

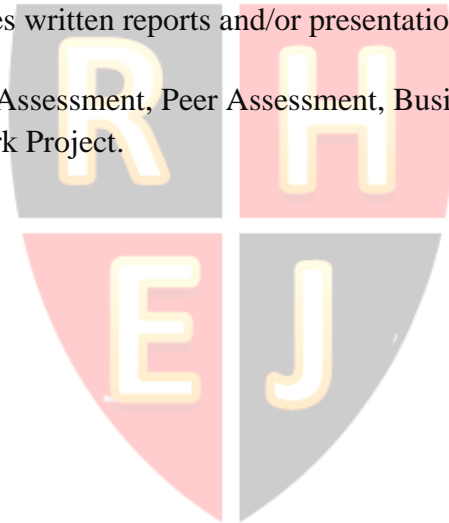
## **Integrating teacher- and peer-assessments of group coursework assignments in business education: Some innovative methods**

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### **ABSTRACT**

This paper is a sequel to an earlier one that examines “the efficacy of two innovative peer-assessment templates (*PET* and *PACT*) introduced to enable students provide evidence of their fairness in evaluating peer contributions to group project work” (Onyia, O. P. and Allen, S., 2012). In the present paper, three innovative methods of integrating peer- and teacher-assessments are introduced and discussed, including the *equal weighting integration (EWI)*, the *unequal weighting integration (UWI)*, and the *peer modulation integration (PMI)* methods - all of which can help a college teacher in any area of business or social science education to combine his or her own assigned scores with those from students’ peer-assessments (PA) of the group work in order to achieve a fairer final grade for each student in a group coursework assignment (GCA) that involves written reports and/or presentations.

Keywords: Higher Education, Assessment, Peer Assessment, Business Education, Coursework Assignment, Group Coursework Project.



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## INTRODUCTION

### **The Role of Group Coursework Assignments in Business Education Curriculum**

Group Coursework Assignments (GCAs) usually involve students studying and learning in class- sizes of about 12 to 18 students (Bean 1996; Light and Cox 2004) or in smaller seminar groups (also known as teams) of about 5 to 6 members per group (Atherton 2005). The effectiveness of GCA as a method of student-centered learning in business education cannot be overemphasized. It encourages collaborative learning among students (Li, 2001). It engenders a “student-controlled” learning environment (Schelfhout et al. 2004). It also enhances “individual accountability and positive interdependence” amongst students (Prins et al. 2005). It helps students in “undertaking substantial project work” (Atherton 2005).

Existing research also indicates that students learn more from each other when they work in small collaborative groups by studying educational materials, critically analyzing theories, writing up reports, making presentations, and assessing each other’s contribution to the group work (Van den Berg et al. 2006; Almond 2009). Moreover, Johnston and Miles (2004) are of the opinion that when students work on coursework projects in small groups, it helps them to “open up to their peers’ points of view; to develop more comprehensive assignments and projects that are not possible for one individual alone to achieve; to develop interpersonal and teamwork skills such as communication, leadership, planning and time management skills that will enhance their employability; and also to develop role-playing skills necessary for teamwork and active group-based learning.”

From an industrial practice perspective, the acquisition of the requisite knowledge and skills for successful employability requires that students be imbued with creative-thinking and problem-solving abilities, as well as skills of written and oral communications, report writing, and business presentations. These skills are essential because professional practice in most aspects of business (especially marketing) requires the generation of reliable information and creative ideas that are aimed at solving internal and external organizational problems that will enhance the market potentials and competitiveness of the business. The pieces of information, often garnered through extensive market research, are vital for sound business decision-making; while the creative ideas, often generated through extensive brain-storming sessions, are used in solving huge customer-related problems in the market place.

The ideas and decisions thus generated must be produced, documented, and properly presented to the management (and, sometimes, the board of directors) before being transformed into products and services worth millions of dollars in the market. Not only does the production and marketing of such products and services cost huge sums of money, even the generation of market information and creative ideas is also very costly. No one individual undertakes any of such activities alone in the industry. They are usually undertaken as group-tasks and achieved through interdepartmental collaborative efforts. Acquiring the relevant academic knowledge and practical skills necessary for such industrial accomplishment therefore requires that business education institutions infuse practice-centered learning and student-led group project assignments in the educational curriculum of their business programs. Hence, group learning through group coursework assignments (GCAs) in small-size groups or teams is a fundamental pedagogical method in business education, and has been employed extensively in most areas of the business discipline (see Freeman, 1995).

