

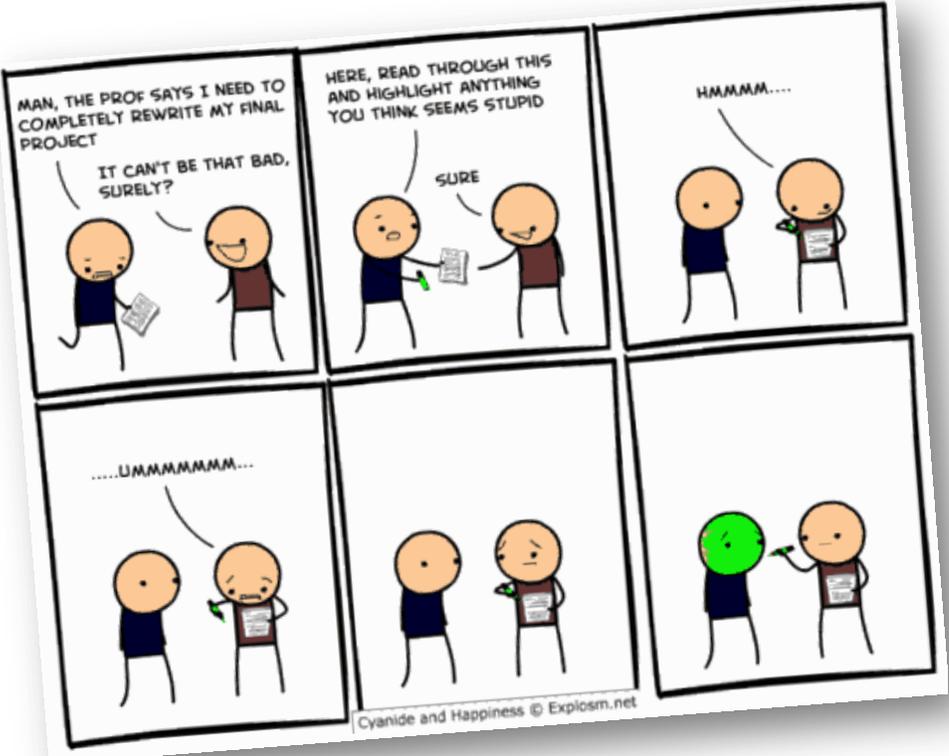
# RELATIONSHIP BETWEEN ATTITUDE TOWARDS PEER REVIEW AND QUALITY OF PEER FEEDBACK

*Final Research Article*

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## **ABSTRACT**

Peer feedback can be a useful assessment tool for teachers, but students may regard it as invaluable or intimidating. Our research explores the relationship between the attitude of second year bilingual students towards peer review and the quality of feedback they provide peers on a short writing assignment. To explore this relationship the students completed surveys on their attitude before giving and after receiving feedback, and the quality of their feedback was assessed using a rubric. Data analyses reveal that students generally become more confident and see peer review as more valuable after having received feedback of good quality. Furthermore, if sufficient scaffolding is provided by the teacher, inexperienced or unmotivated students are able to provide feedback of good quality.

## 1. INTRODUCTION

### 1.1 CONTEXT & RELEVANCE

Our research took place at a Dutch public secondary school that offers Dutch as well as bilingual (TTO) education. The school is committed to professional development as an active participant in the *Pro-Feed* project: an effort between *Utrecht University*, *Hogeschool Utrecht* and six local secondary schools. *Pro-Feed*'s goal is to professionalise feedback processes at the participating schools. The aim of our research is to contribute to the on-going professionalization by offering a unique student perspective on a subdomain of feedback, namely that of peer feedback.

### 1.2 PROBLEM STATEMENT

Giving effective feedback can be a challenging and time-consuming task for teachers. As the most effective feedback generally takes place when learners are involved in the feedback process, it seems appealing to adopt a student-centred approach such as peer feedback (Carr, 2008). Using peer feedback on written assignments in the bilingual classroom can yield many benefits for both the learners and teachers involved. Peer feedback then functions as a formative assessment tool and encourages learners to reflect upon their own and their peers' learning.

Since the effectiveness of peer feedback as a learning tool at a formative stage is largely dependent on the quality of the provided feedback (Sluismans et al., 2002; Prins et al., 2006; Gielen et al., 2010), we have set out to explore the possible relationships between learners' attitudes at a pre- and post-review stage and the quality of the peer feedback provided. Although students' perception of peer review has previously been studied (albeit in a limited fashion), the relationship between their perception and the quality of feedback given and received has not. Hattie and Timperley (2007) have suggested that students' confidence in the correctness of peer feedback affects their receptivity to and seeking of feedback. Additionally, Mulder et al. (2014) have determined that university students' attitude towards peer feedback is influenced by the perceived level of their own and their peers' ability to provide effective feedback. Based on these findings we expect to track a significant relationship between a learner's attitude towards giving feedback, and the quality of feedback given.

By means of our practice based research we set out to gain more insight into the attitude of bilingual secondary school students towards a system of peer feedback, and how their attitude

in a pre-review stage influences the quality of the feedback, and how that feedback in turn influences the attitude of students towards receiving peer feedback and implementing it into a final product. We also hope to state several practical recommendations focused on necessary preconditions that can make a system of peer feedback successful.

## 2. THEORETICAL BACKGROUND

In order to determine the relationship between students' attitudes towards feedback and the quality of the feedback, we will first review the existing literature on effective feedback, student attitudes towards peer feedback and the criteria to determine the quality of feedback.

### 2.1 DEFINING PEER FEEDBACK

Peer feedback is in essence a performance assessment tool to stimulate learning. Peer feedback generally consists of constructive feedback on strengths and weaknesses by fellow students of equal ability, as opposed to expert feedback by the teacher (Falchikov, 1996). It is often both a form of formative assessment (Topping, 1998) and collaborative learning (Van Gennip et al., 2010). There are many advantages to using peer feedback. It (a) makes students actively take part in their own learning, (b) is useful and results in effective revision of the product, (c) is more informal and complements formal teacher feedback, (d) helps students to become more critical of their own writing, (e) creates a real and more personalized audience for writing assignments, (f) encourages communication and collaboration, (g) provides better understanding of reader expectations, (h) allows for more feedback and a quicker response, (i) adds a social dimension and negotiation of meaning that may improve students' attitudes towards writing, (j) helps students gain confidence and motivation by seeing peers' strength and weaknesses and (k) in the long run and with proper initial training, decreases a teacher's workload (e.g. Moore, 1986; Mittan, 1989; Leki, 1990; Mendonca & Johnson, 1994; Hirvela, 1999; Ferris, 2003; Rollinson, 2005; Carr, 2008; Lunstrom & Baker, 2009; Ferris & hedgcock, 2013).

On the other hand, peer feedback may also (a) be time-consuming, (b) be vague, incorrect or unhelpful, (c) require pre-training and lengthy instructions, (d) be regarded as invaluable or intimidating by students compared to expert teacher feedback and (e) depend on the responsibility of the students instead of the teacher (e.g. Leki, 1990; Liu & Hansen, 2002; Ferris, 2003; Rollinson, 2005; Gielen et al., 2010).

### 2.2 EFFECTIVE PEER FEEDBACK

Sadler (1989) and Hattie & Timperley (2007) narrow feedback down to three questions: (a) feed up: *where am I going?* (student must be aware of the criteria of the level being aimed for), (b)

feed back: *how am I going?* (student compares their own level to the criteria), and (c) feed forward: *where to next?* (student takes appropriate action in order to close the gap between the two). To answer these three questions in a process of peer feedback, there needs to be (a) a format for feedback, i.e. questionnaires, checklists, rating scales, rubrics (*where am I going?*), (b) questions, statements, and prompts to scaffold the feedback process and communication (*how am I going?*), and (c) specific feedback or task that will lead to follow-up action (*where to next?*).

The outcomes of various studies that have evaluated the quality and effectiveness of peer feedback have shown that peer feedback is generally effective when it (a) is frequent, (b) is motivated or explained, (c) is balanced between strengths and weaknesses, (d) is clearly formulated and detailed, (e) is neutral and non-judgemental, (f) is focused on students' performance rather than on the students themselves, (g) provides advice for improvement that can be directly implemented by the students, (h) fits the objectives and criteria of the assignment, and (i) has been preceded by clear instructions (e.g. Rollinson, 2005; Prins et al., 2006; Nelson & Schunn, 2009; Woolfolk et al., 2008; Nilson, 2010).

