Poster Review held in a classroom 1999.

Poster Project Final: Student Performance and Perception

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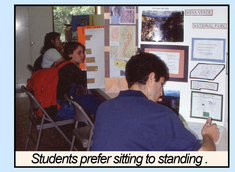


Students prefer sitting to standing.

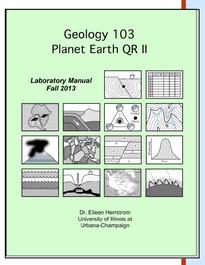
1. Description of the Course

Planet Earth QR II: Introductory physical geology course intended for students who are not science majors.

- Satisfies two general education requirements
  - Physical Science
  - Quantitative Reasoning: students learn to use spreadsheet software to handle large data sets and to create graphs

Former Grading Distribution

- 70% based on examinations
  - Two midterm exams and a comprehensive final
- 30% for lab work
  - 15 laboratory exercises



Changes were introduced to reduce emphasis on exams, because both pedagogical research and personal observation had shown that not all students test well.

Current Grading Distribution

- 33% based on examinations
  - Three midterm exams
- 30% for lab work
  - 14 weekly laboratory exercises
- 24% for term project
- 13% for other assignments

2. The Poster Project

This project is modeled after scientific meetings. The challenge is to present varied and interesting data accurately and attractively in a concise format.

Students find a data set online, graph some aspect of the data, and summarize the results. No oral presentation is involved. Posters are graded on their geological content, use of a spreadsheet, use of graphics, and organization.

Projects utilize a standard sheet of posterboard measuring 56 x 71 cm (22 x 28 in), so space is restricted. Every poster must incorporate the following elements:

- Informative title
- Table with at least 50 data points, formatted and printed using a spreadsheet program
- Graph created using a spreadsheet program
- A 1-page summary of the overall project
- At least one picture and one map
- Three or more references

Intermediate deadlines throughout the semester:

- Topic and data source
- Table and graph
- Summary
- References

Short quizzes to illustrate best practices in poster-making were added, after several semesters when students omitted basic features, such as figure numbers and captions. Formatting of posters improved with these lessons.

Review Session: During the scheduled final exam time, students read five posters and answer a series of questions about each one. Reviews affect the grade of the reviewer, but they do not affect the grades assigned to the posters.

Grades for the Poster Project are based on:

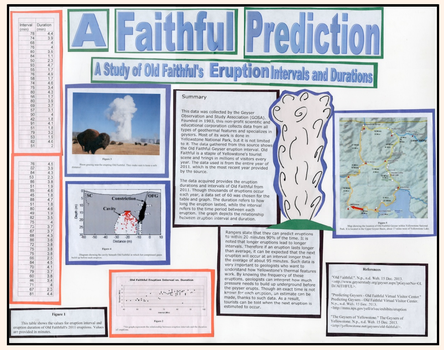
- Ten project sample quizzes
- Four intermediate assignments
- The poster itself
- Five poster reviews

3. Topics

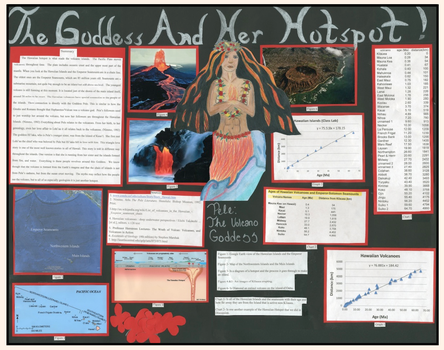
- Seismic Activity in: Illinois, Guam, Fiji, Yellowstone
- New Madrid Seismic Zone
- 2010 Chilean Earthquake and Tsunami
- Gauge Height of the Sangamon River
- River Flow and Chloride Concentration
- Composition of Meteorites
- Receding Arctic Ice
- Temperature Anomalies in the Northern Hemisphere
- US Production of Coal
- Myth-Busting: Seattle Rainiest City in the United States?
- The Great Chicago Blizzard of 1967
- The Mariana Trench
- Midwest Seasonal Rainfall Distribution 1961 - 1990
- The Front Line of Sea Level Rise: Key West, Florida
- Comparing Colleges' and Universities' Carbon Footprints

Earthquake magnitude vs. deaths is one of the most popular topics, because the data are easy to find.

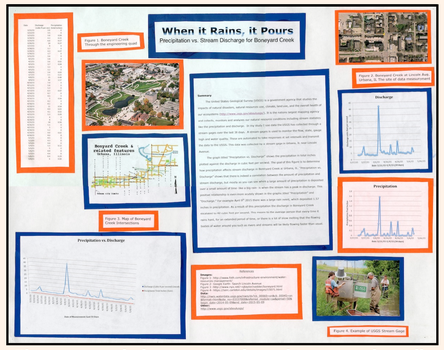
4. Examples Scanned from Physical Posters



All the required elements are present on this poster, but they are not well organized.