## Employing peer-assessment in group coursework assignment (GCA)

Quite a number of scholars have argued in favor of involving higher education (HE) students in the assessment of their own coursework by incorporating peer assessment (PA) in the curriculum. For examples, Race (2001) is of the view that including self and peer assessments in curricula assessment legitimizes what students already do instinctively on their own, and helps them to do it a lot more efficiently. Freeman (1995, p. 289) asserts that peer assessment promotes “independent, reflective and critical learning” among students. Ellis (2001) adds that peer assessment improves critical thinking and group assertiveness. Moreover, a study by Pope (2005) confirmed that peer assessment ensures greater student participation in the learning process.

However, in employing peer assessment, HE teachers have often taken the easy way out by multiplying the score they have given to each team for a group assignment by the number of students in that team and asking each member to redistribute the total among members of the team according to his/her perception of each member’s contribution. This “pie-slicing” method (Buchanan 2004, p. 172) of peer-reviewing the teacher’s assessment of GCAs has been integrally designed into some institutions’ curricula in line with the recommendations of Lejk et al. (1996), Gatfield (1999), and Johnson and Miles (2004). However, as the name implies, it is only a “review” of the teacher’s assessment by the students, not a proper peer-assessment method. This paper argues that this peer-review process makes nonsense of the teacher’s own evaluation of the whole work because by allowing students to allot the teacher-assigned scores as they like, it usurps and distorts the teacher’s judgment and evaluation of the whole work done. This author is in favor of the use of peer assessment to modulate and enhance teacher assessment, but not to replace it entirely by relinquishing the teacher’s normative judgment to the students.

In some cases also, students’ peer assessments have been used merely for formative evaluation purposes and hardly counted toward the final summative-assessment grades of the coursework, but as Race et al. (2005, p. 135) rightly observe, “if students are to take peer assessment seriously, it should count for something, even if only a small proportion.” Teachers therefore need to make more and better use of peer-assessment scores as part of their summative-assessment grades. The curricula implication of employing peer assessments by using student-assigned scores in combination with teacher-assigned scores for summative grading is that while it is ideal for a teacher to evaluate and award marks for the end-product(s) of a GCA, including the written reports and presentations; the students are in a much better position to evaluate the work preparation process, much of which takes place outside the classroom and in the absence of the teacher. Peer assessment (PA) is, therefore, a vital modulator of teacher-assessment in the evaluation of student skills development attainable through group coursework.

Furthermore, this author’s experience has shown that while teachers are aware that they can make better use of students’ peer assessments by assigning weights to them and combining them with their own weighted scores, the problem that makes some teachers take the easy way out by using the above-mentioned “review” process is the time-consuming task of calculating the weights of the peer-assessment scores, calculating the weights of their own scores, and combining them to obtain a final grade for each student in the class. The aim of this paper is therefore to make the teacher’s life less cumbersome by presenting three innovative and easy methods of integrating teacher- and peer-assessment scores to arrive at a final and fairer grade for each student in a group project assignment. Table 1 (see Appendix), which contains hypothetical peer-assessment results, has been provided to show how the peer-assessment scores for each student-group in a GCA should be summarized. Preparing such a table in Excel

Spreadsheet and using the “Formulas” tool will also help the teacher to arrive at the totals and averages automatically. Data from this hypothetical table have also been used in all the examples provided for the three integration methods proposed in this paper. Any of the three methods can be employed after using the PET and PACT tools introduced by Onyia and Allen (2011) for conducting a full and proper peer-assessment of a group coursework projects.

## INTRODUCING THE THREE INNOVATIVE INTEGRATION METHODS

### The Equal Weighting Integration (EWI) Method

The EWI or “50-50” integration method involves an equal weighting of the teacher- and peer-assessments of a GCA. This equal weighting means that equal importance is attached to both the student-led/student-evaluated out-of-class preparation and production processes of the GCA and the teacher-evaluated end-products such as the final written reports and/or presentations. As aforementioned, so much of the real preparation work that culminates in the written reports and presentations of a GCA tend to be student-led and also takes place outside the classroom and behind the teacher. This justifies the need to involve the students in the assessment of their GCA, and also to vest them with the full responsibility of evaluating those aspects of the work that take place behind the teacher. Both the work preparation process (student-evaluated) and the end-products (teacher-evaluated) may or may not be considered equally important in the overall summative assessment of the coursework. However, if the teacher considers them to be of equal importance, then the EWI method should be used. There are two equalization procedures that can be followed when employing this method:

#### *Equalization for a GCA with individual reports and/or individual presentations*

Where the GCA ends with individual reports and/or individual presentations, the teacher’s score for each student’s report/presentation should simply be added to the average PA score he/she has received from his/her peers and then divided by 2 in order to determine the student’s final grade.