In order for peer feedback to be effective, the participants must be explicitly taught and trained in the process (Rollinson, 2005; Gielen et al., 2010; Carr, 2008). Young or immature learners will also require more explanation and training, and the expected student behaviour during peer feedback must also be clearly communicated (Carr, 2008; Ferris & Hedgcock, 2013). Feedback needs to be offered individually or in pairs and students should be of equal or similar ability (Hattie & Timperley, 2007; Gielen et al., 2010).

### **2.3 STUDENT ATTITUDE TOWARDS PEER FEEDBACK**

The notion of student attitudes towards peer feedback has previously been studied in a limited fashion (e.g. Brindley and Scoffield, 1998; Wen & Tsai, 2006; Biggs and Tang, 2007; Vickerman, 2009; Cartney, 2010; Moore & Teather, 2013; Mulder et al., 2014). In these studies, attitude encompasses students' prior experience, perception of usefulness, own abilities, abilities of their peers, (dis)advantages of peer review, expected challenges, confidence, willingness to cooperate, teacher's expectations, attitude towards reviewing another student's work, attitude towards having their work reviewed by another student, and expected outcome of the final assessment.

Students in these studies showed varying attitudes towards peer feedback. Some

recognized the benefits, such as a raised awareness of teacher's expectations and an increase in confidence concerning their own work (Moore & Teather 2013; Mulder et al., 2014), and some expressed a concern about its disadvantages, such as a difference in level of quality or a difference in ability levels (Cartney, 2010; Mulder et al., 2014). Students with prior experience also appeared to be less optimistic about peer feedback (Mulder et al., 2014).

## **2.4 QUALITY OF FEEDBACK CRITERIA**

The quality of feedback is an important concern. Research has shown that student achievement is highly dependent on the quality of feedback they receive (Hattie, 1987; Brown and Knight, 1994). Students also want to receive high quality feedback and are often found to be unhappy with the quality of feedback they receive (Hyland, 2000; O'Donovan et al., 2004).

The criteria to evaluate the quality of feedback for learning have been defined previously (e.g. Sluijsmans et al., 2002; Prins et al., 2006; Gielen et al., 2010). These criteria include use of assessment criteria, justification, objectivity, specificity, formal language, clear formulation, positive comments, and suggestions for improvement. More specifically, high quality feedback should (a) be relevant to the content, lay-out and language of the written assignment, (b) make use of explanatory comments, (c) be based on neutral observations rather than feelings and/or opinions, (d) make reference to explicit aspects of his/her peer's writing assignment, (e) make use of a register, tone and language style that serve the context and intention of the feedback task, (f) be consistently clear and coherent (Gielen et al., 2010).

### **3. RESEARCH QUESTIONS, HYPOTHESES & VARIABLES**

#### **3.1 CENTRAL RESEARCH QUESTIONS**

1. Is there a relationship between the attitude of students towards peer feedback and the quality of feedback they give?
2. Is there a relationship between the quality of the feedback received and students' attitude towards receiving and implementing peer feedback?

#### **3.2 SUB-QUESTIONS**

1.
  - a. What is the attitude of students towards giving peer feedback?
  - b. What is the attitude of students towards receiving and implementing peer feedback?
2. What is the quality of the peer feedback given based upon previously defined criteria?

#### **3.3 HYPOTHESES**

Based upon previous research outcomes (i.e. Hattie & Timperley, 2007; Mulder et al., 2014), we expect that a positive linear relationship exists between the attitude of a student to participate in the whole process of peer review, the quality of feedback and the attitude of a student to implement received feedback:

- A more positive (negative) attitude towards giving peer feedback will result in provided feedback of higher (lower) quality.
- Feedback of higher (lower) quality will result in a more positive (negative) attitude towards receiving and implementing feedback.

#### **3.4 VARIABLES**

The variables involved in this research can be placed within two different categories, namely those related to the attitude of the students and those related to the quality of feedback.

The attitude of the students will be investigated from two different viewpoints: the *attitude of the students to give feedback* and the *attitude of the students towards receiving and implementing feedback*. According to previous research on attitude (Wen & Tsai, 2006; Mulder et al., 2014), 'attitude' encompasses the perception of: usefulness, own ability, peer's ability, educational benefits for improving written work, aspects of peer review most valuable for

learning, and (dis)advantages. The potential role of prior experience will also be taken into account.

The *quality of feedback the students provide* will be evaluated based upon the criteria defined by Gielen et al. (2010), including:

- Use of assessment criteria (appropriateness)
- Justification
- Specificity
- Objectivity
- Presence of both suggestions for improvement and positive comments
- Clear formulation
- Formal language

## 4. METHODS

### 4.1 RESPONDENTS

Our target group consisted of two bilingual second year geography classes of the HAVO and VWO streams respectively. In total, 8 students of class 2TH and 23 students of class 2TAG participated, which implies the total population ( $n$ ) is 31. Of the total student population 14 were girls and 17 were boys and most students are between 13 and 14 years old.

### 4.2 INSTRUMENTS

In this study various research instruments have been employed:

1. *Writing assignment* (Appendix A)

The students wrote a school magazine article of approximately 250 words on cultural difference experienced during an exchange week in Italy. We chose the school magazine format because peers provide more honest and useful feedback if the students themselves are the actual target audience in the writing assignment (Nilson, 2010).

2. *Rubric with criteria for the assessment of the writing product* (Appendix B)

The rubric has been developed based on the students' abilities and prior experience, the teacher's expectations and the criteria of the Language A rubric for MYP3. The descriptors are related to lay-out and length, content, and language, but students were only instructed to provide feedback on content and language. Distributing the rubric to the students helped to make the assessment, the teacher's expectations and the learning process more visible to the learners (Miller, 2003; Dale et al., 2010).

3. *Instructions and worksheet guiding the peer feedback process* (Appendix C)

Students gave feedback on one draft product. It is generally recommended to pair classmates with comparable writing capabilities together, based on their previous writing scores (referred to as the *equal status students principle* by Gielen et al., 2010). However, in consultation with the teacher we decided to let the students choose their own peer in order to create a safe learning environment, ensuring inexperienced students feel less intimidated by the feedback from their peers as they get to pick their own partner. Subsequently, the peers discuss the given and received feedback with each other to prevent misunderstandings and

to maintain an open and safe environment of positive interdependence (Ferris & Hedgcock, 2013).

Previous studies have indicated that peer review with students that have limited experience with writing and peer feedback requires appropriate scaffolding by the teacher (e.g. Hattie & Timperley, 2007; Dale et al., 2010; Ferris & Hedgcock, 2013). Therefore in this study the students received instructions on how to give peer feedback of good quality and a worksheet to guide them in the process. The instructions included the sharing of prior experiences, an explanation of the criteria for feedback of good quality and an examination of a similar writing product, in line with Ferris & Hedgcock (2013). See the appendices for the presentation with the instructions on peer review. The guiding worksheet was well-structured but not too specific, so there was room for students' opinions (Ferris & Hedgcock, 2013). The first section asked students to score the level for each of the descriptors in the rubric. This part was not used in the data analyses but was intended to help the students become more familiar with the assessment criteria. The second part of the worksheet asked the students to give both positive comments and suggestions for improvement as related to respectively language and content, forcing them to give a more specific and careful summary note (Ferris & Hedgcock, 2013). These comments and suggestions were analysed to assess the quality of the feedback that each student gave.

4. *Pre-review survey to evaluate the attitude of students to give peer feedback* (Appendix D)

The pre-review survey focused on expectations (*'I expect that ... will be'*) and consisted of thirteen questions, of which eleven were closed and two were open (Q13 and 14). All answers to closed questions were analysed quantitatively, apart from Q1 and 10, which respectively asked the student about prior experience and the aspect of peer review (i.e. giving vs. receiving) they expected to be most valuable for learning. Our pre and post-review questions are categorised according to several categories that could affect attitude, including: prior experience (Pre: Q1), perception of usefulness (Pre: Q2; Post: Q1), perception of peer's ability (Pre: Q3; Post: Q2, 3, 4, 5 and 6), perception of own ability (Pre: Q4, 5, 6 and 7), perception of educational benefits for improving written work (Pre: Q8, 9 and 11; Post: Q7, 8 and 12), and perception of aspects most valuable for learning (Pre: Q10; Post: Q9). These questions and categories are based on surveys by Mulder et al. (2014), Hanrahan & Isaacs (2001) and Wen & Tsai (2006). Q6 and 7 are linked to the rubric used to

assess the quality of the feedback to explore a student’s attitude towards giving feedback according to the rubric. We used the total score of the pre-review survey to determine students’ attitude towards giving feedback. A Cronbach’s Alpha was calculated to measure the internal consistency and reliability of the pre-review survey and the questions used in order to form a scale regarding students’ attitude towards peer feedback at a pre-review stage. This scale consisted of 9 items ( $\alpha = .53$ ).

