Team Grading in Capstone – What the Students Think When They Grade One Another

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Abstract

As part of the transportation Capstone track at Northeastern University, students work in small teams, ranging in size from 4-6 members. Over the course of the 14-week semester, each student has various responsibilities, typically assigned by another student who functions as the leader or project manager. Most of the work is performed on an independent basis – the student works on their component and then submits it to the team. The material is then integrated into the final product.

Throughout the semester, the faculty advisor meets with the team on close to a weekly basis. Based on the interactions in the weekly meetings, the advisor has an appreciation for what students the students are working on – those that are doing the work and those that are not contributing. As a result, the advisor was often required to grade the student on the work that was submitted by the team and participation at weekly meetings.

Although this approach was objective, it was not the most comprehensive – it lacked peer input for team members. The students may experience something on a daily basis that may not be observed in a meeting – missed deadlines, lack of contributions – all elements that should be included when grades are issued.

In order to address this challenge, the capstone advisor implemented a self-grading requirement. Twice a semester, at the mid-point and end, students have to grade their work as well as their peers. During this self-evaluation, no rubrics are provided; the student is responsible for not only detailing their contribution, but also supporting their grade selection with prose and examples of their work.

In order to quantify the team-grading structure and determine its efficacy, as well as identify whether or not “grade” boosting is occurring in capstone, a survey was conducted of the three most recent graduating classes. This paper presents the findings from that survey.

Introduction

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In order to have a better appreciation of what students were actually contributing, the advisor uses team member reviews at two points over a semester, to inform grading. Students are required at the midpoint and end of semester to provide a grade as well as written feedback regarding each team member’s participation. The students also have to evaluate themselves. Each student must include the rationale behind their grade, as well as a summary table of their work, and examples of their work.

This approach has reinforced observations from the team meetings as well enlightened the instructor. Student feedback has indicated that it has changed their work habits, has helped them appreciate the amount of work that is required in a project, and given them an appreciation for assigning a “letter grade” based on others’ work.

Background

The transportation capstone at Northeastern University is structured similar to an engineering consulting firm. The students form small firms, which typically range in size from 4-6 students, and re-design real-world municipal projects. Over the semester, students meet formally in the classroom, and for more than 60% of the time, the “consulting” firms meet with the instructor as a team.

The interaction between the instructor and the group usually lasts for an hour a week. During the meeting, the students update the instructor on progress and the instructor asks questions and guides the students. During this time, the instructor interacts with all of the students, although not all of the students interact with the instructor.

Most consulting firms, at the beginning of the semester, break the work up into small, manageable sections. Each student may be responsible for a section, or multiple sections. Based on a typical project, a student may be responsible for designing, in a computer-assisted program, writing a chapter in the final report, or conducting field visits and collecting on-site data. Although the responsibility of each student varies, as well as the depth of the work, each student is expected to do his best, and contribute to the overall success of the project. As a result, there is typically very little discussion as to who did what and how one section required more work than the other, and more of the overall required effort, and why it may or may not have been up to expectations.

Since the students are working on the project together throughout the semester, they are the best option to provide meaningful feedback for their peers. The instructor has an appreciation from group meetings, presentations, and deliverables, as to the progress and
commitment; however, he does not have an appreciation for the workload of each student. The weekly meetings are extremely helpful and insightful in terms of who is contributing along the way; however, it is only for an hour a week. Moreover, the end product may exceptional; however, it may not have been a true “team-effort”.

The students with the high-grade point averages may be working harder than the others, to make sure that the final product is of the quality that is expected. As a result, those students should be getting higher grades than the others, if they are doing more work, and that work is of a higher quality.

In order to ensure that the students receive a grade that reflects their level of effort over the entire semester, and not just the final product, the instructor in the transportation capstone has turned the grading over to the students for the last three years.

Instructors in the US have used peer grading and self-evaluation with varied success. A general concern of this system is that grade boosting and reduction will take place, interfering with the objectivity of the evaluations. A study done by Kaufman, Fleder, and Fuller at North Carolina State University determined that there was very little difference between the peer rating and self-rating, while 6% of the students gave themselves a higher rating, and 14% gave themselves a lower grade.

Before the end of each semester the instructor sends an email to the students requesting grades from the students. The instructions in the email are nebulous, by design. The instructor did not want to limit the student’s assessment approach. If a specific rubric was provided, the students may provide responses that fulfill that requirement, and nothing else. In order to receive the most thoughtful assessment material, the instructions required the students to provide the following:

“Similar to what you did at the mid-semester point, you will be evaluating each team members’ participation (including yourself) from the beginning of the semester to now. You will provide a recommended grade (e.g., A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F) next to each of your name and your colleagues’ names on the spreadsheet posted to Blackboard. You must also provide supporting prose for all responses, including yours on a separate Word document”.

The students’ grades are meant to inform the final grade, and are not used as the sole assessment mechanism. At the end of the semester, during the final presentation, the instructor assigns each group a grade, based on the final presentation, and the deliverables from the entire semester. After the grades for each group are identified, the instructor reviews the peer-provided grades, including the written material that was provided by the students that supports their grade selection.
Study Methodology

A survey was conducted to assess students’ view of the peer grading in capstone. The survey consisted of nine questions, several of which built on a previous question. Some of the major questions were:

- Providing a grade for myself and colleagues was: Helpful Stressful Other:

- A grading rubric was not provided for you, instead, you had to rely on what you thought an effective rubric would be. Was this approach helpful?

- Would you recommend providing a rubric in the future?

