**Evaluation of Criterion in the Scientific Writing (Bio Sci 100) and Neurobiology Lab (Bio Sci N113) courses during the 2011 Winter Quarter**

**Summary**

<u>**Number of Students**</u>
**Scientific Writing (Bio Sci 100)**
The number of student in the class was 524.
The number of students that took the online survey was 417.

**Neurobiology Lab (Bio Sci N113)**
The number of student in the class was 178.
Survey questions were designed but were not included in a class survey.

<u>**Assignments**</u>
**Scientific Writing (Bio Sci 100)**
Three assignments required students to use Criterion Online Writing Evaluation Service
1. A Material and Methods section writing assignment
    The Material and Methods section writing assignment was done as a in class group project

2. An Introduction and an Experimental Design writing assignment
3. A compare/contrast of six chapters in a book and a journal article

**Neurobiology Lab (Bio Sci N113)**
The students were required to use Criterion for their first lab report.
The use of Criterion for the second lab report was optional.


# Results

**Usage of Criterion Program**

**Neurobiology Lab (Bio Sci N113)**

<u>Lab Report 1</u>

|  | Number of Students | Percentage of Students |
|---|---|---|
| Submitted & Revised report in Criterion | 83 | 47% |
| Only 1 submission to Criterion (Student may or may not have revise their lab report based on Criterion's Feedback Analysis) | 63 | 35% |
| First & last submission were identical | 12 | 7% |
| Did not use Criterion | 20 | 11% |

<u>Lab Report 2 (Optional</u>

| | Number of Students | Percentage of Students |
|---|---|---|
| Submitted & Revised report in Criterion | 46 | 26% |
| Only 1 submission to Criterion (Student may or may not have revise their lab report based on Criterion's Feedback Analysis) | 72 | 40% |
| Did not use Criterion | 60 | 34% |

*Waiting for the grades of the lab reports to compare grade of report to usage of Criterion

## Scientific Writing (Bio Sci 100)

## <u>Introduction and an Experimental Design writing assignment</u>

| | Number of Students | Percentage of Students |
|---|---|---|
| Submitted & Revised report in Criterion | 415 | 79% |
| Only 1 submission to Criterion (Student may or may not have revise their lab report based on Criterion's Feedback Analysis) | 101 | 19% |
| Did not use Criterion | 8 | 1% |