5. *Post-review survey to evaluate the attitude towards receiving and implementing feedback* (Appendix E)

The post-review survey focused on experience (*‘I think that ... was’*) and consisted of fourteen questions, of which twelve were closed and two were open (Q13 and 14). Like for the pre-review survey all answers were analysed quantitatively, apart from the open questions and Q9 which asked the students about the aspect of peer review (i.e. giving vs. receiving) they learned most from. The questions in the second survey largely mirrored the questions in the first survey so that we could track changes in attitude.

<b>Pre-review survey Question</b>	<b>Post-review survey Question</b>
2	1
3	2
4	3
5	4
6	5
7	6
8	7
9	8
10	9
11	12
12	13
13	14

**Table 1.** Link between questions from the pre- and post-review surveys.

The post-review questions are also based on the surveys by Mulder et al. (2014), Hanrahan & Isaacs (2001), Wen & Tsai (2006) and our rubric assessing the quality of the feedback.

Q10 and 11 constitute a separate category and focus on students' willingness towards implementing the received feedback. A Cronbach's Alpha was calculated to measure the internal consistency and reliability of the post-review survey and the questions used on the post-review survey in order to form a scale regarding students' attitude towards peer feedback after having given and received feedback. This scale consisted of 11 items ( $\alpha = .90$ ).

6. *Rubric with criteria for the assessment of the quality of feedback* (Appendix F)

Based upon previous research outcomes feedback of good quality should be related to the assessment criteria in the rubric, i.e. specific, justified, clearly formulated, formal, objective and should include both constructive criticism and praise (Sluijsmans et al., 2002; Prins et al., 2006; Gielen et al., 2010; Ferris & Hedgcock, 2013). Because of the scaffolding we provided with our worksheet the criterion pertaining to a balance between suggestions for improvements and positive comments was automatically met. Hence our rubric uses the following six criteria: (1) use of rubric, (2) justification, (3) objective, (4) specific, (5) formal and (6) clearly formulated. For the complete rubric see the appendices.

### **4.3 RESEARCH SET-UP**

#### *Procedure*

After we designed the above mentioned instruments we obtained the data required to answer the research questions by following the procedure described below. In this procedure the data was collected in stage 4, 5 and 7:

*Stage 1 Give students instructions for the writing assignment*

*Stage 2 Students write draft product using rubric*

*Stage 3 Give students instructions on peer feedback*

*Stage 4 Pre-review survey on attitude towards giving feedback*

*Stage 5 Peers give each other feedback using rubric and worksheet*

*Stage 6 Peers discuss received feedback*

*Stage 7 Post-review on attitude to use received feedback*

*Stage 8 Students write final product*

*Stage 9 Final assessment by teacher*

Students completed the pre-review survey after we gave instructions on peer review in order to make sure that these students – with relatively limited experience – were well-aware of the different steps within the peer review process and were familiar with the criteria for giving feedback of good quality. The post-review survey was conducted directly after the students discussed the given feedback together due to time limitations set by the school and to ensure students had a good recollection of the feedback received.

### *Data analyses*

Apart from the open questions and the questions on prior experience and the most useful aspect of peer review, the surveys used a five-level bipolar Likert scale (Likert, 1932), ranging from very negative to very positive responses to a statement. In order to compare the results of the pre-review and post-review survey and to run analyses which investigated the relationship between students' attitude and the quality of feedback, the five-levels of the Likert scale were assigned a value of 1-5 with 1 being the most negative answer and 5 being the most positive answer. In our analyses we compared the mean scores of individual questions (rather than the previously defined categories) with the quality of the feedback. Additionally, students' responses on the surveys were totalled by adding up the values from each of the individual questions to determine the students' overall attitude towards the peer feedback process. The pre-review survey had 9 Likert scale questions, yielding a maximum of 45 points. The post-review survey had 11 Likert scale questions which were analysed, yielding a maximum of 55 points. Taking their total score on the respective survey and dividing it by these corresponding maximum scores for each survey calculated attitude scores for the students.

Our assessment of the quality of the feedback was similarly quantified. To ensure proper and consistent assessment of the quality of feedback four randomly selected feedback worksheets were assessed by different persons from our research group and their assessments were compared afterwards for moderation purposes. The rubric used four different levels for the quality of feedback. *Excellent* (4 points) was the highest score a student could receive on a criterion related to feedback given on the content or language of a peer's writing assignment, followed by *good* (3 points), *average* (2 points) and *low* (1 point). The scores for the six different criteria pertaining to the quality of feedback were added up for both content and language related

feedback, resulting in a maximum of 48 points (of which 24 points for content and 24 points for language).

The data from the surveys and rubrics were grouped differently to compare differences in attitude and quality of feedback separately for students' level, gender and experience, and for individual survey questions. For each means, maximums, minimums, standard deviations, modes and medians were calculated. Comparison of these datasets from the pre-review and post-review surveys to the quality of the given feedback allowed us to check for statistically significant correlations and thus answer our research questions and evaluate our hypotheses. Note that non-significant correlations will not be discussed in this report.

## 5. RESULTS

### 5.1 PRELIMINARY ANALYSES

Before conducting the main analyses related to the research questions, preliminary analyses were performed.

The first preliminary analysis examined the differences in mean scores related to gender and involved an independent samples t-test. The Levene's test for equality of variance for this independent samples t-test was not significant, so equal variances can be assumed. As illustrated in Fig. 1, on average the girls provided feedback of higher quality ( $n=14$ ;  $M=38.5$ ,  $SD=4.47$ ) than the boys ( $n=17$ ;  $M=32.4$ ,  $SD=3.16$ ), where the highest possible score for quality of feedback was 48. This difference was significant ( $t(29) = 4.48$ ;  $p < 0.01$ ).

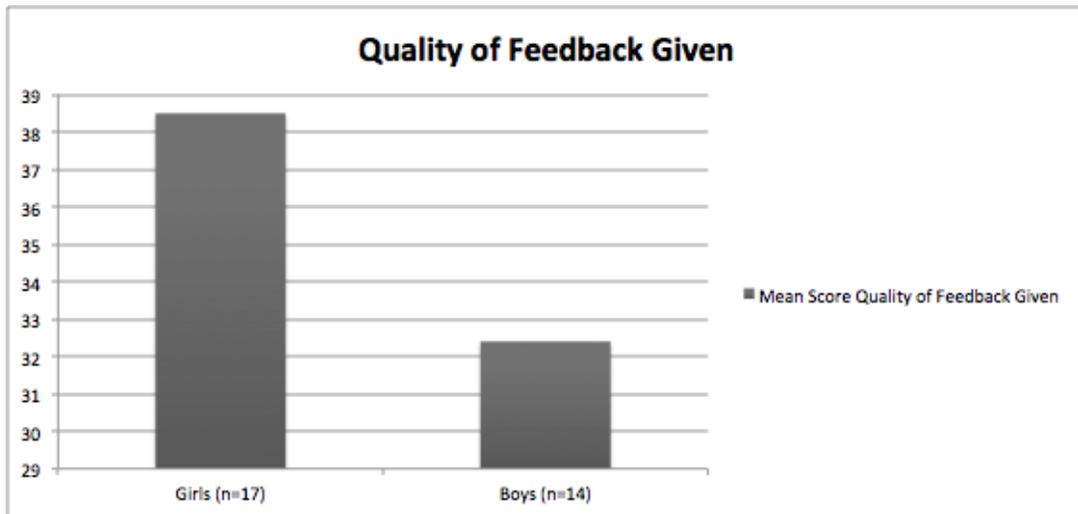


Fig. 1. Mean scores of the quality of feedback given by girls and boys.

Further preliminary analyses examined if there is a significant relationship between whether or not students have prior experience in giving peer feedback and the quality of the feedback they provided as well as their attitude towards giving peer feedback. The majority of the students ( $n=20$ ) in the sample had no prior experience giving feedback. As can be seen below in Fig. 2, there is no significant difference in the quality of feedback between students with and without prior experience ( $t(29) = .225$ ;  $p > 0.05$ ). Furthermore, as illustrated in Fig. 3, the results of independent samples t-tests also showed that the relationships between students' prior experience and their attitude towards peer feedback is also non-significant ( $t(29) = 1.78$ ;  $p > 0.05$ ).

