Peer-Evaluation Techniques:
Classroom Strategies for Editing and Improving Student Work

Alison E. Feeney
Shippensburg University
aefeen@ship.edu

INTRODUCTION

STUDENTS LEARN IMPORTANT cartographic design principles when they are able to think critically and actively engage in map design evaluations. Having students critique their peers' maps can be a useful teaching technique, reinforcing a student's own learning by prompting them to assist and instruct others. I employ two strategies in the classroom to generate peer evaluations that do not take too much time, yet have a big impact on student projects. First, I try to keep them fun and brief, yet focused and directed. Second, I ensure all feedback is student-driven: students tend to share similar technical terms, jargon, and knowledge that put them on an equal level of understanding, as compared to the specialized comments often used by faculty members. I find students generally feel less intimidated by feedback from other students than from a professor.

Student maps improve greatly and learning outcomes are more often achieved when students are required to revise and edit their assignments. However, grading weekly lab assignments limits an instructor's ability to provide immediate feedback to students on their maps. Much of the time grading these assignments is spent on initial observations about overall design and balance, hierarchy of information, proper symbol choice, clarity of information, and the dreaded overbearing north arrow, rather than more detailed comments about position of text, variations in color saturation, or even grammatical written errors. Editorial remarks are usually given back to students a few days later in the next class period. Despite presenting the class with overall comments, examples of good and bad work, and encouragement to improve their maps, the majority of students rarely touch an assignment after it has been graded and returned. I have found peer-evaluations are an effective way to overcome these problems in my cartography course.

GEO 352: CARTOGRAPHY

I TEACH A 300-level course titled "Cartography," which is mostly comprised of sophomore and junior undergraduate students. The majority of students are geo-environmental majors and select cartography as one option out of a group of required technique courses including GIS II, Remote Sensing, Quantitative Methods, and Field Methods. The course is capped at 20 students, limited by the number of computers in the lab. It is taught in a computer lab twice a week for an hour and fifteen minutes. I begin the class time with a 20–25 minutes lecture, followed by 10 minutes of demonstration of an applied computer skill, and then individual work on hands-on assignments. Despite the course not having any pre-requisites, the students are highly advised to have completed GIS I, so that they have a basic understanding of ArcGIS and some fundamental concepts of representing features in a spatial context. Many of the activities build on their ArcGIS knowledge, while developing new skills in a graphic design package such as Adobe Illustrator.

During the course of a semester, I stress the development of effective graphic communication through both short- and long-term projects. Ten weekly assignments allow students to gain skills in ArcGIS and export their maps into

Illustrator to enhance and present concepts. For example, in one activity students select a single socio-demographic variable from one state and classify the county-level data using three different methods (Jenks, equal interval, and quantile). They are then asked to display all three methods in a one-page infographic that includes the resulting maps and information such as where breaks occur and the number of observations in each category. Students can present the results in writing, but they are encouraged to explain their work visually in diagrams, graphs, or charts.

Semester-long projects have more variation, with individual students mapping different topics, with their selection guided by real world needs based on requests from organizations. For example, recent projects have focused on an educational brochure about stream restoration, Pennsylvania DCNR online camping reservations, and NOAA's Flower Garden Banks Marine Sanctuary. Their final project should include a large-scale map, a regional locator map, scientific data that may be presented in charts or graphs, photographs, diagrams, and a range of text, amongst other items they feel are relevant. By the end of the semester, students should have several high quality maps from both short- and long-term projects that demonstrate their ability to collect, manage, organize, and display spatial data in both GIS and graphic design programs, and which are worthy of keeping in a portfolio for potential employers.

APPROACH TO PEER-REVIEW

Evaluations of short weekly activities benefit from quick, brief peer-review comments. By combining relatable elements of pop culture with recently learned class concepts, students receive feedback on their own work and gain skills in map reading by critiquing others. Taking a cue from the latest craze in fitness watches, after students have been working a while, I tell them to save their work, for it is time to stand. Students walk around the room looking at each project for 15–20 seconds. We stress the slogan students know from the influx of new Planet Fitness facilities in their area: that the classroom is a "Judgment Free Zone." With only a few minutes of class time used in this activity, a quiet lab setting becomes a room of discussion where students can laugh at mistakes, see fresh ideas, and freely shout out things they like and didn't like. Occasionally, if students need more than just several seconds of glancing at ideas, and the projects would benefit from a few written peer-review comments, we do the Cha Cha Slide. Again, after saving their work, students stand and are directed to "take a step to the left, three steps to the right, clap their hands, and take it back now y'all." While not trying to torture students with my poor singing voice, I change my directions and number of steps to create an unpredictable way to have them stop and sit at just one or two computers. While in front of that computer they need to provide written feedback on a specific topic or particular concept pertaining to that assignment.

