

Peer evaluation - a teaching element increasing the formative evaluation of the students

Håkan Torbern Tagesson

Faculty of Science, University of Copenhagen

Introduction

To increase the understanding and learning outcomes of the students, there should be a constructive alignment between the teaching activities and the intended learning outcomes for the student (Biggs & Tang 2011). Passive situations, such as traditional lectures and tutorials, should be avoided, and instead, exercises, discussion groups and other teaching elements where the student is an active part of the learning process should be used (Biggs & Tang 2011). It is when the knowledge is used actively, that a deeper form of understanding is reached. One such active form of teaching is peer evaluation, when the students are making an assessment and evaluation of other student's work.

Investigations have shown that the deepest understanding from feedback is gained by the person who gives the feedback and not the person that receives it (Rienecker et al. 2013). The analysis showed that feedback is more encouraging and helpful when given by a peer, than the feedback given by a teacher. Race (2001) mentions 7 main points to why teachers should bring in students in the evaluation of the student work. 1) the students are already evaluating their own projects while working on it. From this point of view, it is waste of resources not to give the students some tools for this evaluation which is anyway a part of their work (Sjøstedt 2013). The students reach a deeper form of understanding when evaluating their own and others work. 4) The students get a deeper understanding for the evaluation methods and of how their own work is evaluated by the teachers. They are no longer passive observers of the evaluation method,

but instead a part of it. 5) The students will be more independent by being an active part and contributing to the evaluation of their studies and learning. 6) The students gain life-long skills that are important for their career, such as assessing colleagues work, team building, etc. 7) The students get more feedback than if the teachers only would give the feedback. Generally, there are large class sizes and teachers have a tight schedule. It is thereby difficult for the teacher to give a proper feedback to everybody. By adding peer feedback as a teaching element, the students get more feedback than would otherwise be possible.

The main aim with this study was to investigate if a peer evaluation exercise gives a formative evaluation of the learning processes. I have three hypotheses; 1) the peer evaluation exercise will result in that more students get a proper feedback; 2) the feedback given by the other students are better than the feedback given by the teacher; 3) students working with similar methods and topics will give better feedback than students working with different methods and topics.

Material and Methods

I am responsible for planning and executing a course within remote sensing at the Department of Geosciences and Natural Resources at Copenhagen University. The course is given during Blok 3. During Blok 2, a similar course within remote sensing was given. Both courses have the same structure with some lectures and exercises, whereas a large part of the courses are based on a student project work. During the project work of the course given during Blok 2, the students were told to hand in a preliminary report two weeks before the deadline of the final report so that the teacher could give them some feedback and make some formative evaluation of the learning processes. However, this did not work out very well, and it was only one student group which handed in the preliminary report, the rest of the students did not hand in anything at all. For the final deadline, all groups handed in their report. In order to test my hypothesis that more students will get feedback than if only the teacher would give feedback I will compare the number of students getting feedback to the number of students getting feedback in the previous course.

The course during Blok 3 has 11 students in total and they are writing eight different projects. The course is also a preparatory course for their final master thesis, and the students were thereby allowed to choose if they

wanted to write in groups or individually. Two weeks before the final deadline I had a preparatory session for the peer evaluation exercise. During this session, the students were introduced to how to make an evaluation, and reasons for why they were doing a peer evaluation instead of me giving them the feedback. They were given the exercise instructions (appendix A), and the schedule for the exercise. Ten days before the final deadline of their project reports, they were told to exchange reports with their peers. I divided them into groups. In order to test my hypothesis that students working with similar methods and research questions were better in giving feedback to each other than students working with different topics, I divided them into 2 groups working with similar topics and methods and two groups working with different topics and methods. Finally, in order to test the hypothesis that the student's feedback was as good as the teacher's feedback, I posted at Absalson that the students, who want feedback from me, can send me their preliminary report and I will give them feedback as well.

Finally, I handed out an anonymous questionnaire to the students (appendix B). I asked them to respond to general statements if the peer feedback had helped them in their project, possible improvements of the exercise, if their peer worked with similar methods and topic, and which feedback was the best the peers' or the teachers'.

Results

Hypothesis 1. The peer evaluation exercise resulted in that more students got feedback

One group of students got feedback on their preliminary reports during the Blok 2 course, whereas during the peer evaluation exercise, 10 students out of 11 got feedback. The final student that did not get any feedback announced the week before that she will not hand in any report before the final deadline. Additionally, most students thought that the feedback from their fellow peers helped them regarding most parts of the project work (Figure 23.1). Generally, it can be said that the students were more satisfied with the general feedback of their report, rather than feedback regarding methods and evaluation of their results.