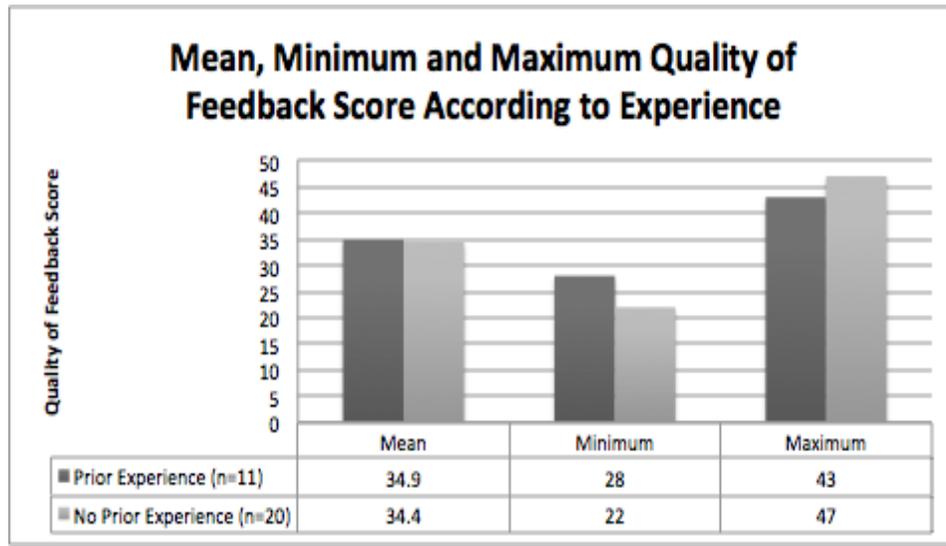


Fig. 2. Mean, minimum and maximum quality of feedback scores according to students' prior experience.

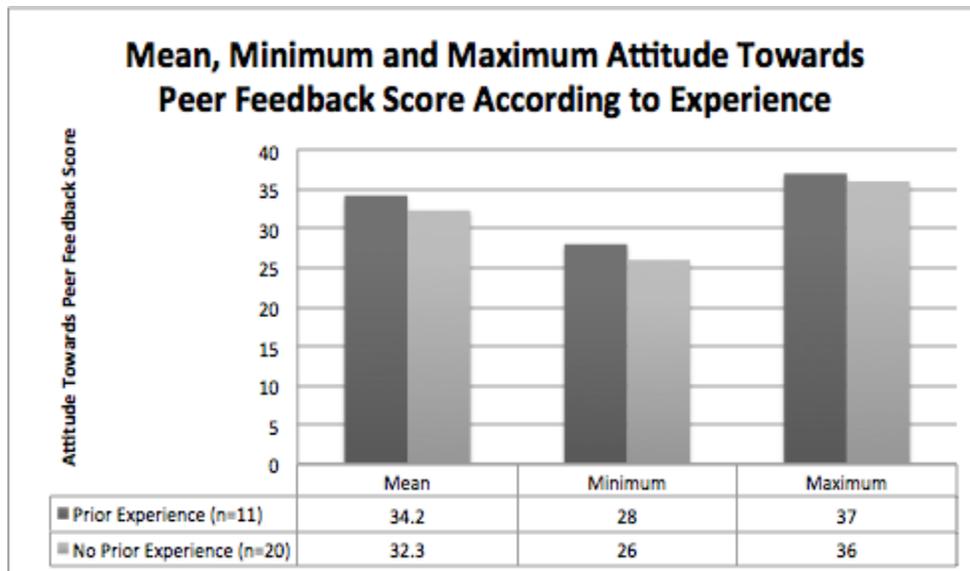


Fig. 3. Mean, minimum and maximum attitude scores according to students' experience.

## 5.2 RESULTS

The central research questions aim to determine if there is a relationship between attitude towards peer review and the quality of the feedback. Here we explore the results to answer our research questions and explore the validity of the corresponding hypotheses we formulated.

*Students' attitude towards peer review*

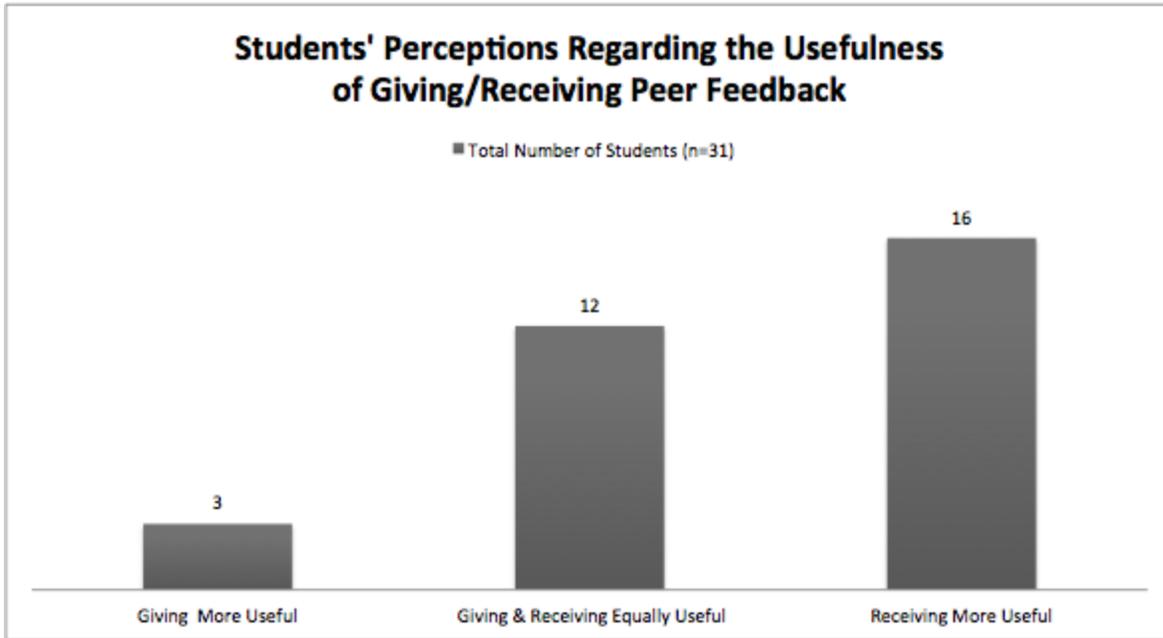
The results of the pre- and post-review surveys were examined in order to look for any relevant findings related to students' attitudes before giving and after receiving peer feedback. Their change in attitude was assessed by comparing student's individual answers in the pre-review survey vs. post-review survey for questions that were linked according to Table 1. The results presented here are the mean scores of the (1-5) responses provided by the students for the pre-review vs. post-review survey questions.

By comparing the pre-review and post-review answers we found (as shown in Fig. 4) that students rated the usefulness of receiving peer feedback (Q1 of the post-review survey) higher than their expectation regarding the usefulness of giving peer feedback (Q2 of the pre-review survey).

	<b>Expected Usefulness of Giving Peer Feedback (Pre-review survey)</b>	<b>Perceived Usefulness of Receiving Peer Feedback (Post-review survey)</b>
<b>Mean Scores of the Expectation of the Usefulness of Giving and the Perception of the Usefulness of Receiving Peer Feedback</b>	3.7	4.0

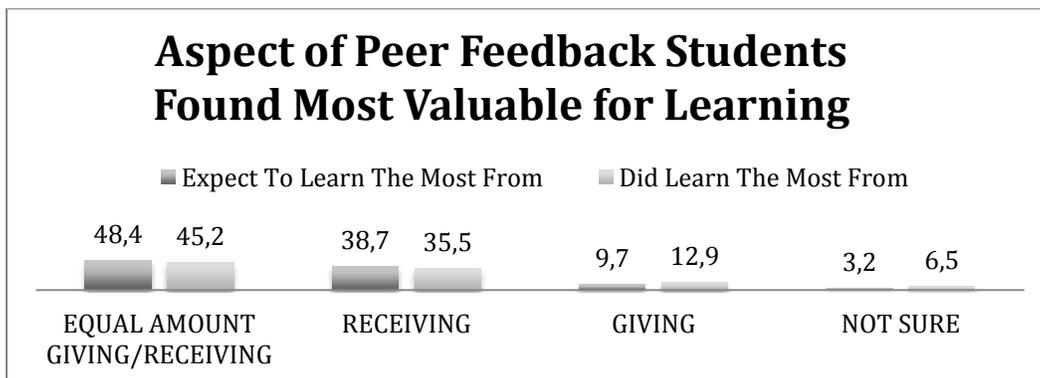
**Fig. 4.** Students' expectations and perceptions related to the usefulness of peer feedback.