The semester-long projects benefit from multiple edits with guided criticism. Students are warned a week or two in advance of evaluation days. On those days, students have a few minutes to open their work, make any changes, and save their files. I give each student a piece of paper with topics pertaining to their map, and a dividing line between "Needs Improvement" and "Looks Good" as seen in Table 1. This paper remains in front of each computer. Students are encouraged to take their own pen to avoid spreading too many germs as they move around the room. After a minute or two, I yell, "switch," and they move along to the next computer. The directed topics may change as the semester goes along, but each time students can make comments on what is good about the map and what they may find confusing or distracting. They can draw suggestions of other images or graphs that might make the project more interesting, and they can elaborate on someone else's comments. Within twenty to thirty minutes every project has a wealth of suggestions.

An example of the evaluation process comes from a student's map of the Gulf of Mexico that included a food-chain ecosystem diagram, pictures of animals, and their mapped habitats. The concept was good but the overall design was not clear. Comments offered by students include phrases such as "the text on your animal wheel is a little too small," "maybe clearer text, a larger font, and stronger arrows would clarify that these animals are connected in an ecosystem," and, "the wheel of the animals stands out but the maps of where they live are too small and aren't noticeable," and helped this student reorganize his topic. The result was a clearly labeled wheel, with distinct maps of each habitat and a related picture of each animal.

	Needs Improvement	Looks Good
Overall Layout and Balance		
The Main Map		
Inset		
Charts/Graphs/Pictures		
Color		
Supporting Text Blocks		

Table 1. *A peer-review example page.*

Ideally, as the semester progresses and improvements are made, the dividing line between the good and bad map qualities on the paper shifts. Initially, the greatest improvement comes from the student's use of space and what I refer to as a "brain dump." On the first draft, most students tend to put everything on the page with little thought of organization or overall balance. The initial map drafts will tend to have a lot of unused space, unnecessary written information, and randomly placed objects such as north arrows, insets, and pictures, all of which create disjointed and distracting projects. During the first peer evaluation, these students receive repeated comments from multiple students about their use of space; these comments, along with their own critical observations of other projects, prompt students to make significant improvements to their overall presentation of information. With a better layout, the succeeding evaluation days tend to focus on critique of appropriate methods of displaying data, and creative designs.

ASSESSMENT OF PEER-REVIEWED RESULTS

STUDENTS ARE REQUIRED to hand in these evaluation sheets alongside their final project, and they are assessed as part of the final project grade. First, the collection of evaluation sheets demonstrates the level to which a student edited their own work. If the same comments are repeated on multiple evaluation days, clearly the student did not understand the concept or they chose not to make improvements. Second, students are encouraged to place their initials after their written comments on the evaluation sheets. I use their collective comments as part of a participation grade. I do not expect them to provide elaborate insights into every student's project, especially if they are the 20th person to evaluate the map, but simply writing "nice map," "cool pictures," or "I like the blue background" on every paper does not constitute an acceptable level of active participation.

CONCLUDING THOUGHTS

BESIDES HELPING STUDENTS LEARN about map design, these peer-review techniques also aid in several significant and substantial classroom management issues. First, there is a noticeable lack of excuses for not having work completed. Typically, students do not make the sort of excuses to other students that faculty commonly hear, such as family emergencies, lost storage devices, and forgotten homework. Additionally, peer-evaluation days make students start projects earlier, rather than leave assignments to last minute. Generally, one or two students will not have their assignments for the first evaluation day, but they can still participate in providing feedback to others, and they make sure not to have that experience happen again. Second is the minor adjustments or corrections to assignments. Despite clearly written instructions and learning objectives, undoubtedly someone will not follow directions. The time-to-stand activity allows those students to identify their mistakes and provides those who do

not quite understand the assignment a chance to ask questions. It gives everyone the opportunity to see a variety of ideas before the class period is over, while still leaving time to make adjustments. Third, any sign of plagiarism, cheating, or blatant lack of effort is handled immediately upfront. Taken from an ESPN *Monday Night Football* segment that makes fun of the worst plays of the weekend, the class has started "C'mon Man" to highlight any sub-par effort. In a fun, joking manner in the judgment-free zone, students love to yell out "C'mon Man," which results in the identified student improving their assignment by the next class period. Finally, these activities create a team-building atmosphere. The supportive relationships that develop extend to all projects and students feel more confident in assisting other students and working together to solve problems, and overall, they gain a more satisfied feeling of achievement.

In summary, while the students' projects still range in quality following these edits and classroom techniques, the peer-evaluations force students to improve their map reading skills, and chances are that if they have examined, evaluated, and critiqued design concepts of their fellow students' work, they will make similar edits and improvements to their own maps.