Example:

- (i) A student named Johnson scored 94 in the teacher’s assessment of his individual report and presentation.
- (ii) From table 1, he also scored 88, 95, 85, 90, and 92 from his 5 peers in their 6-man group.
- (iii) Calculate his average PA score from the peer assessment (see table 1, appendix):
 
$$\frac{88 + 95 + 85 + 90 + 92}{5} = \frac{450}{5} = 90$$
- (iv) Add his teacher-assigned score to his average PA score and divide the sum by 2:
 
$$94 + 90 = 184 \div 2 = 92$$
- (v) Johnson’s final grade for the group project work is 92.
- (vi) Perform similar computations for all other members of the group.

***Equalization for a GCA with group reports and/or group presentations***

Where the GCA culminates in group reports and/or group presentations, there are at least two ways to go about combining the teacher- and peer-assessment scores in order to arrive at the final grade for each student. If only a group report or a group presentation (i.e., one end-product) is involved, simply note down the teacher’s grade for each group. However, if both group reports and group presentations (i.e., two end-products) are involved, add the teacher’s marks for both as the group grade for each group. Then compute the final grade for each student in the group by using either of the two options below.

**Option 1.B.1: Assuming the teacher-assigned group-grade as each person’s score**

- (i) Regard the teacher’s group-grade as each member’s score from teacher-assessment.
- (ii) Calculate the average PA score for each student in the group as shown in table 1.
- (iii) Add the teacher’s individual score (i.e., the group grade) to each student’s average PA score and divide by 2, as explained in the first example above.

Example:

To calculate Michael’s final grade using this option with his PA scores from table 1 (appendix):

- (i) Take the teacher’s group grade for Group C’s written report and presentation to be 85.
- (ii) Each member in the 6-man team is therefore assumed to have scored 85 in the teacher’s assessment.
- (iii) Michael’s average PA score =  $\frac{90 + 95 + 70 + 80 + 90}{5} = \frac{425}{5} = 85$
- (iv) The final grade for Michael =  $85 + 85 = 170 \div 2 = 85$
- (v) Perform similar computations for all members of the group.

**Option 1.B.2: Not assuming the teacher-assigned group-grade as each person’s score**

- (i) For each group, divide the teacher’s group grade by N, where N is the total number of students in the group. Regard the result as A.
- (ii) For each student in the group, divide his/her total PA score by N. Regard this as B.
- (iii) Add A and B together and regard the sum as C.
- (iv) C is the final grade for the individual student.

Example

To calculate Tony’s final grade using this option and his PA scores from table 1 (appendix):

- (i)  $A = 85 \div 6 = 14.17$
- (ii)  $B = \frac{90 + 90 + 85 + 80 + 90}{6} = \frac{435}{6} = 72.5$
- (iii)  $C = A + B = 14.17 + 72.5 = 86.67$
- (iv) Tony’s final grade is therefore 86.67

### **Implications and advantages**

All the assessment integration techniques explained under the EWI method above are ways of equalizing the teacher and peer assessment scores where equal importance has been placed on both the work-process and the end-product(s) of the GCA. For a GCA with group reports and/or group presentations, option B2 tends to equalize the teacher- and peer-assessment marks better than option B1 because it equalizes the averages of both the teacher's group mark and the peer-assessment scores, while option B1 only produces a simple average between the tutor's full, untouched group mark and the average PA score. By not assuming the teacher-assigned group-mark as each student's grade from teacher assessment, option B2 also increases the ability of the peer-assessment process to deal with "free riders".