The survey was distributed via email to 39 students from three of the most recent capstone classes (i.e., 2011, 2012, 2013). Out of the 36 possible participants (old email addresses), 12 responded (response rate = 33%). Based on the results, the students appreciated the opportunity for peer review and most (75%) of them found the process to be more helpful than stressful (Figure 1). Only three of the respondents thought that assigning grades was stressful — of the three, one said that he/she did not have an appreciation for the other students’ work, while two of the students responded that they didn’t want to assign a grade that was less than what others may have given the student.

![Figure 1 Team Grading Survey Results – Students that thought providing a grade for them and colleagues was helpful/stressful](image-url)
If the students responded that providing a grade for them was helpful, they were then asked why it was helpful. Two answers were provided:

- It allowed me to reflect on what I did and deserved; and
- It made me appreciate others’ contributions in a way that I hadn’t thought about before that time.

The respondents were not limited to only selecting one of the above choices. As a result, 90% of the respondents thought that the team grading approach “allowed me to reflect on what I did and deserved” while 80% of the respondents “made me appreciate others’ contributions in a way that I hadn’t thought about before that time” (Figure 2).

![Figure 2 Team Grading Survey Results – Students that thought providing a grade for them and colleagues was helpful – if so, why?](image)

One of the challenges of providing a team-grading environment is giving students too much grading detail or not enough. By providing too much detail, the students will follow the explicit instructions and give the instructor exactly what he/she asked for. Although it may be viewed as helpful, it has the potential to be the opposite. By providing a very rigid, structured, rubric, the students may evaluate one another based on the rubric provided. Although there may be opportunity for thoughts and opinions, it may not provide an ideal environment for students to reflect on their peers’ work as well as theirs.

By providing less structure, the instructor may have concerns regarding the quality and quantity of the content received. For both evaluations, during a given semester, the students were asked to:
• Provide a recommended grade (e.g., A, A-, B+, B, B-, C+, C, C-, D+, D, D-, F) next to each of your name and your colleagues’ names.

• Provide written support, at least one paragraph long that supports the grade selection for you.

Based on the survey responses, most (91%) appreciated the approach from class (Figure 3).

Figure 3  Team Grading Survey Results – A Detailed Grading Rubric was not provided - instead, you had to rely on what you thought an effective rubric would be. Was this approach helpful?

The survey respondents were asked if the instructor should provide a grading rubric in the future. Every respondent (100%) said no (Figure 4).
Figure 4  Would you recommend the instructor provide a rubric in the future?

One of the challenges of turning the grading over to the students is that they may not accurately identify the appropriate grade or they may focus on one element that influences the grade in a negative manner. Based on this grading approach, the following hypotheses were identified –

This approach may be subjective - some students may not grade themselves or others accurately – they may try to “boost” their grade or lower someone else’s, and may not provide a grade that truly reflects the contributions and effort; and

Students issuing a grade may find it stressful for many reasons

In order to determine whether or not the self-grading students were boosting their grade, an analysis was performed on the grades from the last three years.

Grade Analysis

An analysis was performed on the final grades from the last three years of capstones (2011-2013). Over the three years, there were 78 students that started the class, 1 withdrew and two did not provide self or team evaluation; as a result, 75 student grades were analyzed. At the end of the semester, every student submitted a grade for him/her, as well as for each student. The grade was a letter grade, ranging from an A+ to F. In addition to the letter grade, each student was required to submit an explanation that supported the assigned grade, for themselves as well as for their peers.

Each grade from the last three years was compared to the final grade, as well as with each student’s grade point average (4.0 scale). Based on the grades, 57.3% of the students received the grade that they expected (Figure 5). Out of 75 students, 12 percent gave themselves a grade that was higher than their final grade, and approximately 31 percent
of the students graded themselves lower than the final grade. Out of their entire group, eight percent of the students gave themselves the highest grade, and eight percent gave themselves the lowest grade.

![Figure 5 Students Self-Grade for the Semester – Transportation Capstone, by Percentage (n=75)](image)

**Figure 5** Students Self-Grade for the Semester – Transportation Capstone, by Percentage (n=75)

Self-Grade vs. Grade Point Average (GPA)

An analysis was performed on the self-grades vs. the student’s GPA. One hypothesis that was considered was that students that had a low GPA may try to “boost” or increase their overall GPA by giving themselves a high grade. The average GPA of all students in the transportation capstone was 3.05. The GPA for the majority of the students that provided the matched grade ranged from 2.43 to 3.99 (Figure 6). When the self-grade was higher than the final grade, the students GPA ranged from 2.22 to 3.75. When the self-grade was lower than the final grade, the student’s GPA ranged from 2.02 – 3.67.
An additional analysis was performed to determine how different the self-grade was from the grade received (Figure 7). Out of all of the respondents, 20 of the students received grades that did not reflect their expectations (self-grade). The self-grade was compared to the actual grade – 1 grade difference indicates that the student was expecting an A, but received an A-. Out of the 20 students, 16 (80%) received a grade lower than expected.
Conclusions

Team-grading in a capstone setting appears to be a useful mechanism to assess performance. The students cited many benefits, and there didn’t appear to be a bias (e.g., grade boosting) in the grading. Based on a student survey, a high percentage of students found it helpful because it allowed them to reflect on their contribution as well as assess their peers’ contributions.

The survey responses indicated that students were comfortable without receiving a grading rubric from the instructor. Moreover, all of the respondents stated that they did not recommend providing a rubric in the future.

Grade inflation did not appear to be a concern. Based on the self-given grade that each student identified, approximately 57% received the same grade that they thought they deserved. Many of the students were modest – approximately 31% of the students graded themselves lower than the final grade. Only 12% of the students gave themselves a grade that was higher than their final grade.