

Grading with a Team

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Abstract

This paper reports on a team grading approach where teaching assistants work with the instructor to grade assignments. The major benefits include timely completion of grading, consistent grading, graders staying on task in a the team environment, instructor gets feedback on students' understanding from grader, and instructor gets new insights from graders. There is also a social aspect to team grading that makes the task more pleasant.

Introduction

Grading homework is the most universally despised task for all teachers. Even though I am writing about grading, I must make it perfectly clear that I despise grading and expect that any sane person does. On the other hand, grading is an important part of teaching. It is important that students complete homework and that the homework be graded and returned in a reasonable amount of time. Meaningful feedback helps students. We, the teachers, also benefit from grading. When we grade, we find out what the students understand (or don't understand). If our grading is timely, we can base our next lecture, discussion, or homework on what we saw in the homework. If our grading is not timely, we miss an opportunity to leverage on the homework.

Grading Experience

I am currently grading in a way that gets the ugly job done quickly, increases the quality of the grading, and gives good feedback on how well the students are doing. It is a team grading approach. I work with my teaching assistants at regular times to grade homework assignments and quizzes. I teach an introduction to computing course. It is a four-credit course with approximately 112 students each semester. Four teaching assistants help with the closed labs and grading. Together we grade four items for each student almost every week. I have 4,000 to 5,000 grades by the end of semester. Obviously this class is a grading nightmare. I also have a teaching assistant for a software engineering course. There are 45 students in the course and the teaching assistant works with me for 1 to 2 hours per week. In both situations I find the team approach superior to doing the grading myself (of course) and better than handing off the grading to a teaching assistant. I also believe that the teaching assistants benefit more from the team approach to grading than if they graded by themselves.

The major benefits are:

- Timely completion of grading resulting in timely feedback to students.
- Consistent grading because one person is responsible for one portion of the task.
- Graders stay on task in the team environment.
- Instructor gets feedback on students understanding from graders.
- Instructor gets new insights from graders.

You don't need four teaching assistants and a class of 112 students to take advantage of team grading. Even if you have grading help for an hour or two a week, the team approach to grading is still beneficial to you, the teaching assistant(s), and the students in your class.

Large Class Team Grading

First, I will describe the team grading experience with the large class. Because the large class is an introductory course, many of the students are underclassman and small assignments help them manage their studying. Each week a 20-minute quiz is given. Each week's lab has a pre-lab assignment, the lab work itself, and a post lab assignment. The post lab assignment is a programming assignment and is the major task for both the students and graders.

The grading approach features "grading parties". Both the post-lab and quiz are graded in a grading party. After the quiz, at least two teaching assistants and I meet to grade. The task usually takes 1 to 1 ½ hours. Each person is responsible for one or two questions. If someone is done early, they will either tally grades or help with another question.

Grading the post labs is more difficult. All four teaching assistants work with me to grade the post labs. One person grades the header comments, one person grades the output, and two people grade the program body. The last person helps grade either output or header comments, depending upon the problem. Each person grades according to predetermined criteria. The task usually takes 1½ hours to 2 ½ hours.

There are several advantages to the grading party approach:

1. Consistent grading: One person is responsible for one item and can maintain consistency over the whole set of papers. Also, the papers are graded one time rather than dividing the grading over multiple sessions.
2. Immediate feedback to the instructor: Because I attend the grading parties, I hear remarks about the questions and the students' responses. Actually our grading parties are quite noisy with people expressing surprise over answers, comments, or approaches to problems.
3. Graders stay on task: Because we must complete grading before we leave, everyone stays on task.
4. Timeliness: Homework assignments and quizzes are completed and returned in within a week.

Like all professors, I have considerable experience grading. I worked as a teaching assistant during my Ph.D. program and grading was my major task. The classes were large, 70 to 90 students, and the professors never helped grade. Sometimes the professors did not provide a grading key. Admittedly there were fewer graded items – no more than one per week. In addition, I am sad to admit that my feedback on the students' papers was weak. Also, my feedback to the professors was poor to non-existent. Even though I saw that the students were having problems with certain parts of the assignments, I often forgot to inform the professor.