### **The Unequal Weighting Integration (UWI) Method**

The UWI method indicates that the teacher-assigned scores and the peer-assessment scores are not equal, whether or not the GCA involves group or individual end-products. In the case, the teacher's marks are weighted higher than the peer-assessment marks. Teachers could employ variations of this method, depending on the ratios of the importance they attach to the assessments of the work-process and the end-products of the GCA. Giving a negotiated weighting to peer assessment, rather than just asking students to share the teacher's own group mark, will afford the students a sense of genuine importance of the group work process and also a recognition of the fact that their involvement in the whole assessment process is not just an exercise in futile formality. Although teachers may use any weighting ratios they choose to, two options are suggested here, including the 70-30 and the 60-40 options. This means that the teacher's grades are weighted 70% or 60% respectively, while the peer-assessment grades are weighted 30% or 40% respectively.

These ratios are proposed because, even though Race et al. (2005, p. 135) aver that students will be more serious with peer assessment "even if only a small proportion" of it contributes to their final grade, it is strongly advised (based on this author's experience) that to get students fully and actively engaged in proper peer assessment, what it contributes to their final summative grades should be substantial rather than paltry. The author's experience has shown that if the PA counts for only a meager portion of their final grade (say 10%), they are likely to take it just as usuriously as they would if it did not count for anything. Hence, while the teacher's assessment should have a larger weighting ratio than the peers' assessments because the end-products of a GCA are often perceived to be more important than the preparation process, it is strongly advised that the preparation process is also important enough to merit a substantial assessment weighting. This paper therefore proposes that, to make peer-assessment more meaningful to students, it should count for at least 30% of a student's final grade in a GCA.

#### ***Option 2.1 - The 70-30 Integration Technique***

- (a) Regard the teacher's group-grade for the GCA as each individual's grade from teacher-assessment (or simply note down each student's grade if the teacher has awarded individual grades for the end-products).
- (b) Calculate the 70% weighting of each student's teacher-assigned grade by multiplying the grade by 0.7.

- (c) Calculate the student's average PA score as shown in table 1 above.
- (d) Calculate the 30% weighting of the student's average PA score by multiplying the score by 0.3.
- (e) Add the two weighted scores to obtain the student's final grade.

Example:

(To calculate Becky's final grade using this option and her PA scores from table 1):

- (i) Teacher's group-score = 85 (now assumed as Becky's individual mark).
- (ii) 70% weighting of Becky's score from the teacher's assessment =  $85 \times 0.7 = 59.5$
- (iii) Becky's average PA score = 90 (from table 1).
- (iv) 30% weighting of Becky's average PA score =  $90 \times 0.3 = 27$
- (v) Becky's final grade =  $59.5 + 27 = 86.5$

### ***Option 2.2 - The 60-40 Integration Technique***

Follow the procedure detailed in option 2.1 above, using 60 in place of 70 and 40 in place of 30.

Example:

(To calculate Sarah's final grade using this option and her PA scores from table 1):

- (i) Teacher's group mark = 85 (also assumed as Sarah's individual mark).
- (ii) 60% weighting of Sarah's mark from the teacher's assessment =  $85 \times 0.6 = 51$
- (iii) Sarah's average PA score = 83 (from table 1)
- (iv) 40% weighting of Sarah's average PA score =  $83 \times 0.4 = 33.2$
- (v) Sarah's final grade =  $51 + 33.2 = 84.2$

### ***Implications and advantages***

It is worthy to note that for the UWI method, the higher the teacher's assessment weighting, the more the technique will give higher final grades to students who score highly in the teacher-assessment marks, while the reverse will also be the case for those who score poorly in the teacher-assessment marks. This not only emphasizes the higher importance placed on the end-products of the GCA (i.e., written reports and presentations) than the work preparation process, but also reaffirms the teacher's evaluative supremacy, which cannot and should not be relinquished entirely to students under any peer-review pretext. This method as a whole therefore rewards students who perform better in the teacher's estimation with higher final grades than those who do not. For instance, compared to Sarah's final grade above, a student who scores 70 in the teacher-assessment and 90 in the peer-assessment will have a final grade of  $(42 + 36) = 78$ .

### **The Peer Modulation Integration (PMI) Method**

This is an innovative and better alternative to the "pie-slicing" method of peer review. It is a review method all right, but not about students being made to share the teacher's marks. Rather, it entails students being actively involved in the evaluation of their peers' contribution to the GCA and awarding them marks as deemed appropriate. However, the PMI or modulation method should only be used where the GCA involves group written reports and/or group presentations, and the teacher has awarded group grades rather than individual grades. If

individual reports and/or individual presentations are involved, the teacher- and peer-assessments should be integrated using any of the procedures previously described in the equal or unequal weighting integration methods.