By comparing students' perception of how useful they expected *giving* peer feedback to be (Q2 of the pre-review survey) to how useful they perceived *receiving* peer feedback to be (Q1 of the post-review survey), the perception with respect to the usefulness of the different aspects of peer review (giving vs. receiving) was given a score, i.e. (1) if students rated their expectation of *giving* peer feedback more useful than *receiving* peer feedback, (2) if rated equally useful as *receiving* or (3) if rated less useful than *receiving*. The number of students with a score of (1), (2) or (3) were totalled to determine how many students rated *giving* peer feedback as being more useful, equally useful or less useful compared to *receiving* feedback. As illustrated by the distribution in students' perception in Fig. 5, the majority of students ( $n=16$ ) rated receiving peer feedback as being more useful than giving peer feedback ( $n=3$ ).



**Fig. 5.** Students' perceptions regarding the usefulness of giving vs. receiving peer feedback.

Another finding obtained by totalling and comparing students' responses to two related questions on the pre-review and post-review survey concerned which aspect of peer review (giving vs. receiving) students expected to *learn most from* (Q10 of the pre-review survey) and *did learn most from* (Q9 of the post-review survey). Fig. 6 shows that both before and after having engaged in peer review, students believed they learned the most from both giving and receiving, or only receiving feedback. Few students expected to learn the most from only giving feedback.



**Fig. 6.** Results of students' perceptions of the aspect of feedback from which they expected to / did learn the most.

An additional result by comparing related pre- and post review scores (1-5) of students is shown in Fig. 7 was that students generally rated their own ability to give feedback of good

quality (Q4, Q5, Q6 and Q7 of the pre-review survey) slightly higher than their peers' ability (Q3, Q4, Q5 and Q6 of the post-review survey). Despite the students rating their own abilities to give quality feedback on their peers' assignments higher than their peers' ability to give them feedback on their own work, the results do indicate that students generally felt more positive about their peer's ability to provide feedback after having actually received their feedback. This was shown by comparing the mean students' scores of Q3 of the pre-review survey (3.5) to Q2 of the post-review survey (3.7).

Average Scores	Own ability	Peers' ability
<b>Feedback</b>	<p style="text-align: center;"><b><u>3.7</u></b></p> <p><i>I think that I know enough about the language and content to give my peers helpful feedback on the assignment:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>	<p style="text-align: center;"><b><u>3.6</u></b></p> <p><i>I think that the feedback that I received from my peer on the of my assignment was:</i></p> <ol style="list-style-type: none"> <li>1. Useless</li> <li>2. Not very useful</li> <li>3. No opinion</li> <li>4. Useful</li> <li>5. Very useful</li> </ol>
<b>Suggestions for Improvement</b>	<p style="text-align: center;"><b><u>3.9</u></b></p> <p><i>I think that I will be able to give my peer <b>suggestions for improvement</b> that can help him/her improve the quality of their assignment:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>	<p style="text-align: center;"><b><u>3.9</u></b></p> <p><i>I think that the <b>suggestions for improvement</b> that my peer gave me can help me to improve the quality of my own assignment:</i></p> <ol style="list-style-type: none"> <li>1. Useless</li> <li>2. Not very useful</li> <li>3. No opinion</li> <li>4. Useful</li> <li>5. Very useful</li> </ol>
<b>Objective, Respectful, Clear and Specific in Feedback</b>	<p style="text-align: center;"><b><u>4.1</u></b></p> <p><i>I think that I will be able to stay <b>objective, respectful, clear and specific</b> when giving my peer feedback comments on the assignment.</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>	<p style="text-align: center;"><b><u>3.8</u></b></p> <p><i>I think that my peer was <b>objective, respectful, clear and specific</b> when giving feedback comments on my assignment:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>

**Fig. 7.** Students' perceptions regarding their own and their peers' ability to give feedback.

Additionally, as illustrated in Fig. 8, the total mean score of the students' attitude towards peer feedback did not change after having received peer feedback.

	Attitude Before Peer Review (Pre-Review Survey)	Attitude After Peer Review (Post-Review Survey)
Mean Score	33/40	40/55
Percentage	73%	73%

Fig. 8. Comparison of student's attitude towards peer feedback before and after having received peer feedback.

While the students' overall attitude towards peer feedback did not increase, the change in response of students to Q8 in the pre-review and Q7 post-review surveys did indicate that they felt more confident about their work after having received peer feedback. Moreover, students were quite positive about the potential of giving and receiving feedback to help them get a better final grade for their writing assignment. The mean scores of students on the pre-review vs. post-review survey related to understanding the teacher's expectations, confidence about their work and the potential of giving and receiving feedback to help them get a better grade have been summarized in Fig. 9.

	Mean Score Pre-Review Survey	Mean Score Post-review survey
<b>Understanding Teacher's Expectations for the assignment</b>	<p><b>3.5</b></p> <p><i>I think that <b>giving peer feedback</b> will help me to better understand what the teacher expects from us in this assignment:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>	<p><b>3.3</b></p> <p><i>I think that <b>receiving peer feedback</b> has helped me to better understand what the teacher expects from us in this assignment:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>
<b>Confident about my own work</b>	<p><b>3.1</b></p> <p><i>I think that <b>giving peer feedback</b> will make me feel more confident about my own work:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>	<p><b>3.4</b></p> <p><i>I feel more confident about my own writing assignment after having <b>received peer feedback</b>:</i></p> <ol style="list-style-type: none"> <li>1. Strongly disagree</li> <li>2. Disagree</li> <li>3. Neither agree nor disagree</li> <li>4. Agree</li> <li>5. Strongly agree</li> </ol>

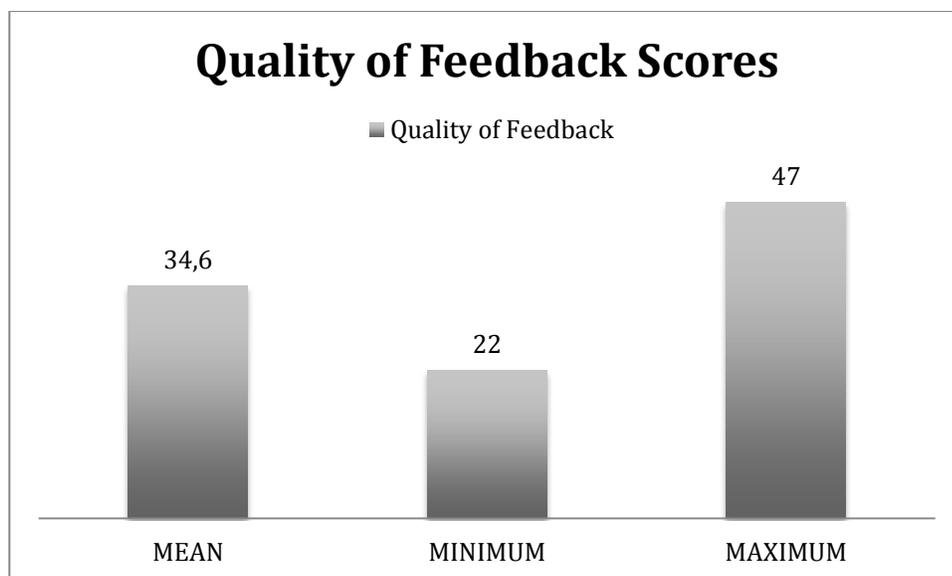
<b><i>Higher Grade</i></b>	<b><u>3.8</u></b> <i>I think that <b>giving peer feedback</b> will help me to get a higher grade for this writing assignment:</i> 1. <i>Strongly disagree</i> 2. <i>Disagree</i> 3. <i>Neither agree nor disagree</i> 4. <i>Agree</i> 5. <i>Strongly agree</i>	<b><u>4.0</u></b> <i>I think that <b>receiving peer feedback</b> will help me to get a higher grade for this assignment:</i> 1. <i>Strongly disagree</i> 2. <i>Disagree</i> 3. <i>Neither agree nor disagree</i> 4. <i>Agree</i> 5. <i>Strongly agree</i>
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**Fig. 9.** Mean scores of students’ positive pre-review vs. post-review attitude.

