Best Practices for Grading Laboratory Reports

Adapted from Black, Gach, & Kotzian (1996)

Most laboratory classes include some form of graded report that is generated by the students to summarize their work. Having students write up a lab serves several purposes. First, producing a report gives students the opportunity to collect their observations and interpretations into a cohesive and coherent format. Second, it helps students prepare for their future careers, illustrating the process of conducting research and documenting results. Some classes have students just turn in the analyzed results from their collected data. Other classes have students present oral reports of their data, analyzed findings, and implications. In other classes, students conduct individual research projects where they design and report out their original results. With any of these approaches, it is import to be clear about the assignment expectations (using checklists or assignment descriptions) and to provide consistency for how the work is graded (using some form of grading sheet like a rubric). This section will address grading issues specific to the laboratory classroom. For more information on grading, see Part 8, "Best Practices for Designing and Grading Exams" on page 132 in the GSI guidebook.

> *GSI Tip: Provide specific feedback that is targeted towards the areas that will lead to the most significant improvements. This is the students' best opportunity to learn from their mistakes. Post an annotated key to explain correct answers, or take the time to write thorough comments on each paper.*

The following suggestions should help make the grading of lab reports easier:

- *Lay out grading criteria clearly and in advance.* A **written** statement clarifying what an "A" lab is, what a "B" lab is, and so on can outline teacher expectations for the students. It can also serve as a useful reference tool should a student have a question about a grade received. Likewise, policies on late lab reports should be written down and handed out at the beginning of the term. Again, this reduces possible misunderstandings and allows for easier decision-making during the term.

- *Determine your policy for lateness.* Some policies for lateness have included: no late reports accepted, late reports accepted only with valid excuse, late reports accepted with grade reduction penalty, and one late lab accepted without penalty during the term. Check with the professor of the course to see if there is a standard late policy for the sections. If there isn't, choose one that fits with your philosophy and apply it consistently throughout the term. When determining your late policy, you should also pay attention to when labs are due. If you are setting due dates that are difficult for students to meet, then you will probably have more late lab situations to address.

- *When grading lab reports, read through several before making any comments or determining scores.* This allows you to form a baseline impression for the class before grading individual reports. It also helps to form a checklist of criteria that you can refer to when grading, to ensure consistency in your marks, and to give students a specific understanding of what you are looking for in that report. Find out if there is a course-wide checklist for grading each lab to promote consistency across labs.

- *When developing your criteria, decide how heavily you will weigh content versus form.* Content refers to the substance of the report: data, results, interpretations, conclusions. Form refers to how the substance is presented: organization of material, graphs and tables, clarity of writing, and grammatical correctness of sentences. Many courses have a standard format which students should follow in doing their write-ups. Again, check with the course professor to develop a clear understanding of grading criteria for reports. It also helps to check with other GSIs teaching the same course, or with those who have taught it previously.

- *Grade on thoughtful analysis, not on success at "getting the right answer."* As with "real" science, not all labs will work out successfully for students. In many labs, the report will not be graded on the success of the results, but on the students' interpretation of their results. Thus, students who do not get the desired results from an experiment, but make a thoughtful analysis of why or of what should have occurred, would not be penalized in their write-ups. Evidence of good interpretation or analysis involves identification of patterns or contradictions and a specific, plausible, and well-supported explanation for these results.

- *Give useful and prompt feedback to students.* In addition to determining a grade for the report, your role as a GSI involves giving useful feedback to students. You should make comments on lab reports and return them with sufficient time for students to learn from the comments before turning in their next report. When providing feedback, consider describing difficulties that you experienced when reading the report or using questions to stimulate student reflection. For example a comment such as "Could there be another explanation for why your value is higher than

expected?" is more productive than a statement such as "Not complete." Also, when providing feedback, try not to overwhelm the student. Too many comments on a page can be daunting to a student who wants to improve. Instead, pinpoint a few key issues for each report. By spending extra time to provide prompt feedback and thoroughly grade the first assignment, you will greatly ease the grading process for the latter part of the semester. For best practices on grading student writing see "Responding to Student Writing–Principles and Practices" on page 136.

- *Learning to grade is an ongoing process.* As you gain experience as a GSI, you will develop new methods and systems for grading, and you will constantly fine-tune your processes. Sharing grading issues and ideas with peers can help you in this process. If in doubt on a grading issue, consult the appropriate senior personnel. It is difficult to alter grades once they are assigned.

Reference

Black, B., Gach, M., & Kotzian, N. (1996). *Guidebook for teaching labs for University of Michigan Graduate Student Instructors*. Ann Arbor, MI: Center for Research on Learning and Teaching, University of Michigan.