***The PMI or Modulation Procedure***

- (a) Multiply the teacher’s group mark by the number of students in the group to obtain the cumulative teacher-assessment total for the group.
- (b) Conduct a full peer-assessment exercise and prepare a summary table for each group as shown in table 1. Ensure consistency of grading (marks awarded over 50 or over 100) within and across all groups.
- (c) Calculate each student’s average PA score (as shown in table 1).
- (d) Add up all the students’ average PA scores to obtain the cumulative peer-assessment total for the group (as shown in table 1).
- (e) To obtain each student’s final modulated grade, divide his/her average PA score by the cumulative peer-assessment total for the group and multiply the result by the cumulative teacher-assessment total.

Example:

(To calculate Nicole’s final grade using the modulation method and PA scores from table 1):

- (i) The cumulative teacher-assessment total =  $85 \times 6 = 510$
- (ii) Nicole’s average PA score = 88
- (iii) The cumulative peer-assessment total = 523
- (iv) Nicole’s final modulated grade =  $\frac{88}{523} \times \frac{510}{1} = 86$

***Implications and advantages***

The major implication and advantage of the modulation method is that both the teacher- and peer-assessment scores modulate each other and produce the most ideal grade for each student. The method is therefore better than multiplying the teacher’s group mark by the number of students in the group and asking students to share the total, as many teachers often do in the “pie-slicing” review (Buchanan 2004, p. 172). It also eliminates the flaw implicit in assuming the teacher-assigned group-mark as each individual student’s grade. It lets everyone “reap according to how they have sown” in the GCA, instead of rewarding hard workers and “free riders” equally, which both the assumption of group mark as individual grade and the simple averaging of teacher-assessment and peer-assessment scores are guilty of. As a result, the modulation method is also better than the method of computing a simple average between the teacher-assigned score and the peer-assessment score.

**CONCLUSION**

In this paper, a critical review of teacher- and peer-assessment integration issues pertaining to group coursework in business education curriculum has been presented. As a contribution toward modifying the flaw discovered in the use of ‘peer reviews’ for assessing group-project assignments in college-level business education, three broad methods of integrating teacher-assessment scores and peer-assessment scores as better alternatives to the



existing peer-review process have been introduced. These include the EWI, the UWI, and the PMI methods. By explaining how these integration methods can be employed, this paper has also demonstrated a strong support for the increased and meaningful involvement of higher education (HE) students in the active peer assessments of their group coursework assessments, as previously proposed by Race (2001) and Pope (2005). Evidence from the literature has shown that engaging students in the active assessments of their coursework is vital for the enhancement of student-centered learning (Li 2001; Light and Cox 2004) and also the development of higher-level cognitive skills alongside valuable transferable skills that ultimately boost students' employability (Michaelsen 1992; Lejk and Wyvill 2002).

Indeed, from practical experience, this author is confident that HE teachers who test and adopt any of the three assessment integration methods proposed in this paper will find it useful for active and effective integration of peer assessments into the summative assessment process of their courses that involve group assignments. This is because it will give their students a stronger sense of involvement and confidence in the rational evaluation of their coursework. Lastly, it is advised that any of the methods or options adopted should be clearly incorporated into the curriculum and syllabus documents of the course. It should also be properly explained to, and negotiated with, the students. This is essential in order to elicit the students' full cooperation and appreciation of the entire coursework assessment as an equitable and agreed evaluation process.

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**APPENDIX**

**Table 1: Hypothetical Peer Assessment Summary for ‘Group C’**

	Assessor \ Assessed	Johnson	Michael	Tony	Becky	Sarah	Nicole	Total PA score	Average PA score
1	Johnson	-	88	95	85	90	92	450	90
2	Michael	90	-	95	70	80	90	425	85
3	Tony	90	90	-	85	80	90	435	87
4	Becky	95	85	95	-	90	85	450	90
5	Sarah	85	70	80	92	-	88	415	83
6	Nicole	95	90	90	80	85	-	440	88
Cumulative Peer Assessment Total for <i>Group C</i>									523

NB: Data from this hypothetical table have been used in all the examples of the proposed integration methods in this paper.