Students' Perceptions on Self- and Peer-Assessment in Enhancing Learning Experience

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ABSTRACT

This study reports the effectiveness of self- and peer-assessment in improving students' learning experience. Students in a group of four were required to submit two self-assessments, one after the first submission and the other during the final submission of the assignment. An anonymous assignment was then given to each group for a peer-based assessment. Students were asked to respond to the comments given in the peer-assessment and were given the chance to revise their assignment before the final submission. The results show that both self-and peer-assessments were perceived as enabling students to become more critical, work in a more structured way and think more deeply. Peer-assessment was especially highly regarded, as students felt they learned more from the given feedback and became analytical after the peer-assessment. Although most of the students felt that both the self- and peer-assessments were time consuming, they would love to have peer-assessment in their future assignment.

Keywords: *self-assessment, peer-assessment, feedback, perception, critical*

INTRODUCTION

Assessment is closely associated with student learning (Arter, 1997; Dochy & McDowell, 1997; Dochy, Segers, & Sluijsmans, 1999). Assessments were traditionally used as tools to evaluate or grade students. Traditional assessment methods are usually controlled by an instructor who sets the assessment scheme, evaluates learners' performance and learning outcomes, and provides feedback to learners to remediate their learning and improve their skills. Traditional assessment methods do not fit into the paradigm shift from teacher-centered to student-centered approach, in which the latter focuses on students' learning and "what students do to achieve learning, rather than what the teacher does" (O'Neil & McMahon, 2005). Since the main goal of higher education is to promote independent and lifelong learning, both of which help students to develop into "reflective practitioners" who are able to critically reflect upon their professional practice (Falchikov & Bound, 1989), the traditional assessment practices that provide a grade at the end of the learning process are no longer practical to help students learn. In fact, there is a strong support for representing assessment as a tool for learning (Arter, 1997).

Alternatives in assessment have received much attention in the last decade, in line with the promotion of student-centered learning in the university. Self- and peer-assessment have been introduced in higher education as alternatives in assessment as a result of the increasing demand for

lifelong and reflective learners in higher education. Self-assessment involves students in making judgments and reflection on their learning (Boud & Falchikov, 1989). It encourages active learning among students. Peer-assessment involves learners judging and evaluating the work or performance of their peers (Sitthiworachart & Joy, 2004). It may involve the use of rating instruments or checklists to meet the particular task list. A previous study shows that feedback and suggestions given by student assessors is a significant predictor of the performance of the assessors themselves and the feedback is also related to the performance of those assessed (Lu & Law, 2012). Peer grading, however, is not a significant predictor of project performance (Lu & Law, 2012).

Contemporary educational theory indicates that self- and peer-assessment allow learners to (a) actively participate in the assessment process, (b) think more deeply, (c) develop important cognitive skills such as critical thinking, teamwork, decision-making, self-monitoring and regulation, (d) problem solving, (e) get inspiration from their peers' work (f) collaborate, criticize constructively and suggest improvements (g) reflect and make sensible judgments (Sluijsmans, Dochy & Moerkerke, 1998; Sung et al., 2005). Self- and peer-assessment are examples of student-centered assessments in which some control and responsibility are given back to the learner. Self-assessment is a valid and reliable measure of communicative language ability (Bachman & Palmer, 1989; Butler & Lee, 2010; Shahrakipour, 2012). While teacher- and peer-assessments are in a high agreement (Freeman, 1995; Miller & Ng, 1994), some studies have observed otherwise (Kwan & Leung, 1996; Orsmond, Merry & Reiling, 1997). Other studies reported a low agreement between self-ratings and teacher ratings (Jafapur, 1991; Orsmond, Merry & Reiling, 1997). It has been recognized that self-assessment incurs extra time (Schunk, 1996). It requires comprehensive self-questioning and therefore less able students find it more difficult to self- or peer-assess compared to more able students (Orsmond, Merry, & Reiling, 1997; Sullivan & Hall, 1997). While peer assessment provides benefits in improving the students' understanding of the assessment process and has also been shown to play a useful role in writing classes (Matsuno, 2009), there were limited benefits in its use in relation to improving the overall student experience (Chambers, Whannell, & Whannell, 2014). Low- and high-achieving students tended to over- and underestimate the quality of their work in self-assessment, respectively (Sung et al., 2010).