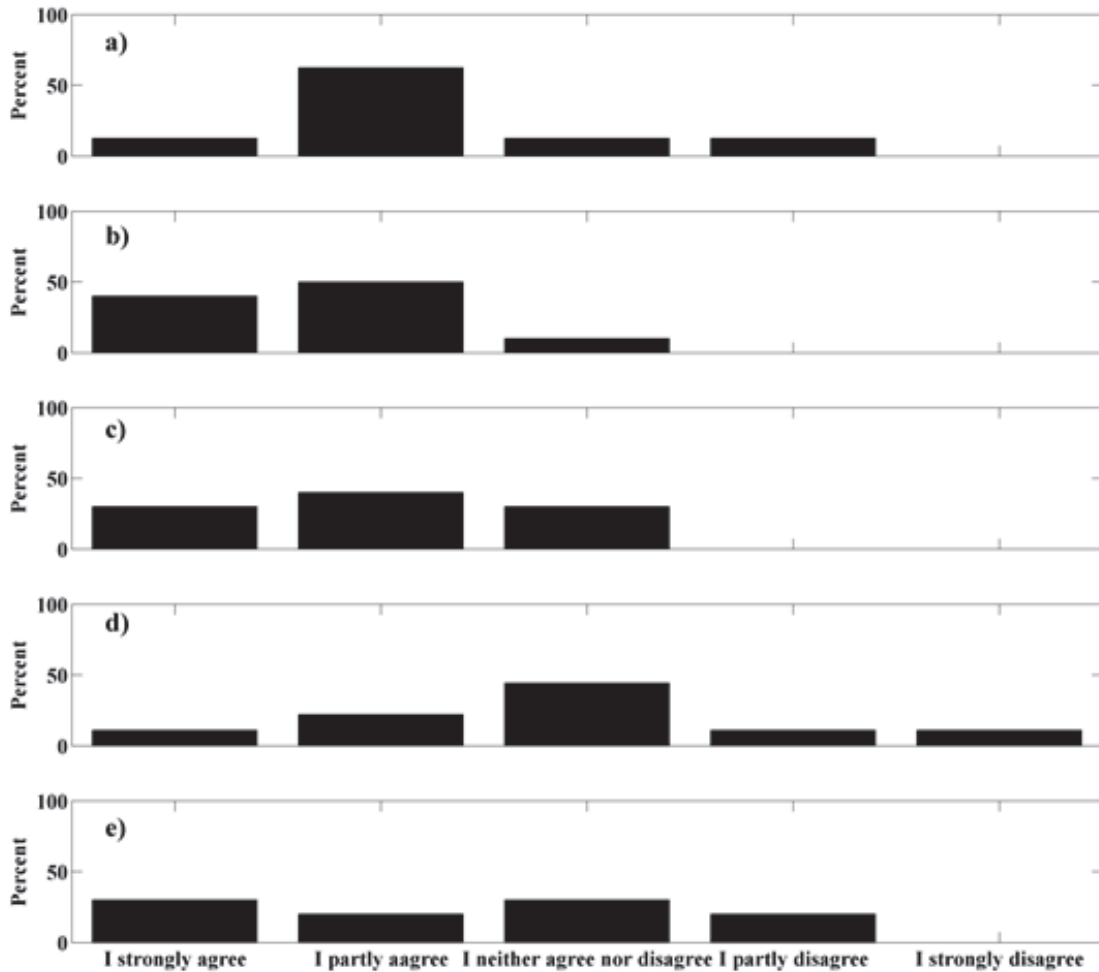


Fig. 23.1. The fraction of how students responded to the statements; a) “The feedback from my peer was very helpful for writing my final report”, b) “My peer gave me good general feedback”; c) “My peer gave me good feedback on specific points in the report”; d) “My peer helped me in solving methodological and technical issues”; e) “My peer raised questions related to my research question which helped me in the evaluation and discussion of my results”

Hypothesis 2. The feedback given by other students were better than feedback given by the teacher

There were no students that used the opportunity to send me their preliminary report. I can therefore not verify that students give better feedback than I do. However, in the questionnaire I included a question comparing the feedback they got from their peers in relation to the feedback they usually get from teachers (Figure 23.2). Some students did not want to com-

ment on this at all. Three students thought that it was better, whereas four students thought that the teacher's feedback usually is better. A student that thought that the teacher's feedback was better wrote in the comment field that, "both were helpful in different ways. The peers were mainly for motivational reasons and to help focusing on the structure". However, students that preferred the feedback from peers instead wrote "More in-depth [feedback] compared to normal standard from teacher and more discussion". Another student wrote "That was a very good exercise and I appreciated the feedback from my peer".