## <u>Compare/contrast of six chapters in a book and a journal article</u>

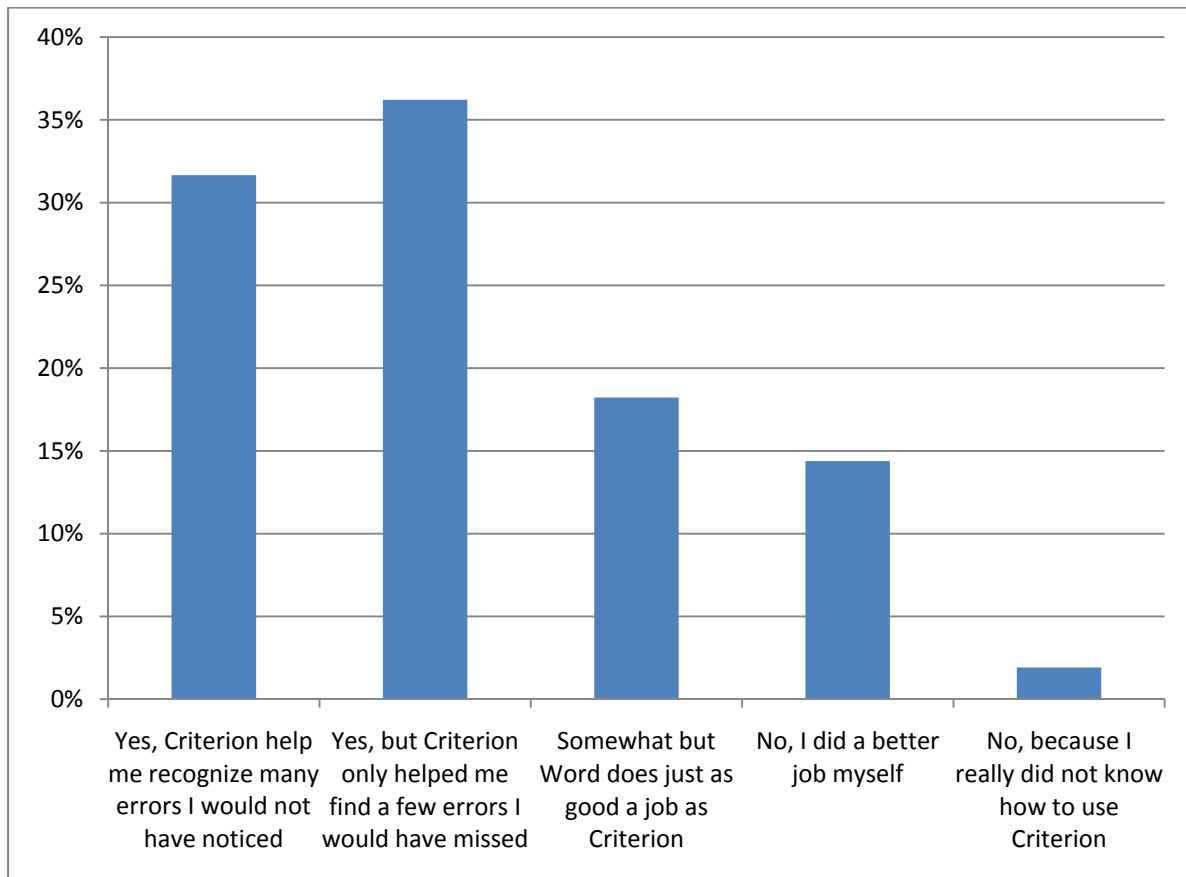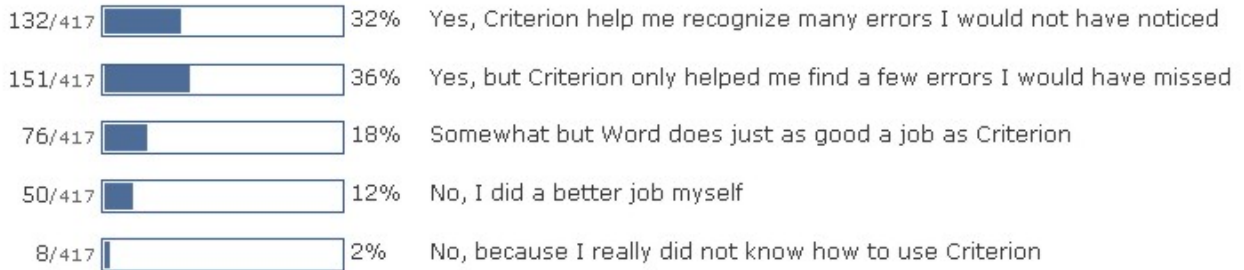| | Number of Students | Percentage of Students |
|---|---|---|
| Submitted & Revised report in Criterion | 486 | 89% |
| Only 1 submission to Criterion (Student may or may not have revise their lab report based on Criterion's Feedback Analysis) | 41 | 8% |
| Did not use Criterion | 17 | 3% |

## Results of Survey
Bio100 Survey-Winter 2011 (80% participation)

## EEE Survey Question:
## Did using Criterion help you with proof reading your writing?

EEE Survey Results: Did using Criterion help you with proof reading your writing?

| | | |
|---|---|---|
| 132/417 | 32% | Yes, Criterion help me recognize many errors I would not have noticed |
| 151/417 | 36% | Yes, but Criterion only helped me find a few errors I would have missed |
| 76/417 | 18% | Somewhat but Word does just as good a job as Criterion |
| 50/417 | 12% | No, I did a better job myself |
| 8/417 | 2% | No, because I really did not know how to use Criterion |