A review of the literature suggests that there are no studies of the assessments in the food science settings specifically targeting written assignments. Since the basis of higher education is directed toward lifelong learning, which is difficult to achieve via traditional assessment methods, this study is aimed at determining students' perception on the use of self- and peer-assessment in enhancing students' learning experience of Fundamentals of Food Science (FST 1800).

METHODS

Subjects

Sixty two students (n = 62) who enrolled in FST 1800 participated in this study. There were 13 groups with four students a group and two groups with five students a group.

Task and Procedures

Students were asked to group themselves into four per group to work on an essay of a specific topic of their choice. The duration from preparation up to final submission of the assignment took approximately 5 weeks. Table 1 shows the duration for each task.

Table 1 Duration for Each Task in Assignment

Task	Duration (week(s))
Release of assignment topic and assignment requirement	
1st submission + self-assessment	3
Peer-assessment	1
Revision	1
Resubmission + self- assessment	

Students were given three weeks to work on their 2000 words group assignment, focused on a specific topic. Students submitted their individual self-assessment based on a provided rubric (Appendix 1) after the first submission of assignment. They were then given an anonymous assignment for peer-assessment, to be completed over another week. An evaluation rubric was provided for peer-assessment (Appendix 2). The original assignment was returned to the designated peer and the peer was allowed to make changes to the assignment. One week was then given to provide justification and make necessary changes to the assignment before the final submission, together with another self-assessment for the final submission. Table 2 shows mark allocation in percentage for each given task. The total value of this assignment was 12% from the total assessments for this unit. The instructor provided a final assessment based on the provided rubric as shown in Appendix 3.

Table 2 Mark Allocation in Percentage for Tasks Involved in Assignment

Task	Value (%)
Self-assessment	2
Peer-assessment	
Evaluation	2
Response to comments	2
Instructor- assessment	6
Total	12

Questionnaire and Students' Feedback

Sixty two students had volunteered themselves to participate in the questionnaire. Students were asked to put a tick in the questionnaire to assess the effectiveness of self- and peer-assessment in their learning. Results of the questionnaire are shown in Table 3, 4 and 5.

Statistical Analysis

One sample *t*-test was used to analyze the data using Statistical Package for the Social Sciences (SPSS) 20 software (IBM, Chicago, Illinois, USA).

Human Ethics Approval

A human ethics application was submitted to Monash University Human Research Ethics Committee (MUHREC). Approval was granted by the committee and a project number of CF13/1270 - 2013000655 was given.

RESULTS AND DISCUSSION

The majority (more than 50%) of students felt that incorporating self-assessment in their assignment makes them independent, think more, learn more, become critical, work in a structured way, and become analytical (Table 3). In fact, 92% and 82% of students felt that the self- assessment was extremely useful in helping them to think more and become analytical, respectively. A substantial percentage of students expressed no strong opinion about the self- assessment process (Table 3). Overall, self-assessment was perceived as an activity that could build on students' competency because the percentage of students who viewed self-assessment as an activity that did not enhance their learning experience was less than 10% (Table 3). The current finding was in accordance with previous findings in which students felt they were more critical, worked in a more structured way and were encouraged to think more after the self- and peer-assessment exercises (Falchikov, 1986; Orsmond, Merry, & Reiling, 2000; Shahrakipour, 2012; Stefani, 1994).

Table 3 Students' Response to Self-evaluation Questionnaire After Submission of Assignment

The self-assessment makes you:					
Dependent	8	Independent	60	Neither	32
Do not think more	2	Think more	92	Neither	6
Did not learn anything	8	Learn more	61	Neither	31
Lack of confidence	7	Gain confidence	37	Neither	56
Uncritical	5	Critical	67	Neither	28
Work in an unstructured way	3	Work in a structured way	77	Neither	20
Not analytical	3	Analytical	82	Neither	15
The self-assessment is:					
Time consuming	58	Time saving	11	Neither	31
Not enjoyable	47	Enjoyable	19	Neither	34
Hard	26	Easy	32	Neither	42
Not challenging	24	Challenging	45	Neither	31
Not helpful	11	Helpful	58	Neither	31
Not beneficial	13	Beneficial	52	Neither	35

Note. Figures indicate percentage of student responses (n = 62).