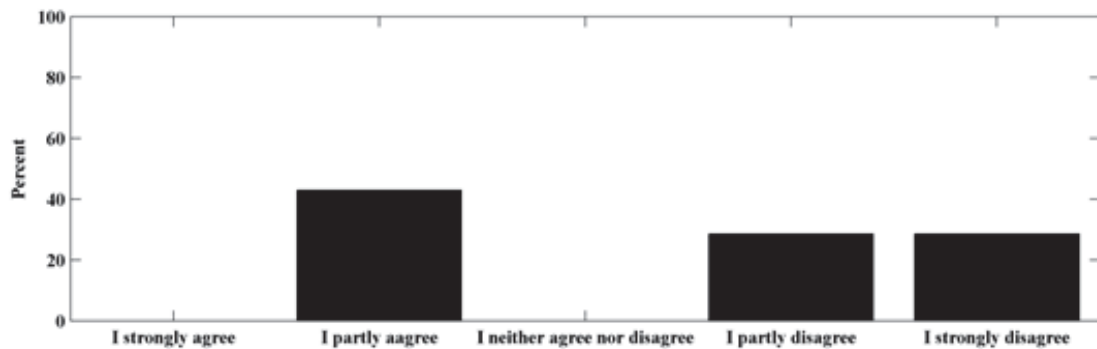


Fig. 23.2. Fraction of how students responded to the statement "The feedback from my peer was better than the feedback I usually get from a teacher".

Hypothesis 3. The feedback from students working with similar project was better than feedback from students working with different projects

In general, basically all students thought that their peers gave them good general feedback (Figure 23.1 b), so it did not matter if the topic of the peers were similar or not. There was a trend that the peers that used similar methods were better in giving feedback regarding methodological and technical issues than the peers that used different methods (Figure 23.3). This was not statistically significant though, partly due to the small sample size.

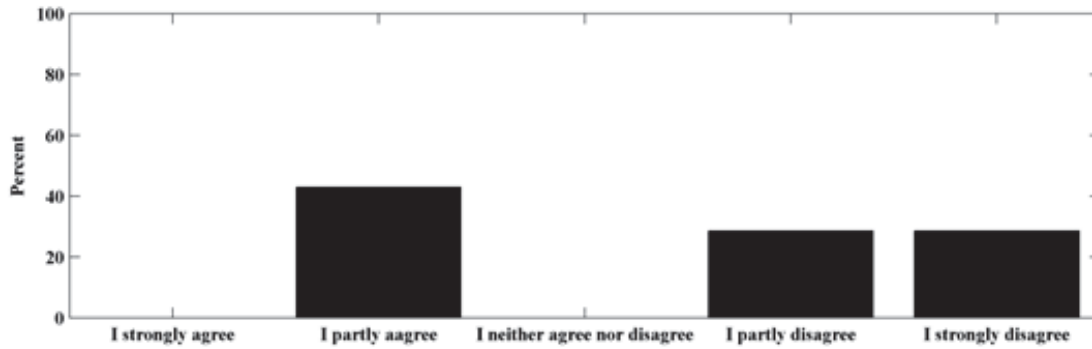


Fig. 23.3. Fraction of how students using similar (black) and different methods (grey) responded to the statement “My peer helped me in solving methodological and technical issues”.

Discussion

It can be concluded that the exercise in general was successful. I can conclude that the first hypothesis is verified. Most students got feedback and all students agreed to at least one of the statements given in Figure 23.1, indicating that all students got some help. Additionally, most students strongly agreed on many of the statements indicating that many got a lot of help. An issue with the feedback exercise was though that the students exchanged reports ten days before the final deadline. This was set so that the students would be able to incorporate feedback into their final reports, but it also resulted in that all groups came with unfinished reports. A comment by one of the students from the questionnaire was “Focus feedback technique on more unfinished products”, which is probably a good idea. In the instructions handed out to the students (Appendix A) focus was on how to evaluate a finished project. This is something that could be made better in the future. This is also a likely explanation to why the students did not hand in any reports for feedback during the course in Blok 2.

The results of the questionnaire do not allow me to draw any conclusion regarding the second hypothesis that students are better than teachers in giving feedback. Many students think that the teacher is better in giving feedback than their peer, whereas some think that their peer was better. I think that an explanation can be that many students still think that teachers are the authority and they know the “truth”. This is naturally not the case, and I think that master level students, which are very used to write reports, know if their reports are well done or not. They are thereby highly capable

of giving proper feedback (Race 2001). If the teacher would have a lot of time, the evaluation could be well done, but because of a tight schedule a fellow student with time gives better feedback.