EEE Survey Question: Did using Criterion help you with proof reading your writing?
<u>Breakdown by response and final grade in Class</u>

|  |  |  |  |  |  | Grade Student Received | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Response to Question of Did using Criterion help you with proofreading your writing? | Number of students with response | % | A+ | A | A- | A+, A, A- | B+ | B | B- | B+, B, B- | C+ | C | C- | C+, C, C- | D, F |
| Yes, Criterion help me recognize many errors I would not have noticed | 132 | 32% | 9 | 7 | 14 | **30** | 24 | 18 | 22 | **64** | 15 | 8 | 5 | **28** | **10** |
| Yes, but Criterion only helped me find a few errors I would have missed | 151 | 36% | 8 | 14 | 28 | **50** | 32 | 17 | 23 | **72** | 6 | 6 | 7 | **19** | **10** |
| Somewhat but Word does just as good a job as Criterion | 76 | 18% | 2 | 6 | 8 | **16** | 6 | 17 | 8 | **31** | 9 | 8 | 3 | **20** | **9** |
| No, I did a better job myself | 50 | 12% | 3 | 6 | 5 | **14** | 5 | 10 | 6 | **21** | 6 | 3 | 3 | **12** | **3** |
| No, because I really did not know how to use Criterion | 8 | 2% |  |  |  | **0** |  |  | 1 | **1** | 3 | 2 |  | **5** | **2** |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Overall Class | 417 |  | 22 | 33 | 55 | 110 | 67 | 62 | 60 | 189 | 39 | 27 | 18 | 84 | 34 |

**Graphic Representation of Comparison of Grade and Student Response**
The students that responded with the answer that they could do a better job themselves did not have a better grade than the students that felt Criterion helped them identify errors. Students who did not understand how to use Criterion had a lower grade class.
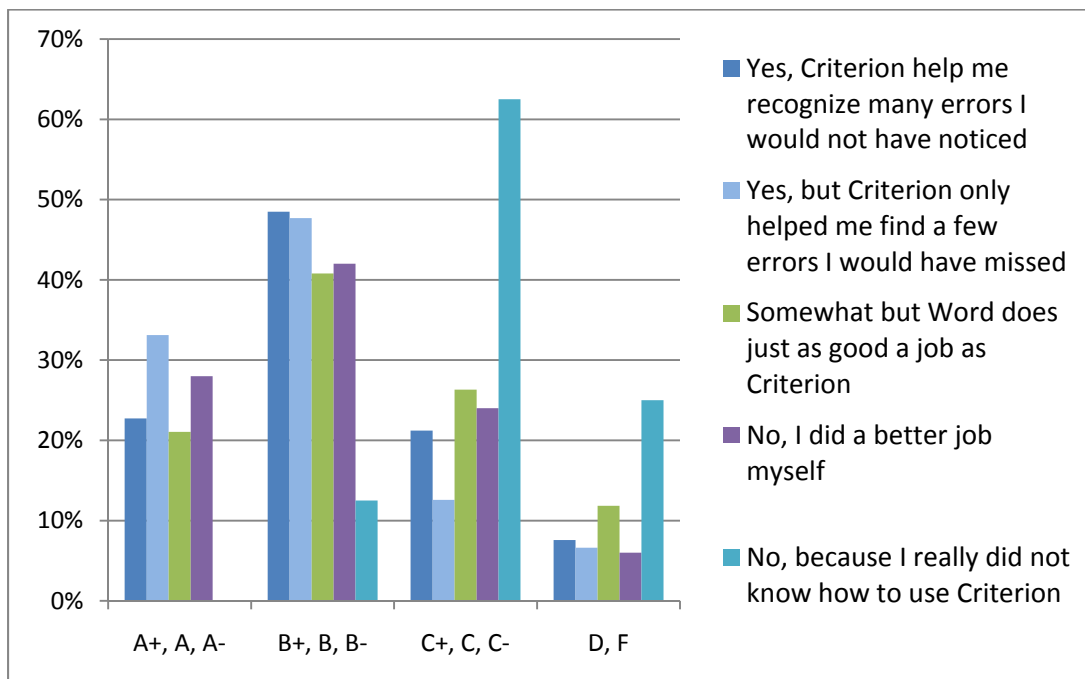
Students were asked to support their answer to the question: *Did using Criterion help you with proofreading your writing?*