There were 58% of students who felt that having to submit two self- assessments for the assignment was time consuming (Table 3) and this was in concordance with Schunk (1996). Although self-evaluation was useful to help them to think more and became analytical, close to 50% of students felt the process was not enjoyable (Table 3). This might be due to two self- assessments designed in the current study that was time-consuming. In future, one self-assessment at the end of the final submission might be sufficient and helpful. It has been recognized that time is an important factor in implementing the self- or peer-assessment exercise (Orsmond, Merry, & Reiling, 2000). More than 50% of students felt that self-evaluation was helpful and beneficial while 45% of them felt that self-evaluation was challenging (Table 3). Orsmond, Merry, and Reiling (2000) have reported that students found the work was more challenging after the incorporation of self- and peer-assessment.

Peer-assessment was well accepted among the students as 92% of them felt that this form of interaction made them think more and learn more (89%) and become analytical (87%) (Table 4). The anonymous comments suggest that peer-assessment was more helpful in students' learning compared to self-assessment (results not shown). Peer assessment has been shown to enhance the constructive feedback giving skill (Cushing et al., 2011).

Generally, self-assessment was perceived as "biased" and students would not be able to be aware of their own mistakes in the assignment. Most importantly, 79% of the students felt that they learnt from the feedback given in peer-assessment (Table 4).

Table 4 Students' Responses to Peer-evaluation Questionnaire After Submission of Assignment

The group-assessment makes you:					
Dependent	26	Independent	34	Neither	40
Not think more	0	Think more	92	Neither	8
Did not learn anything	2	Learn more	89	Neither	9
Lack of confidence	11	Gain confidence	55	Neither	34
Uncritical	3	Critical	68	Neither	29
Work in an unstructured way	2	Work in a structured way	82	Neither	16
Not analytical	3	Analytical	87	Neither	10
Did not learn from my peers' evaluation	4	Learn from my peers' evaluation	79	Neither	17
The group-assessment is:					
Time consuming	43	Time saving	31	Neither	26
Not enjoyable	23	Enjoyable	44	Neither	33
Hard	21	Easy	46	Neither	33
Not challenging	18	Challenging	62	Neither	20
Not helpful	8	Helpful	79	Neither	13
Not beneficial	7	Beneficial	82	Neither	11

Note. Figures indicate percentage of student responses *(n = 62)*

Similar to self-assessment, a substantial percentage of students were neutral toward Peer-evaluation. Twenty six percent of students actually felt that peer-assessment made them become dependent. This was probably because students had been relying on the peer-assessment to improve on their assignment, therefore making them "dependent". Eleven percent of students actually felt that peer-assessment resulted in loss of confidence. This might be because some students gave a penetrating criticism and non-constructive comments in the peer-assessment, thereby demolishing the confidence level of the recipients.

The majority of students (82% and 79%, respectively) perceived peer-assessment was beneficial and helpful, similar to that of self-assessment. The percentage of student, however, was higher ($p < .05$) than that of the percentage for self-assessment (Table 3 & 4). Some 62% of students found peer-assessment challenging while 46% and 44% felt that peer-assessment was easy and enjoyable, respectively. However, 43% of students found peer-assessment rather time consuming. This percentage of students who found peer-assessment time consuming was slightly lower compared to the percentage for self-assessment ($p < .05$) (Table 3 & 4). A recent study shows that assessment training is helpful in developing student assessment skills for peer-assessment (Liu & Li, 2014), suggesting that training is essential to prepare students with critical assessment skills and to assist them in switching roles from learners to assessors.

Overall, peer-assessment was well-accepted and was deemed to be more helpful in students' learning compared to self-assessment ($p < .05$) (Table 5).

Table 5 Students' Responses to Overall Evaluation Questionnaire after Submission of Assignment

Which is helpful for your assignment?					
Self- evaluation	2	Group- evaluation	53	Self- and group- evaluation	45
In future, you would like your assignment					
To have both self- and group evaluations	17	Self- OR group- evaluation	67	Neither self- nor group- evaluation but direct submission	16
The marking rubric for both self- or group- evaluation is					
Not helpful	8	Helpful	81	Neither	11
The quality of assignment has been improved after going through self- evaluation					
Agree	66	Disagree	8	Neutral	26
The quality of assignment has been improved after going through group- evaluation					
Agree	92	Disagree	5	Neutral	3

Note. Figures indicate percentage of student responses *(n = 62).*

Students were hoping to have either self- or peer-assessment in their future written assignment (Table 5), indirectly indicating that both assessments facilitated student learning although they might be time consuming. These findings show the positive perception of students to using self- and peer-assessment in their assignment. As suggested by Nulty (2010), self- and peer-assessment should be used in first year university life. The current result is in accordance with a recent study that shows both self- and peer-assessment of oral presentation are helpful in providing formative feedback (De Grez, Valcke, & Roozen, 2012) and improve oral presentation skills (Dollisso & Koundinya, 2011). In the current study, the marking rubric was perceived as essential to support both self- or Peer-assessment (Table 5).