Finally, we analysed the results regarding the students’ perceived advantages and disadvantages of peer feedback (Q12 and 13 in the pre-review survey and Q13 and 14 in the post-review survey). The listed (dis)advantages were comparable in the pre- and post-review surveys. The most common advantage listed was that receiving peer feedback would help point out mistakes and give suggestions that could help them improve their work in order to ultimately get a higher grade. The most frequently listed disadvantage was that students felt that their peers might not be as well-qualified as their teacher to give them feedback and might give incorrect suggestions for improvement. However, the concerns that students had before taking part in peer review became less prevalent afterwards and many students were not able to name a disadvantage after having actively participated in peer review

*Quality of peer feedback given*

The quality of peer feedback was assessed according to the rubric we designed. Each of the six criteria were assessed and given a score based upon the four levels we recognized, ranging from excellent (4) to low (1), which leads to a maximum total score of 48 points. On average the students gave feedback of good quality, as illustrated by Fig. 10, which shows the mean, minimum and maximum scores of the peer feedback provided by the students.



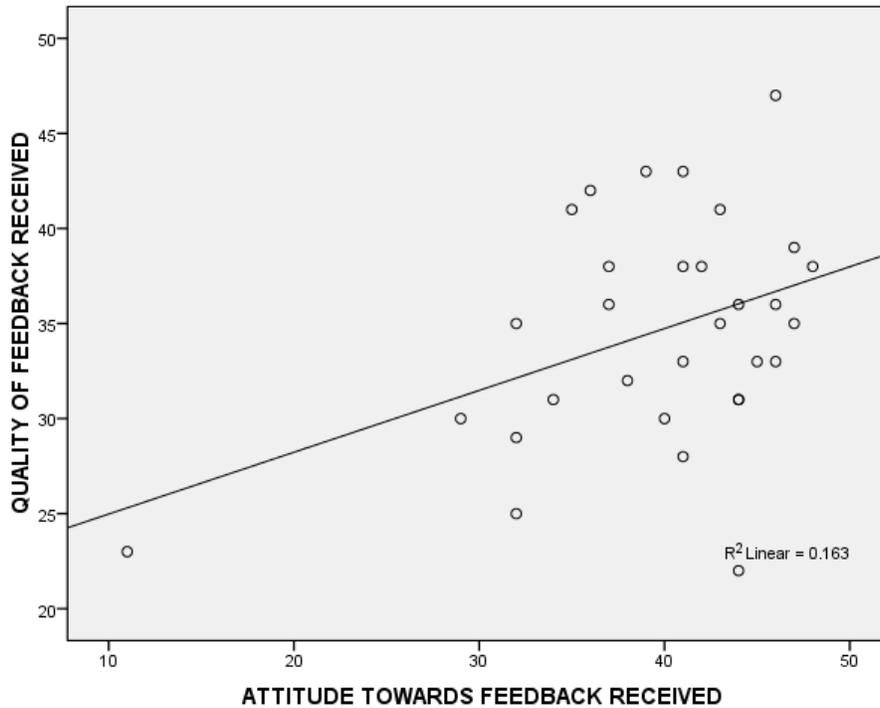
**Fig. 10.** Mean, minimum and maximum scores for the quality of peer feedback.

*Relationship between students' attitude towards giving peer feedback and the quality of the feedback they give*

A correlation analysis between the total pre-review survey scores and the quality of feedback given revealed that there is in fact no significant positive relationship between students' attitude towards peer feedback and the quality of their feedback,  $r=.19$ ;  $p>0.05$  (two-tailed). Our hypothesis that a more positive attitude leads to feedback of higher quality is therefore proven incorrect.

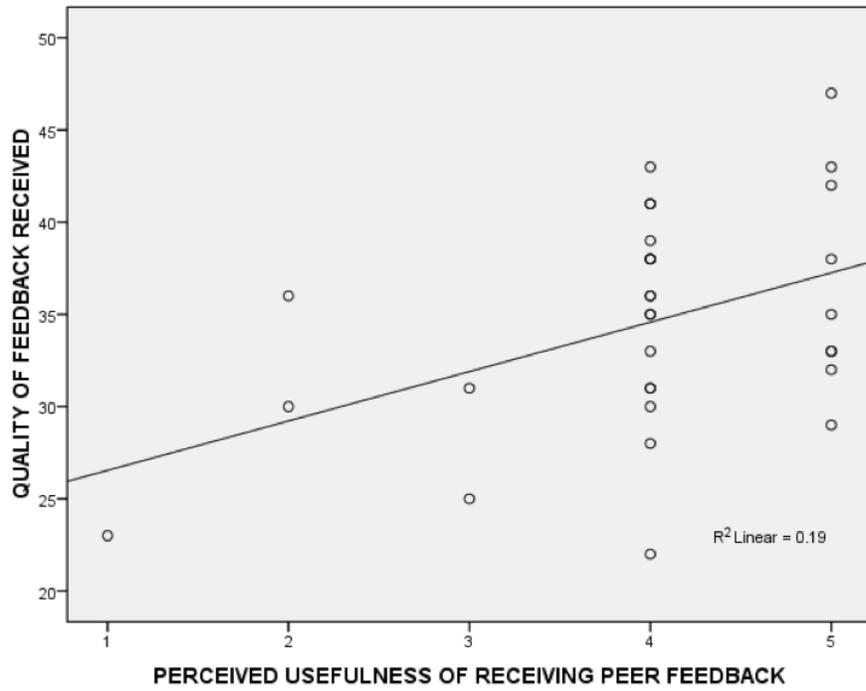
*Relationship between the quality of feedback received and students' attitude towards receiving and implementing feedback*

A correlation analysis between the total post-review survey scores and the quality of feedback received revealed a significant positive correlation between the quality of feedback received and the students' attitude towards implementing the feedback they received,  $r=.40$ ,  $p<0.05$ . This positive correlation is in perfect agreement with our second hypothesis and is illustrated in Fig. 11.



**Fig. 11.** Positive correlation between the quality of feedback received and students' attitude towards receiving and implementing this feedback.

More detailed analyses of individual post-review questions and the quality of feedback revealed that a significant positive correlation exists between the quality of feedback students received and their perception regarding the usefulness of receiving peer feedback (post-review survey Q1). The higher the quality of feedback the students received the more useful they perceived receiving peer feedback to be. This correlation is significant,  $r=.435$ ,  $p<0.05$  and is illustrated in Fig. 12.



**Fig. 12.** Positive correlation between quality of feedback received and students' perception regarding the usefulness of receiving and implementing peer feedback.

## 6. DISCUSSION & CONCLUSIONS

Is there a relationship between the attitude of students towards peer review and the quality of the feedback they give? And is there a relationship between the quality of the feedback received and students' attitude towards receiving and implementing peer feedback? To answer these questions, we must first review students' attitude towards peer feedback and the quality of the peer feedback given based upon our results.. Recommendations for using peer review in the classroom are also provided and the validity and reliability of this study are evaluated.

### 6.1 STUDENTS' ATTITUDE TOWARDS PEER REVIEW

#### *Attitude towards giving feedback*

The pre-review survey results showed that students were generally quite positive towards peer review (Fig. 8), irrespective of their experience (Fig. 3). This contrasts previous outcomes by Mulder et al. (2014) and Wen & Tsai (2006), which showed that university students with more prior experience are less positive towards participating in peer review. A possible explanation is that young secondary school learners may have had less academically demanding experiences compared to university level students, who probably have acquired more representative experience with peer feedback, including its potential pitfalls and disadvantages.

The positive attitude of students was for example shown by their relatively high expectations of the effect peer review would have on their confidence, their understanding of the teacher's expectations and their prospective grade for the writing assignment (Fig. 9). About half of the students indicated that they expected giving peer feedback to be just as beneficial to their own learning as receiving peer feedback, whereas most other students expect to learn most from receiving feedback (Fig. 5). This is in line with the expectations of participants in the study by Mulder et al. (2014).

Students generally felt confident about their ability to offer effective feedback that meets the criteria by Gielen et al. (2010) and rated their own ability somewhat higher than their peer's ability (Fig. 7). Students felt particularly confident about their ability to offer feedback that is objective, respectful, clear and specific. They felt least confident about their ability to offer feedback on content, which is not surprising considering their very limited experienced with these types of formal writing assignments.

The most frequently listed advantage of peer review in the pre-review survey is that peer review *‘helps to improve your own product and that of others’*. The main concern of students is that their peers might not be as qualified as their teacher to offer useful feedback and may simply give incorrect suggestions for improvement, which is consistent with findings by Mulder et al. (2014). These expectations of the students generally correspond to the (dis)advantages of peer feedback listed in previous studies (e.g. Leki, 1990; Liu & Hansen, 2002; Ferris, 2003; Rollinson, 2005; Mulder et al., 2014).