About 35 % of the students who answered negatively (No, I did a better job myself) and submitted a comment (30/50) were unhappy with Criterion recognizing errors that were not errors.  Criterion's algorithm has problems with test citations, headings and references. Student comment: "*Criterion highlighted many things that didn't need to be highlighted like references and what not". It made the paper look worse that it really was*".  About 10% of the students just felt that the program was a waste of their money. Student comment: "*I hated using Criterion. For me, it was a waste of time and $13. I'm a better proofreader than Criterion.*"

Students who felt the program was helpful had a wide variety of reasons why they liked the program.  Some of the more common reasons can be seen in the following comments by students.

*"Criterion seemed to help me clarify statements in my paper, by re-analyzing my statements."*

*"I could never get my grammar right, even if it meant saving my life. Criterion would help me correct when to use the words "than" and "then". Criterion helped me in writing my 6 page anthropology essay. It also recognized any awkward, short, or long sentences. Not only that, but it was nice that it would recognize words that you kept on using. It's an impressive tool compared to 'spell check' on Microsoft Word."*

*"I always have problem with run-on sentences and verb-tense agreement. I was able to reduce these errors drastically with the help of criterion."*
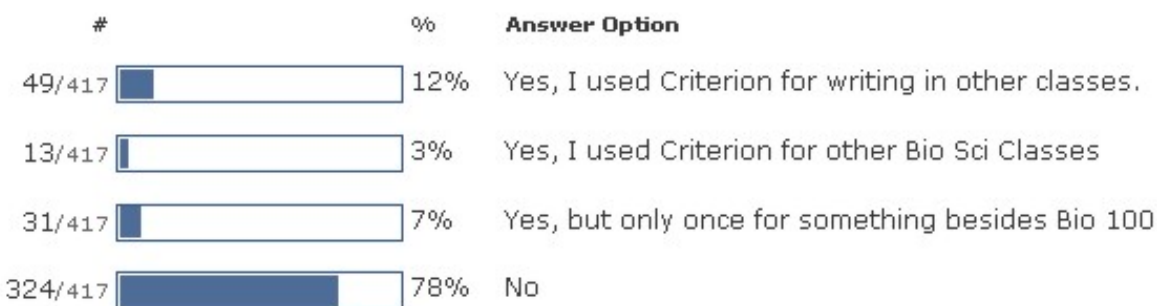
*"I liked how Criterion analyzed my sentence structures and took noticed of any repetitive words."*

*"It made me realize how many times I use incomplete sentences."*

*"Many times I found myself using passive voice where it wasn't needed. It also was very helpful for determining run-on sentences and many short sentences in a row."*

*"There were some sentence structures that I didn't notice weren't making sense and criterion pointed it out for me."*

EEE Survey Results: Did you use Criterion for any writing outside of Bio 100 assignments?

| # | % | Answer Option |
|---|---|---|
| 49/417 | 12% | Yes, I used Criterion for writing in other classes. |
| 13/417 | 3% | Yes, I used Criterion for other Bio Sci Classes |
| 31/417 | 7% | Yes, but only once for something besides Bio 100 |
| 324/417 | 78% | No |

Optional folders were created in Criterion to allow students the opportunity to use Criterion for other writing assignments or personal use.