I can falsify the final hypothesis in that students working with similar topics were gives better general feedback. For giving general feedback, you do not have to know a lot about the topic. It could possibly even be the other way around, that if you do not fully know the topic, it is easier for you to ask the stupid questions that help your peer in the project evaluation and the structuring of the project report. The second part of this hypothesis that students working with similar methods are better in giving feedback than others, can neither be falsified not verified. There was however a tendency towards getting better feedback from students working with similar methods. The methods are not as easy to grasp and knowing about the methods beforehand, thereby most likely help the student in giving the feedback.

I would generally say that this peer group exercise gives a formative evaluation of the learning processes. To give feedback makes the students more prepared themselves. By thinking of how others have structured their reports, it is easier to structure an own report in a clearer way. Giving feedback help improve critical thinking. The exercise is a thereby a tool for them to make a better final report. Additionally, it is time effective in that students have time for preparing the feedback of one report, whereas giving feedback to ten projects, or more, for the teacher is very time consuming. This study showed that it is possible, and with good results, to include the students in the evaluation process. It was motivating both for the students, that enjoyed both getting and giving feedback, and for the teacher that freed some time from the schedule.

A The teaching material handed out to the students

Peer Group Exercise- Remote sensing Seminars and Project work 2014

You are expected to carefully read and analyze your peer's project report, and to give your personal views. Your review should contain the following four points:

1. Concise summary of the report.
2. Evaluation of the report (assessment, positive and negative sides, unclear points regarding contents, structure, language, figures etc.).
3. Summary (accept/not accept, why).
4. Further comments (typos, hints for improvements).

Remember that the purpose of the exercise is not to condemn project reports or authors! The purposes of the peer group exercise are to:

1. Help the authors to make a better report.
2. Train to read reports, to try to understand them and learn to do a review.
3. Train the authors to take advice from others.
4. Learn how to write (and how not to write) from others.
5. Spread the content of report.

Questions to consider:

1. Does the project follow the standard structure of a research article including: Introduction, material and methods, results and discussion?
2. Is the scope of the project within the framework of the course?
3. Does the project address a valid problem or research question?
4. Has this study been done before?
5. Will readers be able to understand the report as it is written?
6. Should the project report be accepted?
7. If it is not to be accepted- how can the authors write a better project report?
8. If it is to be accepted- how can the authors help readers to understand the report more easily?
9. Are there related questions that the authors might want to address? Is there any related work that the authors might not know about?

Overall:

Be concise, but specific. If the report is not so well written, do not just say that it is bad. Specify what is not so well done. Tell them that it would have been better if... If a statement is incorrect, give a correct example. Be polite, remember the authors are humans and getting a bad review is a not a nice experience.

B The questionnaire

| Remote sensing seminars and project work | | | | | | |
|---|------------------|----------------|------------------------------|-------------------|---------------------|------------|
| <i>Evaluation form for the peer evaluation exercise</i> | I strongly agree | I partly agree | I neither agree nor disagree | I partly disagree | I strongly disagree | No comment |
| The peer evaluation exercise helped me structure my final report. | | | | | | |
| The peer evaluation exercise helped me getting started with the writing and analysis. | | | | | | |
| My peer gave me good general feedback. | | | | | | |
| My peer gave me good feedback on specific points of the report, (e.g. figures, language, etc.). | | | | | | |
| My peer helped me in solving methodological and technical issues. | | | | | | |
| My peer raised questions related to my research question which helped me in the evaluation and discussion of the results. | | | | | | |
| The topic of my peers report was similar to the topic of my report. | | | | | | |
| The method of my peers project was similar to the method of my project. | | | | | | |
| The feedback from my peer was very helpful for writing my final report. | | | | | | |
| Is there anything that could have been better with the exercise? | YES | | | NO | | |
| Clarify | | | | | | |
| Did you get any feedback from the teacher? | YES | | | NO | | |
| If yes: The feedback from my teacher was very helpful for finishing my final report. | | | | | | |
| If yes: The feedback from my peer was better than the feedback from the teacher. | | | | | | |
| Clarify | | | | | | |
| If no: The feedback from my peer was better than the feedback I usually get from a teacher. | | | | | | |
| Clarify | | | | | | |
| Additional comments: | | | | | | |

Thank you very much

All contributions to this volume can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/2014-7/

The bibliography can be found at:

http://www.ind.ku.dk/publikationer/up_projekter/kapitler/2014_vol7_nr1-2_bibliography.pdf/