CONCLUSIONS

Students felt they were more critical, worked in a more structured way and were encouraged to think more after the self- and peer-assessment exercises. Peer-assessment was overall well accepted among students as they felt that peer-assessment in their assignment made them think more. Students learnt more from the given feedback and became analytical after the peer-assessment. Time consuming is the main concern for students but this had not discouraged their need for self- or peer-assessment in students' assignment. Through self- and peer-assessment, students think more and become analytical, both of which are important graduate attributes.

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APPENDIX 1

Rubric for self-assessment

Self evaluation (5 Marks)

Comments	Agree	Disagree	Neutral	Comments	Suggestions
The provided title matched with the content of the assignment (0.25 M)					
Composition of the food product/Peer has been clearly described with great detail (0.5M)					
Fundamental science of the food composition is well-related to the quality and variety of food product (0.5M)					
Changes of food /product upon storage conditions have been clealy described and alternative(s) to control the changes are discussed (0.5M)					
A conclusion/summary that gives an overall “conclusive remark” is provided (0.25M)					

Comments	Agree	Disagree	Neutral	Comments	Suggestions
The assignment is well-presented & organized (0.25M)					
The grammar and spelling of this assignment is of a high standard (0.25M)					
The assignment has met the word count of 2000 words ± 10% (0.25M)					
The in-text citation and reference list of this assignment follow a consistent reference format (0.25M)					

1. **Comment on the overall strength(s) of this assignment. Give example(s). (1 M)**

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2. **Comment on the overall weakness(es) of this assignment. Give example(s). (1 M)**

APPENDIX 2

Rubric for peer-assessment

Peer evaluation (10 Marks)

Please provide justification for each of your responses.

Comments	Agree	Disagree	Neutral	Allocated mark (by Peer)	Justification/Suggestion	Response to justification/suggestion	Allocated mark (by instructor)
The provided title matched with the content of the assignment (0.5 M)							
Composition of the food product has been clearly described with great detail (1M)							
Fundamental science of the food composition is well-related to the quality and variety of food product (1M)							
Changes of food product upon storage conditions have been clearly described and alternative(s) to control the changes are discussed (1M)							
A conclusion/summary that gives an overall “conclusive remark” is provided (0.5M)							

Comments	Agree	Disagree	Neutral	Allocated mark (by Peer)	Justification/Suggestion	Response to justification/suggestion	Allocated mark (by instructor)
The assignment is well-presented & organized (0.5M)							
The grammar and spelling of this assignment is of a high standard (0.5M)							
The assignment has met the word count of 2000 words ± 10% (0.5M)							
The in-text citation and reference list of this assignment follow a consistent reference format (0.5M)							

1. **Comment on the overall strength(s) of this assignment. Give example(s). (1 M)**

Response to the comment:

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2. **Comment on the overall weakness(es) of this assignment. Give example(s). (1 M)**

Response to the comment:

APPENDIX 3

Rubric for instructor-assessment

Instructor evaluation & feedback (20 Marks)

Comments	Agree	Disagree	Neutral	Justification/Suggestion	Allocated mark
The provided title matched with the content of the assignment (2 M)					
Composition of the food product has been clearly described with great detail (4M)					
Fundamental science of the food composition is well-related to the quality and variety of food product (4M)					
Changes of food product upon storage conditions have been clealy described and alternative(s) to control the changes are discussed (4M)					
A conclusion/summary that gives an overall “conclusive remark” is provided (2M)					
Total (??/16)					

Comments	Agree	Disagree	Neutral	Justification/Suggestion	Allocated mark
The assignment is well-presented & organized (1M)					
The grammar and spelling of this assignment is of a high standard (1M)					
The assignment has met the word count of 2000 words ± 10% (1M)					
The in-text citation and reference list of this assignment follow a consistent reference format (1M)					
Total (???/4)					
Grand total (??/20)					

Overall mark

Self–assessment 1 (5 marks) (1%)	Self-assessment 2 (5 marks) (1%)	Peer-assessment (review) (8 marks) (2%)	Peer-assessment (response) (8 marks) (2%)	Instructor-assessment (20 marks) (6%)	Total mark (12%)

Overall strength(s) of this assignment.

Overall weakness(es) of this assignment.