When I started teaching, I followed the model from my Ph.D. institution – midterm, final, and weekly assignments for my classes of 35. Because I had no teaching assistant, I simply slugged through the grading. Dr. John McCormick joined our faculty in 1997 and

introduced me to group grading. I believe that the improvement in the quality and timeliness of this grading approach is worth reporting.

Consistent Grading: A key with answers and deductions for errors is supplied. If the teaching assistants find errors that were not covered on the key, we talk about the error and establish a deduction. Because one member of the team grades one item on all papers, we get consistent grading. Even when a grader receives help, the second person will use the first person's grading model. Also, we grade in one session and I believe this helps consistency. When I grade alone, I take breaks and when I come back consistency suffers.

Graders Stay on Task: In the team situation everyone stays on task. When I grade alone, I have a hard time staying on task. Some of my work avoidance behaviors include (1) the refrigerator (not good for grading or my figure), (2) talking to anyone who wanders by my office (they must need my advice and that is more important than grading), and (3) counting how many papers are left to grade and calculating the percentage done. I'm sure you can add to this list. Staying on task is a great time saver. When I go to a grading party, I know there is no stalling. Also, we do not grade in my office where the phone can ring or students can interrupt.

Homework Assignments are Returned in a Timely Manner: We do not leave the grading party until the grading is done, scores totaled, and papers stacked alphabetically. We have a regular time scheduled each week for quiz and program grading. All grading is returned in the closed lab sessions and because of the schedule, all students receive their material in less than one week.

Another advantage of team grading is that over the semester I get to know my teaching assistants. I enjoy working with them. Although grading is a dreadful task, it is many times better when made into a semi-social activity. At our quiz grading parties we often bring treats. When we are grading an especially ugly programming assignment, I bring treats.

Two Person Grading Team

Second, I will describe a two person grading approach. For a software engineering course with 45 students I had one teaching assistant for 1 to 2 hours per week. We would meet at a regular time in my office. We had two types of material to grade. The first were short answer questions with well-defined answers. These were easy to grade. Second, we had material that does not have exact correct answers such as graphic model, 5 to 10 page reports, and documentation such as test reports and specifications. Teams of students did the large papers so there were 11 rather than 45 papers. What I found most valuable was the feedback from my teaching assistants. Sometimes he did not understand the question or disagreed with my answer. This gave me new insight into the students' viewpoint. When grading the models and papers, the teaching assistant could clearly see the quality

difference. In addition, I would select papers that I expected were well done for him to read.

The one change I would make to model of the two-person grading team is moving the grading site out of my office. In my office I was often interrupted and called away from the grading task.

Teaching Assistant Survey

I sent a blind survey to the teaching assistants who have worked for me over the past two years. Figure 1 shows the questionnaire and results. The numbers in the blanks are the number of responses in that category. I sent out 8 questionnaires and received 6 replies. The forms were sent by email and the email returns were directed to the Department secretary who printed out the survey answers for me.

The survey is not statistically significant because of the small sample size but it does point to several trends. First, in questions 3 and 4, the teaching assistants were asked if they prefer working with students or grading. All six prefer working with students. This indicates to me that my teaching assistants are normal people who prefer to work with people.

In question 5 the teaching assistants said they preferred grading questions with one clean-cut answer rather than more open-ended questions. I expect we all agree. It is easier to have one clear answer but unfortunately questions with only one right answer become less common as we move on in a computer science curriculum.

Questions 6 and 7 address the quality of grading first from the teaching assistants' viewpoint and then how the teaching assistants believe the students perceive the quality. The teaching assistants believe their own work is 50% very good, 41% good, and 3% fair. They believe the students view their work as 50% very good, 47% good, and 3% fair. One conclusion is that the teaching assistants believe they do a better job than they believe students think they do.

Question 6b asked about the feedback grader supply students. The graders were not particularly happy with the feedback they provided. As the instructor I did not specify feedback and, from this questionnaire, I believe this is an area where I could improve grading.