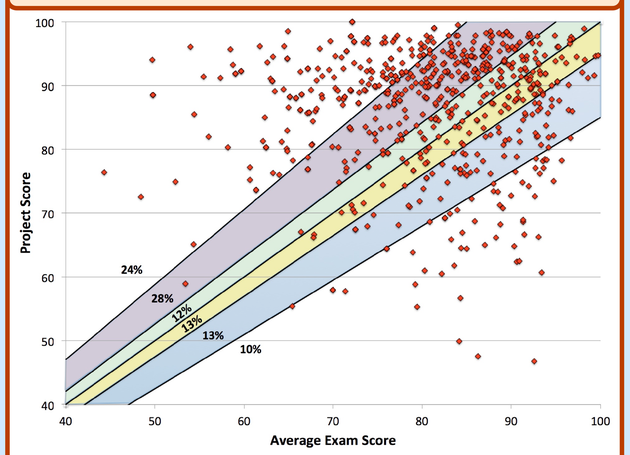


Here is a creative and complete poster, but its summary discusses folklore rather than the data and graph.



This poster includes extra graphs and images and a well-written summary, but the pieces are uneven.

5. Comparison of Scores



Course Statistics

- Nine semesters
- 621 students finished the course:
  - Took all three exams
  - Completed the Poster Project

Poster Review held in the Union 2015.

This chart plots projects against exam grades.

Shading represents:

- Purple: **P**roject score - **E**xam average = 5 to 15
- Green: P - E = 0 to 5
- Yellow: P - E = -5 to 0
- Blue: P - E = -5 to -15

White and shaded areas are labeled with the percentage of points plotting in that area.

Results

- Just over half scored significantly better on the poster than on the exams (upper white triangle + purple area = 52%).
- One quarter of project scores were within 5 points of exam averages, showing no significant difference (green + yellow areas = 25%).
- Slightly less than one quarter scored significantly better on the exams than on the project (blue area + lower white triangle = 23%).

One objective in replacing the final exam with a project was to help students who do not perform well on tests. That 64% scored better on the project than on exams suggests this change was successful.

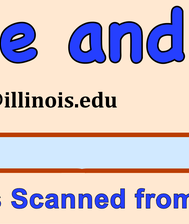
Most of the students who performed more than 5% worse on the poster than on exams had not completed all required parts of the project.

6. Representative Comments

The Project Evaluation is a brief questionnaire that students may opt to complete at the end of the Poster Session. This section presents a few noteworthy comments. Numbers in parentheses are percentages of people making that comment.

1.a. What did you like about preparing your own poster?

Choosing my own topic (15%)
Going further in depth on a topic I'm interested in (9%)
Understanding my data was the best part. (11%)
I felt like a true geologist and researcher. (5%)
Hands-on work (7%)
Having the opportunity to showcase my creative side (20%)



Students review posters.

b. What did you dislike about it?

I'm not very artistic or creative. (6%)
Cutting straight lines has never been a strong suit of mine. (11%)
Finding 50 data points (15%)
I disproved my hypothesis. (1%)
Using Excel for the graphs and data table (8%)
Nothing (23%)

2.a. What did you like about reviewing other students' posters?

Seeing what topics others chose (24%)
Seeing the way everyone else designed their posterboard (16%)
Comparing theirs to mine (12%)
I learned some intriguing facts about geological topics. (30%)
It gave me ideas for future presentation strategies. (11%)
Very relaxed atmosphere (10%)

b. What did you dislike about it?

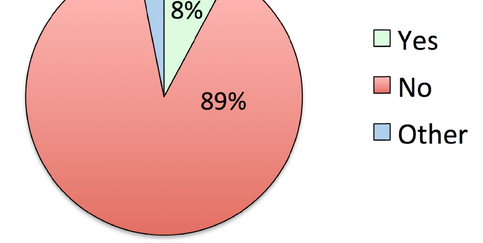
Having to be critical about others' work (13%)
That I didn't have time to read them all! (4%)
Theirs are better than mine. (7%)
It was a little boring and tedious. (11%)
Standing up and writing (10%)
Nothing (27%)

Some tables are provided.

3. Would you have preferred a comprehensive final exam similar in format to the midterms? (Midterm exams comprised half multiple choice questions and half short answer/essay questions, plus extra credit.)

Answers ranged from *Yes* to *Maybe* to *No* to *Definitely not!* to *Hell no!*
See the breakdown in Section 7.

7. Student Preferences



Question 3 of the Project Evaluation asks for opinions regarding the Poster Project vs. a comprehensive (cumulative) final examination. The vast majority of students prefer the project. Fewer than 10% would rather have a final exam. The blue slice labeled "Other" represents those who expressed no opinion or gave indeterminate answers.

This graph shows that 89% of students prefer the project to an exam, while the graph in section 5 indicates that only 64% scored better on the project than on the exams. Thus, there is a group of students who liked the project better than the exams and yet would probably have received a higher grade on a written final examination.

8. Conclusions

1. The majority of students perform better on the project than on exams, so the project is providing an avenue for students who test poorly to improve their grades.
2. Students much prefer doing the Poster Project to the idea of taking a comprehensive (cumulative) final exam.
3. The Poster Project provides an opportunity for students to study a topic in depth and to showcase their creativity in a graded activity.