conclusion	2
5 Accuracy of presentation time	1

4 THE CONDITIONS OF CLASS

As an example, the project theme of a electric course, were shown in Table 1. At the beginning of the every week, the teacher held the short lecture related to the activities of that week. After that, each teams work together on exercise or their project theme. Photograph 1 is the state that a student is explaining to a participant and Figure 1 shows one of the posters they made for this poster session.



Photo 1 – A poster session scene



Figure 1 – An example of poster

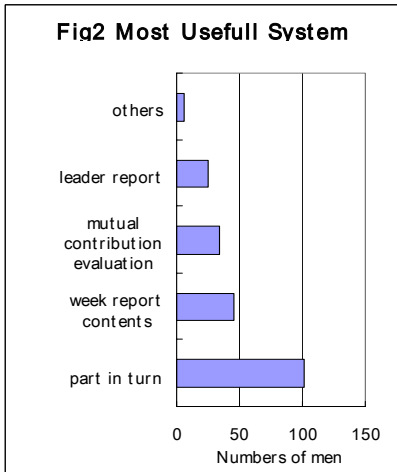


Fig. 2 – Most Use full System

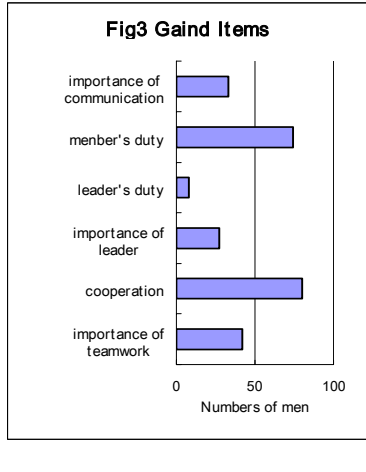


Fig. 3 – Gained Items

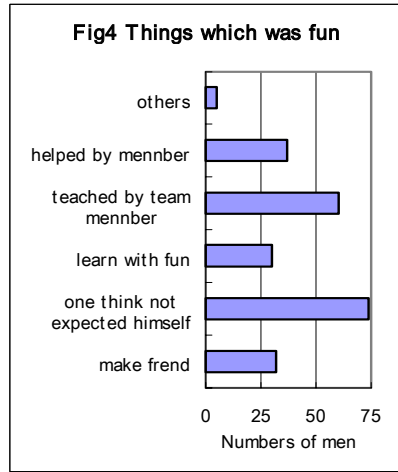


Fig. 4 – Things which was fun

5 THE EXAMINATION OF THE EFFECTIVENES OF THE SYSTEMES TO PROMOTE TEAM ACTIVITY

5.1 Evaluation of the students after the class end

At the end of the term, about the team activities, in all the class, following three questionnaires was taken. 1.what systems were most effective to learn teamwork?. 2.what did they learned in this class? 3.what was good in this class? Figure 2 to Figure 4 show the results of these answers. Student feels to that the best effective system to learn teamwork is the parts turns in rotation and to that they learned team member's duty in this subject. The best things doing teamwork in the class was that, 1.they found that other person think various different thinking, 2.they learned many things out of their team mate, 3.they were helped by their team mate. It could think with the most important nature of the member in the team activities and these were the harvests which weren't expected.

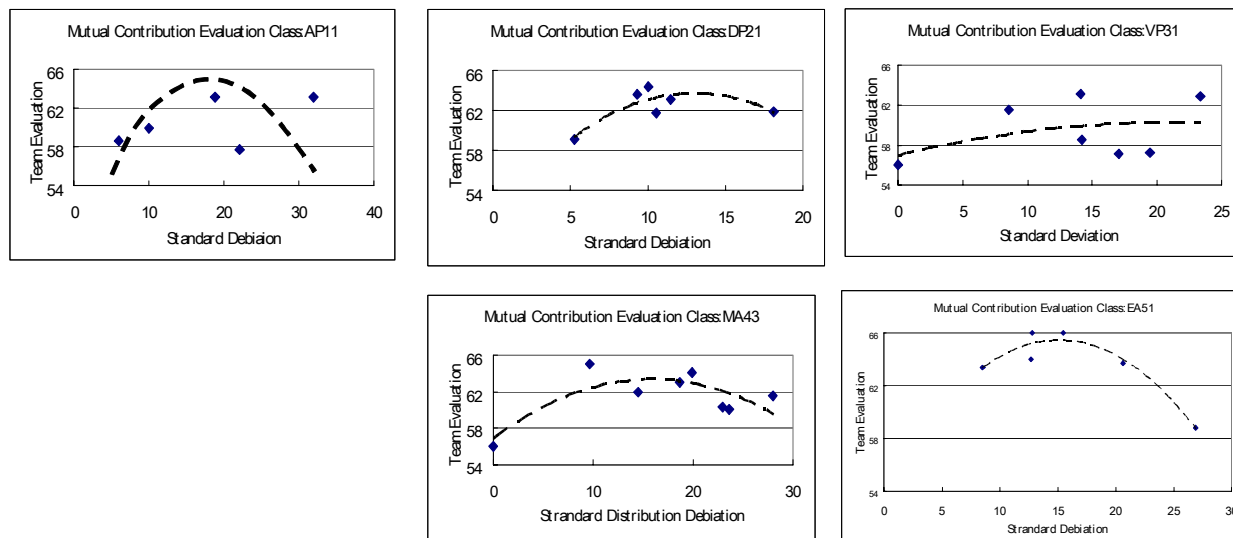


Fig. 5 – Correlation between Team Evaluation and Standard Deviation of Mutual Contribution Evaluation

5.2 Correlation investigation between the team record and the standard deviation of the mutual contribution evaluation.

At 5th and 9th week, we took the questionnaire to evaluate each member's contribution of the team activity mutually (average is 100 points), and investigated its standard deviation. The results of each class versus team record are shown in Figure 5. The dotted line shows two-dimensional curve identified by least squares method. As the results, it is clear that 1.the distribution shape is vortex on the top, 2.horizontal axis value of the maximum points is about 15%. From the observation of students, it is clear that no willing students generally wrote same valuation, on the other hand, the deviation of the mutual contribution evaluation become large value of the team in which the excellent student is joined. We think that each members in which team almost all team members work together, evaluate the contribution of team mate cool.

6 CONCLUSION

We implemented this subject for the students to become active engineers after they go out in the society, and the subject was focused on teamwork. To evaluate its systems or class management method, after the subject was finished, we took the questionnaire to the students, as the results, the system parts turns in rotation and making weekly report are use full for learning team work ability. And the standard deviation of the peer evaluation has clearly correlate with team evaluation, and when the standard deviation is about 15%, team evaluation become max and team activity is considered to be best. We will put forward this investigation to be more reliable in the future, and clarify a few exceptional cases.

REFERENCE

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