2 Students in Bio Sci N113L used the optional folders
195 (37%) students in Bio Sci 100 used the optional folders.
66% (129/195 student) submitted more than 3 different assignments to the folders

Students submitted writing for revision for other classes in Bio Sci
    BioSci 199 Independent Research
    BioSci D145 (Proteonomics and Genomics)
    BioSci E112L (Physiology lab)
    BioSci M114L (Biochemistry Lab)
    BioSci M118 (Experimental Microbiology Lab)
    BioSci N113L (Neurobiology lab)

Students submitted writing for revision for other classes not in Bio Sci
    Anthro 136K
    Anthro 2A
    Anthroplogy 50B
    Anthropology 2a
    Art History 40B
    Asian American Studies
    BME 121
    Cancer paper
    Chem 128
    EALL Premodern to Modern Japan - book reports
    Education 50
    History 152
    History 21B
    History 40B
    International Studies Final Paper
    Medicinal chemistry lab.
    MGMT 10
    Psych 7A
    Public Health 120
    Public Health 198

Students submitted writing for revision not were not required in another class
    Essays for scholarships
    Just to proof read a small speech.
    Personal e-mails.
    Personal essay
    Personal Statement

Students who used Criterion for other classes appeared to be very happy with the introduction of the program to the course and wished that the program had been available earlier in their career. Two comments from the survey about using Criterion beyond the Bio 100 course.

> *"I plan on using to help me monitor my writing in general."*

> *"Yes, I loved using this for my other classes! I used it for so many essays it was crazy! :)"*
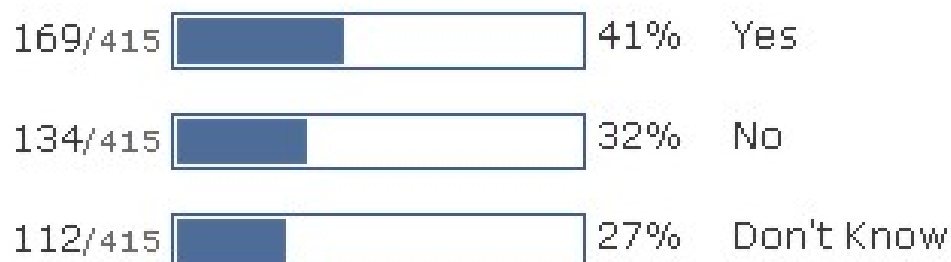
EEE Survey Results: Who normally helps you proofread your writing?

| | | |
|---|---|---|
| 211/417 | 51% | No one, I proof read my own writing |
| 181/417 | 43% | friends |
| 16/417 | 4% | Library peer tutors |
| 9/417 | 2% | LARC |

EEE Survey Results: Would you still use Criterion if it was not required for a class?

| | | |
|---|---|---|
| 115/416 | 28% | Yes |
| 144/416 | 35% | No |
| 157/416 | 38% | Maybe |
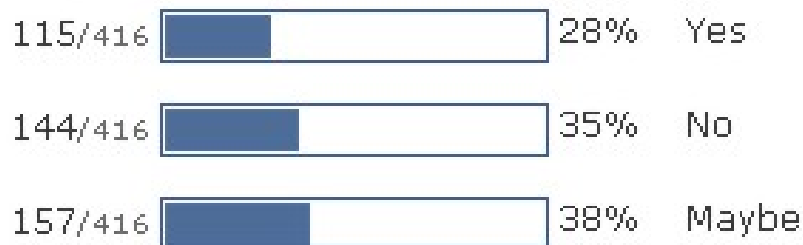
Would you recommend Criterion to other student?

| | | |
|---|---|---|
| 169/415 | 41% | Yes |
| 134/415 | 32% | No |
| 112/415 | 27% | Don't Know |

**Conclusions**

For Criterion to be effective, students need more than a brief introduction and resource materials.  Only 47% of the students in N113L submitted and revised their writing in Criterion as compared to 79-89% in Bio100.  Students in N113L had available to them all of the same how-to PowerPoint presentation as the Bio100 students, but the Bio100 students had an additional

in-class activity wherein class groups revised writing under the direction of the instructor and the TAs.