#### *Attitude towards receiving and implementing feedback*

As the average score for attitude was similar for both the pre- and post-review survey, students' attitudes towards peer review remained equally positive after having engaged in peer review (Fig. 8). This outcome was unexpected, since there was a decrease in the perceived value of peer review in the previous study by Mulder et al. (2014). This difference can largely be explained, however, by the fact that the university participants had very high expectations to begin with and so their perception of peer feedback as *‘very useful’* or *‘useful’* dropped from 89% to 77%, whereas in our study about 80% of the students judged peer review as *‘very useful’* or *‘useful’* in both the pre- and post-review surveys (Fig. 4).

One of the major findings is that nearly half of the students felt more confident about their work, felt that they acquired a better understanding of their teacher's expectations and believed they could obtain a higher grade after having received peer feedback (Fig. 9). This increased motivation, confidence and awareness of the assessment criteria are in perfect agreement with previous studies emphasizing the advantages of peer review (e.g. Ferris, 2003; Rollinson, 2005; Carr, 2008; Gielen et al., 2010; Ferris & Hedgcock, 2013).

The post-review survey also showed that after having participated in peer review, the students' perception of the most useful aspect of peer review did not change significantly (Fig. 5). Like in the pre-review survey most students perceived receiving peer feedback to be more useful than they expected giving peer feedback to be. This is in contrast with the study performed by Mulder et al. (2014), in which the percentage of participants who felt they learned most from giving feedback increased from 10 to 20%. Since other studies (e.g. Li et al., 2010; Lundstrom & Baker, 2009) confirm that giving feedback provides as much, if not more, learning potential than receiving feedback, it seemed plausible that the students in our study would hold

a similar view. However, given the age of the students, it may be that their cognitive and metacognitive level is not sufficient to elicit the necessary understanding, awareness and independent learning skills to realize the true benefits that are involved in *giving* feedback as well (Mulder et al., 2014).

Similar findings to our study have been obtained by Gielen et al. (2010), in which the participants were also first-year secondary school students of which only 23% recognized the learning value of *giving* feedback. The students considered *giving* feedback to be too time-consuming and an invaluable learning tool. On the other hand, a large percentage of students did not want to implement their *received* feedback either, whereas our results from Q10 and 11 of the post-review survey showed that students were very willing to implement the received feedback. When asked after the peer review process to rate their perception of their peer's ability to offer feedback, the students generally showed that the feedback they had received was of good quality and they even rated their peers abilities somewhat higher than in the pre-review survey (Fig. 7). There is a significant positive correlation between the extent to which students expected their peers to be well-qualified to provide them with critical feedback on their work and their attitude towards receiving peer feedback. In other words, the more capable students expected their peers to be of providing constructive feedback, the more positive their attitude was towards the feedback they received.

After having engaged in peer review, the most frequently listed (dis)advantages were similar to those from the pre-review survey. The most commonly mentioned advantage was that receiving peer feedback would help to improve their own work in order to ultimately attain a higher grade. The most frequently listed disadvantage of peer review in the post-review survey was the incompetence of their peer, but unlike in the pre-review survey most students were not really able to point out a disadvantage. Accordingly, similar to Mulder et al. (2014), the concerns students had in the pre-review survey are no longer as prevalent in the post-review survey.

## **6.2 QUALITY OF PEER FEEDBACK GIVEN**

Overall, the results show that the quality of the feedback scores are relatively high with students on average scoring around 70% of the maximum as assessed by the rubric for quality of feedback. On average girls provided feedback of higher quality compared to boys (Fig. 1). Surprisingly, there is no significant difference in feedback based upon the prior experience of

students (Fig. 2). Only the minimum score was significantly lower for inexperienced students compared to experienced students. This shows that even inexperienced and relatively young secondary school students can give feedback of good quality, as long as sufficient scaffolding is provided by the teacher. This study scaffolded the process by providing elaborate instructions and training, and by distributing a rubric and guiding worksheet. This outcome is in perfect agreement with previous studies (e.g. Rollinson, 2005; Ferris & Hedgcock, 2014).

### **6.3 RELATIONSHIP BETWEEN STUDENTS' ATTITUDE & QUALITY OF FEEDBACK**

#### *Relationship between students' attitude towards peer feedback and the quality of given feedback*

Contrary to our hypothesis, the results show that overall there is no significant positive relationship between students' attitude towards peer feedback and the quality of the feedback they give. In other words, how students perceive peer review does not have an effect on the quality of their feedback. The lack of a correlation between attitude towards giving peer feedback and the quality of peer feedback, may be that – as mentioned previously – the measure of success of peer review does not solely depend on students' prior experience, attitude or other individual factors, but rather on the scaffolding provided by the teacher during the process. Since our research does not assess the long-term effects of peer feedback, and does not specifically set out to measure the effect of the scaffolding tools, this goes beyond the scope of the present article and would require further research.

More detailed analyses of the individual questions of the pre-review survey show that there is a discrepancy between how students perceived their own abilities to give feedback that meets the criteria by Gielen et al. (2010) and the actual quality of their feedback. This is not surprising as most students were inexperienced and had never participated in peer review before.

#### *Relationship between the quality of the feedback received and students' attitude towards receiving and implementing the peer feedback*

Our results show that there is a significant positive correlation between the quality of feedback received and the students' attitude towards receiving the peer feedback (Fig. 11). This is in perfect agreement with our hypothesis that feedback of higher (lower) quality results in a more positive (negative) attitude towards the received feedback. This clearly shows that if feedback is of good quality peer review is a valuable learning tool, which helps to foster motivation,

confidence and awareness of the learning process among students, as shown by our results on attitude (Fig. 9) and previous studies (e.g. Rollinson, 2005; Carr, 2008; Gielen et al., 2010). On the other hand, a potential pitfall is that feedback of poor quality can result in low self-efficacy and self-confidence, which may obstruct the learning process. This again stresses the importance of proper scaffolding and training of students by the teacher before letting them participate in peer review (e.g. Sluijsmans, 2002; Rollinson, 2005; Ferris & Hedgcock, 2013). Looking at this correlation in more detail, it shows that the higher the quality of feedback the students received, the more useful they perceived receiving feedback to be (Fig. 8). The guidance towards the production of high quality feedback will therefore enhance students' perception of the usefulness of peer feedback and in turn their positive attitude towards receiving peer feedback.

#### **6.4 RECOMMENDATIONS FOR THE EDUCATIONAL PRACTICE**

Although further research would be required before significant claims can be made, our results clearly indicate that peer feedback is an effective tool to use within the classroom. Despite the limitations expressed by Mulder et al. (2014) concerning student maturity, students generally felt confident about their peers' abilities to provide useful feedback. Their attitudes towards peer review remained equally positive after having participated. , and many felt that it increased their motivation, confidence, performance and awareness of the teacher's expectations. With the proper training, guidance and scaffolding, students were able to provide feedback that met the criteria for good quality feedback by Gielen et al. (2010). Our instructions (which included a stepwise approach to giving peer feedback and showed examples of both poor and good quality feedback), guiding worksheet and rubric can be directly utilised as scaffolding tools by secondary school teachers (see Appendices) or can also be replaced by online applications like *Turnitin* if preferred. In the Dutch educational system teachers should particularly be aware to provide boys more individual guidance during the peer review process.

Once students have received proper training and have repeatedly participated, peer review will become a routine learning tool for students. Accordingly, as Rollinson (2005) also points out, students can spend more time providing feedback than an overworked teacher can and the 'turnover' time between the completion of a writing assignment and receiving feedback on it will decrease.

## 6.5 EVALUATION

### *Validity & Further research*

There are a number of factors to take into account when assessing the validity and reliability of our results. Firstly, as the number of respondents was relatively small and only encompasses Dutch secondary school students aged 13-14 years with limited experience, our conclusions should not be generalized and should be applied in different educational contexts with caution. Also, the amount of feedback students were assessed on was limited. Initially the worksheet guiding the peer review process asked students to also give marginal comments, but due to time constraints we limited the feedback to summary comments. Accordingly, we recommend that future research targets more respondents and more samples of feedback in order to generate more representative attitude and quality of feedback scores.