Question 8 asked about preference for team grading versus individual grading. One person said that they did not like individual grading, but everyone else said both team grading and individual grading were either good or fine. Five said team grading was good, and one said individual grading was good. The fixed time for team grading received 3 goods and 3 fines. This was the most negative response for team grading.

Although the survey does not give statistically significant results, it does show us a pattern of preference for team grading. The teaching assistants believe they are doing high quality work and probably the biggest drawback is the fixed time.

1. How much team grading have you done? 4 Lots 2 Some 0 None
2. How much traditional grading have you done? 2 Lots 1 Some 3 None
3. What is your favorite part of your TA job?
 - 6 Working one-on-one with students
 - 0 Grading quizzes or tests
 - 0 Grading homework
4. What is your **least** favorite part of your TA job?
 - 0 Working one-on-one with students
 - 3 Grading quizzes or tests
 - 3 Grading homework
5. What is your favorite type of questions to grade?
 - 5 Questions with exact answers
 - 1 Questions with a range of correct answers
 - 0 Questions that you have to decide if the answers is correct because there is not a clear answer
6. From your view point as a Teaching Assistant doing team grading, what is your satisfaction level with the following:
 - a. Paper return time to students 5 Very Good 1 Good ___ Fair ___ Poor
 - b. Feedback on papers 2 Very Good 3 Good 1 Fair ___ Poor
 - c. Feedback from professor while grading 3 Very Good 3 Good ___ Fair ___ Poor
 - d. Freedom to grade as you see fit 4 Very Good 2 Good ___ Fair ___ Poor
 - e. Quality of the grading 3 Very Good 3 Good ___ Fair ___ Poor
 - f. Consistency of the grading 3 Very Good 3 Good ___ Fair ___ Poor
7. Put yourself in the position of the students in the course you are grading for. What is your satisfaction level with the following?
 - a. Consistency of grading 2 Very Good 4 Good ___ Fair ___ Poor
 - b. Completeness of grading 3 Very Good 3 Good ___ Fair ___ Poor
 - c. Quality of feedback 3 Very Good 3 Good ___ Fair ___ Poor
 - d. Time HWs and quizzes are returned 5 Very Good 1 Good ___ Fair ___ Poor
 - e. Fairness of grading 2 Very Good 3 Good 1 Fair ___ Poor
8. Team grading has characteristics. Some we like, some we don't. Mark the following according to the degree of "goodness" for you.
 - a. Team grading approach 5 Good 1 Fine ___ Not my favorite
 - b. Individual grading approach 1 Good 4 Fine 1 Not my favorite
 - c. Fixed time for grading 3 Good 3 Fine ___ Not my favorite
 - d. Social aspects of team grading 4 Good 2 Fine ___ Not my favorite
 - e. Feedback **to** professor while grading 5 Good 1 Fine ___ Not my favorite
 - f. Feedback **from** professor while grading 5 Good 1 Fine ___ Not my favorite

Figure 1: Survey and Results

Observations

1. My teaching assistants have been very strict graders. Along with the key, I give them the amount to deduct for each error. When they find other types of errors, they are willing to deduct more than I am. Only infrequently have I seen the overly generous grading decisions from my teaching assistants.
2. My teaching assistants have been very effective in finding duplicate programming assignments. Although I encourage students to talk about programming assignments, I insist that they do their own programming. My teaching assistants seem to be able to spot duplicates with uncanny accuracy. Because they are students who have worked hard to get where they are, they strongly dislike cheating and have no mercy for cheaters.

Conclusion

I suggest team grading whenever you have a teaching assistant. Even if you have just one teaching assistant I believe it is better to work with them rather than just handing them a pile of papers and expecting high-quality grading. The team grading approach makes grading more pleasant for the teaching assistant because they really get to know their professors. Also, because the professor is there, the teaching assistant can be more assured of making acceptable grading decisions. In addition, the professor can get immediate feedback from the grader and timeliness is assured if grading is done on a predefined schedule.