About two thirds of the students felt Criterion helped them identify errors in their writing. Students who did not believe that Criterion was useful did not receive better grades than students who felt the program helped them identify errors in their writing. Once students became familiar with Criterion, they were willing to use Criterion to improve their writing in other classes (37% of the students in Bio100 used Criterion for non-Bio100 writing). The importance of having an online writing evaluation tool is further supported by the results of the survey indicating that 51% of the students do their own proof reading. Only 6% of the students use the library peer tutors or LARC to help them with their writing.

# Evaluation of Calibrated Peer Review in the Scientific Writing (Bio Sci 100) during the 2011 Winter Quarter

## Summary

## Number of Students
**Scientific Writing (Bio Sci 100)**
524 student were registered for the class.
417 students took the online survey.
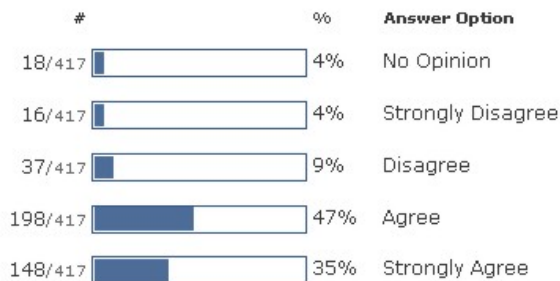
## Assignments
**Scientific Writing (Bio Sci 100)**
Three assignments required students to use the Calibrated Peer Review.
1. A Material and Methods section writing assignment was done as an in-class group project.
2. An Introduction and an Experimental Design writing assignment
3. A compare/contrast of six chapters in a book and a journal article
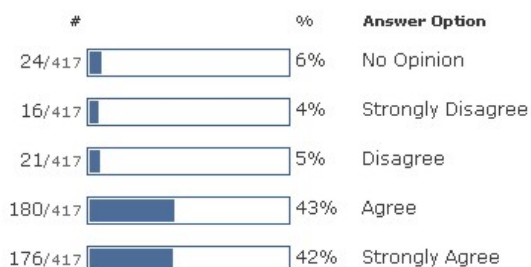
## Results from the EE Survey

82% of the students (148/417) found that evaluating essays according to a rubric was more difficult than they thought.



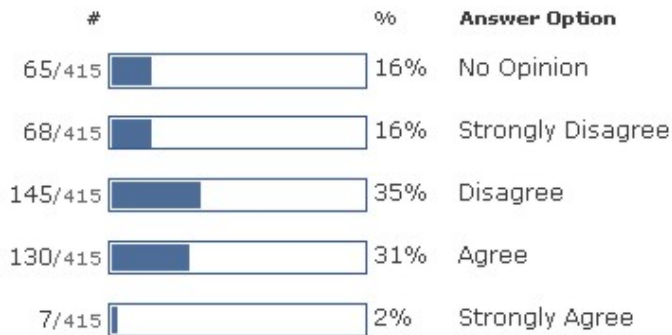CPR: Evaluating essays according to a rubric was harder than I thought.

| # | % | Answer Option |
|---|---|---|
| 18/417 | 4% | No Opinion |
| 16/417 | 4% | Strongly Disagree |
| 37/417 | 9% | Disagree |
| 198/417 | 47% | Agree |
| 148/417 | 35% | Strongly Agree |

Students (85%) liked having a rubric to follow when writing an essay.



CPR: Having the grading rubric available as I wrote the essay was helpful.

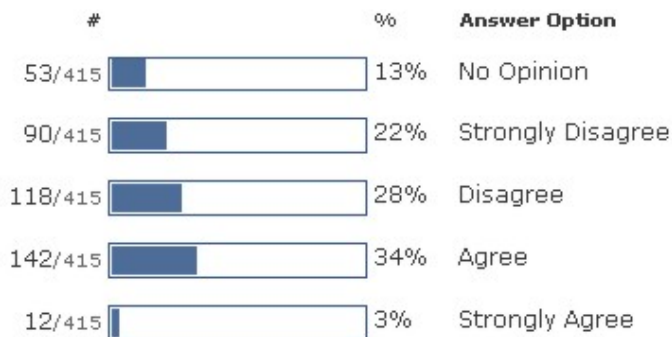| # | % | Answer Option |
|---|---|---|
| 24/417 | 6% | No Opinion |
| 16/417 | 4% | Strongly Disagree |
| 21/417 | 5% | Disagree |
| 180/417 | 43% | Agree |
| 176/417 | 42% | Strongly Agree |

Students did not feel that the Calibrated Peer Review score reflected the quality of their essay (51%) or their ability to do peer review (50%).