Another factor that may have influenced the quality of feedback is the manner in which the students were paired up for peer review. Although the study by Gielen et al. (2010) stresses the importance of the *equal status students principle*, we believed that due to their limited experience, a positive learning environment needed to be safeguarded by giving students the freedom to choose their own peer. However, in future studies that use more experienced respondents, students can be paired up with an anonymous peer of equal ability without feeling intimidated, which in turn may generate feedback of even higher quality.

The results of this study confirm the importance of scaffolding tools to guide the peer review process. However, even if the level of scaffolding strongly influences the quality of students' feedback and possibly also their attitude, it was initially not considered as a variable in our study. By giving instructions and providing a rubric and guiding worksheet the set-up of our research scaffolded the peer review process considerably, but different scaffolding would probably have led to different outcomes. For example, Carr (2008) recommends that students be actively involved in developing the assessment rubric of the assignment to create more ownership and in turn motivation. Future studies could explore the influence of different scaffolding tools on peer feedback attitude and quality in more detail by choosing the level of scaffolding as the main research variable.

Another significant limitation to our study is the approach we took towards analysing the data obtained from the pre-review and post-review surveys. To determine students' attitude towards giving and receiving peer feedback at a pre- and post-review stage we totalled the scores

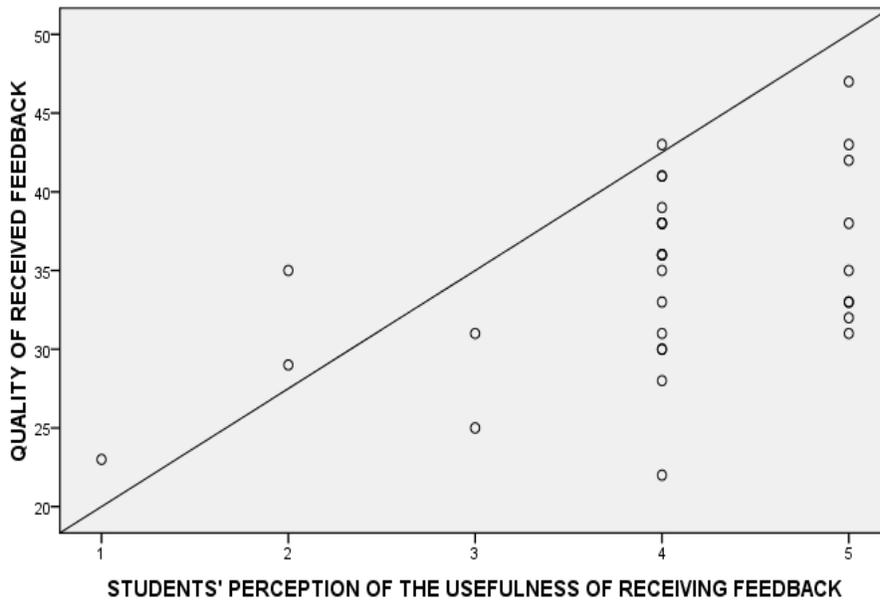
for each survey question rather than examining the survey data according to the six different categories included in our surveys (perception of usefulness, educational benefits of peer review, prior experience, perception of own ability, willingness and perception of peers' ability). We tried to account for this method by testing the internal consistency of the two surveys with a reliability test (Cronbach's Alpha) to ensure that the questions – although covering different topics – all measure the same thing, i.e. students' attitude towards peer feedback. While our post-review survey had a high degree of internal consistency and reliability ( $\alpha = .90$ ), our pre-review survey had a low Alpha score of .53 while .70 is needed in order for this survey to be considered a reliable assessment tool for gauging students' attitude (Nunnally, 1978).

However, as the questions in the surveys focused on different categories – all related to attitude – in retrospect we believe analyses based on these categories rather than the total score could yield more reliable results. Therefore, we ran additional analyses to determine the potential effects on our results of working with categories rather than a total score. The categories examine different aspects that influence students' attitude towards the peer feedback process at a pre- and post-review stage, and our analyses determined if the individual categories had a significant correlation to the quality of the feedback given and received. Here we only discuss the correlations that proved significant and therefore relevant.

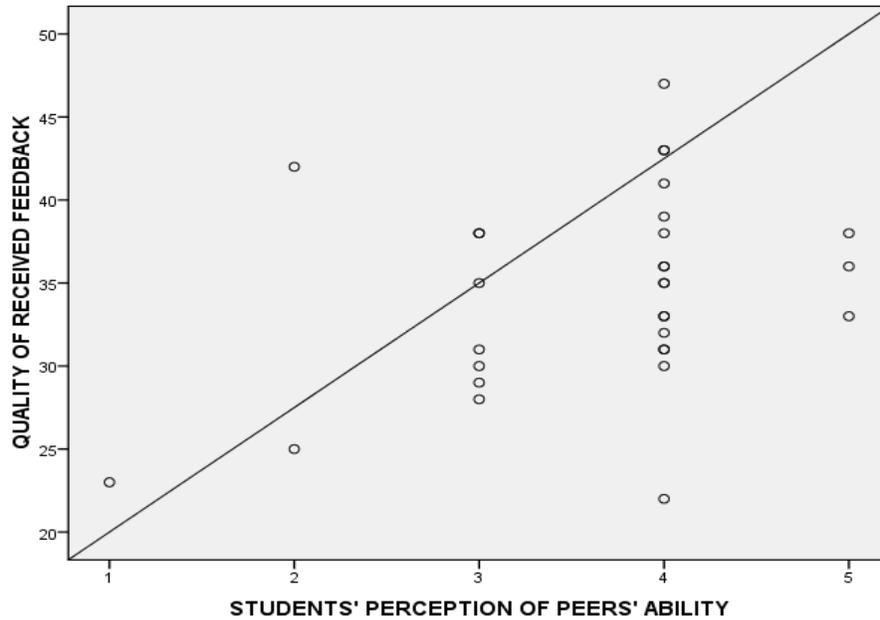
In our new analyses we found positive correlations between the quality of feedback received and students' perception of the usefulness of peer feedback (Fig. 13), and between the quality of feedback received and students' perception of their peers' ability (Fig. 14). These findings show that when the quality of the received feedback is higher, students also perceive their peers' ability and the usefulness of feedback to be higher. Perception of usefulness was assessed by a single question (Q1 of the post-review survey). Perception of peers' ability was assessed by grouping together three different questions (Q2, 5 and 6 of the post-review survey). This category can be considered a reliable representation of students' perception of peers' ability as a reliability test revealed a Cronbach Alpha score of .88.

The positive correlation between quality of received feedback and perception of usefulness is in perfect agreement with our findings shown in Fig. 12. By narrowing down the category usefulness using only directly related questions, this new positive correlation is even more significant (Fig. 13). However, the positive correlation between the quality of feedback received and attitude towards implementing feedback (Fig. 10), and quality and the students'

general attitude towards the feedback received (Fig. 11), are not directly supported by our additional analyses in relation to the relevant categories (e.g. educational benefits of peer review). On the other hand, the new analyses do show a positive correlation between the quality of feedback received and students' perception of their peers' ability (Fig. 14). One could thus conclude that our additional analysis show that of all aspects comprising attitude only the perception of peers' ability was positively affected by the quality of feedback received.



**Fig. 13.** Positive correlation between the quality of received feedback and students' perception of the usefulness of receiving peer feedback.



**Fig. 14.** Positive correlation between the quality of received feedback and students' perception of their peers' ability.

In future research we recommend to work with categories rather than total scores in order to yield more reliable data. By analysing the categories individually our data gives a clearer indication of which factors – as determined by the categories – were influenced by the quality of the feedback received, resulting in more accurate findings. When working with a total attitude score one cannot account for the degree in which individual factors could have influenced students' attitude. Additionally, working with categories enabled us to more effectively track changes in students' attitude at a pre- and post-review stage.

Finally, for further research that examines data from two different surveys we recommend that questions are all mirrored. In our surveys we distinguished between *giving* (pre-review) and *receiving* (post-review) at different stages of the research, but were not able to track changes in attitude because the same questions were not included at both stages of the research.

### *Final reflection*

The co-operation within both the school and the group has been fruitful and unproblematic throughout as we have each contributed to the various stages of this research depending on our abilities. Even if the initial stage of setting-up and designing the research was somewhat strenuous and difficult, we believe that we in the end have succeeded in providing clear answers

to our research questions, which will surely help teachers intending to use peer review as a learning tool. Finally, this research has taught us how to design, set-up and carry out a practice-based research and has shown us the importance of reflecting on one's own educational practice and its underlying processes by systematic research in a theoretical context.

## ACKNOWLEDGEMENTS

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