### The CPR text score reflects my essay.

| # | | % | Answer Option |
|---|---|---|---|
| 65/415 | | 16% | No Opinion |
| 68/415 | | 16% | Strongly Disagree |
| 145/415 | | 35% | Disagree |
| 130/415 | | 31% | Agree |
| 7/415 | | 2% | Strongly Agree |

### The CPR review score reflects my ability to peer review.

| # | | % | Answer Option |
|---|---|---|---|
| 53/415 | | 13% | No Opinion |
| 90/415 | | 22% | Strongly Disagree |
| 118/415 | | 28% | Disagree |
| 142/415 | | 34% | Agree |
| 12/415 | | 3% | Strongly Agree |

The two most common concerns students expressed in their comments about Calibrated Peer review was they felt that other students would not honestly grade their paper and there was too much leeway in the answer choices.

Representative student comments

> *"I think it's a terrible idea to have students grade each other. Students don't care whether or not they accurately grade another peer's writing. They just want to get it over with."*

> *"CPR calibration is very confusing. It is difficult to match the answers because a lot of the times the answers are subjective."*

> *"I do not think that my peers can grade my paper. I believe they can give me feedback on my writing style, choice of vocab, and ability to write, but it is my decision whether or not I use their comments. CPR is not an accurate way to judge a human being's writing."*

*"I don't think it works well because people have a lot of opinions on what is right. Therefore, they might not agree with CPR or see why CPR says it is wrong."*

*"I don't understand why we're graded on calibrations that are asking questions about our opinion. Everyone has different opinion as to what is relevant or what is unnecessary. I just feel like there's no one right answer."*

*"I know the calibrations are designed to make sure students are reviewing other student's papers correctly, but something should be done to make sure the students review other papers more accurately because I heard of several instances where student's received low scores due to inaccurate reviews."*

These student concerns were not supported in general by the CPR results. Students were able to "grade" essays of high and intermediate quality and their reviews of student essays often match that of other students.  There were instances were individual students did have reviews from students who had not taken the time to carefully review the essay.  Several cases were found were a student gave all the papers they reviewed the same scores.

After submitting their written essay, students must "grade" three other essays.  If the student "grades" the essay such that two thirds of the rubric grade choices correspond to the instructor's choice, the student is said to have mastered the calibration for that essay.  Over half of the students were able to master two of the three calibration essays.  The most difficult calibration essay for students to master was the weakest essay.

| Number of Calibrations mastered | % of Students |
|---|---|
| 0 | 5% |
| 1 | 29% |
| 2 | 36% |
| 3 | 30% |

Students receive a score for their ability to review other students' essays according to the same rubric used in the calibration grading portion of the Calibrated Peer Review process.  If a student rating of the peer's work is within 2.5 points from the average rating of three peer reviewers, the students receives full credit for the review.

| Number of Essay the Student Received full Credit for Peer Review | % of Students |
|---|---|
| 1 | 4% |

| | |
|---|---|
| 2 | 18% |
| 3 | 78% |

The last step of the Calibrated Peer Review process is a self assessment.  The student review their essays according to the same rubric used in the calibration grading portion of the Calibrated Peer Review process and their score is compared the average of the three peer reviewer score.

| Self Assessment deviation | % of Students |
|---|---|
| Greater  than 3 points from the average rating | 11% |
| Less than 3 points from the average rating | 13% |
| Less than 2.5 points from the average rating | 77% |

In conclusion, the student's perception of Calibrated Peer Review is highly negative even though most students did well on the different steps of the process.  Many students are able to review other students work accurately but have no confidence in the ability of their peers.