Assessment of Group Work: Summary of a Literature Review

This resource reports a summary of literature describing the assessment of group work in higher education. Five peer-reviewed articles[1-5] were selected, based on the inclusion criterion was that the article provided a description of group work assessment. In addition, an unpublished resource on group assessment[6] was consulted and results of a meta-analysis comparing teacher and peer evaluation[7] was included. Abstracts of the articles reviewed are provided in appendix 1, to guide further reading.

The main features that emerged from the literature were that group work is viewed as a valuable learning method; that the main problem regarding the assessment of group work is fairness in mark allocation of individual contributions; that a method to increase fairness in mark allocation is to separate the marks for group product and group process; that peer evaluation is used widely to determine and manage individual contributions to the group tasks. Variable weighting of product: process marks are reported. One source suggested that group assessment marks should not exceed 30% of students' year marks.

Group work is a valued learning method

There is consensus in the literature reviewed that group work is viewed as a meaningful and valued learning method.[1-5] The value of group work is that students learn to function in groups;[3,4] that group work enhances experiential learning of group dynamics;[2] that students learn professionally related interactive skills[1-4] and collaborative problems solving skills;[3,4] and that it saves staff time and effort.[1,2] In group work, students learn from each other and learn to share ideas by justifying and defending their views.[3,4] Furthermore, small group learning is reported to enhance student learning by leading to greater retention[1].

Assessment of group work is inherently challenging

Problems associated with group work assessment are also widely reported.[1-5] The most commonly reported problems are the lack of fairness in assessing individual contributions to the group product;[2-4] weighting of group process vs. group product marks;[2,3] the reliability of peer evaluations;[2,3] the management of non-contributing students;[1,2,4] and students' resentment of the lack of fairness in group assessment where non-contributing peers is not managed.[1,4] Furthermore, problems related to issues of diversity are described.[1,3]

Methods of assessment of group work reported in the literature:

Method of separating the marks for process and product

Group work assessment methods described range from simply assigning one mark to all group members on the one hand, to assigning individual student marks for individual contributions on the other hand.[5] The most commonly reported assessment method is the practice of giving separate marks for the group process and the final product,[1-5] usually where the lecturer assigns the mark to the end product and individual students' contributions are evaluated by peers in their

group. The final mark then is a weighted combination of the lecturer's mark for the product and the mark derived from peer evaluation of the group member's participation in the process. Variable weightings of the process and product are reported,[1-3] ranging from 20%:80%[4] to a lecturer: peer rating of 2:1.[3]

Variations of the method of separate marks for process and product

Variation 1: The lecturer assigns one mark to the group and the members of the group then divide the mark between themselves in terms of individuals' relative contributions to group product.[1,3,5] For example, if a mark of 70% is assigned to the group product of a group consisting of four members, the total mark of 4 x 70= 280 is divided by the students to indicate individuals' relative contributions.

Variation 2: A formal peer assessment method is employed which arrives at a quantitative measure of each individuals' contribution. This quantitative measure is used as weighting factor by the lecturer to allocate individual marks to each student.[1,3,5]

Variation 3: The task contains a mixture of individual work and group work. The student's final mark is a combination of individual and group product marks.[5]

Variation 4: A group work product submission is preceded by submissions of individual aspects of the group task for marks,[4] or the group work product is submitted for formative assessment with feedback but without mark allocation. Students submit individual work for marks.[4]

Peer evaluation

The method of using peer evaluation to assess individual members' contribution or participation is reported in the literature.[1-5] A variety of peer evaluation methods are reported.[1-5] Typically, students rate their peers numerically on specified criteria (see appendix0. Each student is rated by all other peers in the group. The marks are totaled and averaged. The student's final individual mark consists of a combination of the average peer rating plus the lecturer's mark for the final product.[2-4] If any peer mark is significantly different from the other peers' marks, the lecturer and the group members meet to discuss the discrepancy and to obtain consensus.[5]

Reliability of peer evaluation

The reliability of peer evaluation remains contested.[2,7] A meta-analysis of studies comparing peer and teacher marks revealed that peer evaluation showed a close resemblance to teacher evaluation under certain conditions, i.e. when the peer evaluation required a global judgement based on clearly understood criteria, when students were familiar with and felt ownership of assessment criteria and when academic products or processes were assesses rather than professional practice.[7] Furthermore, no difference were evident between senior and junior students or across subject areas, except in medical related subjects where a tendency of less agreement was evident.[7] A mean correlation of 0.69 indicated evidence of agreement between peer and teacher marks on average under certain conditions.[7]

Fellenz[2] describes the use of a mathematical formula to derive marks from peer evaluation as a way of enhancing reliability of peer evaluation. The *Group Work Peer Evaluation Protocol*[2(p573)] is a method in which each group member submits a quantitative evaluation of their group members' relative contribution. To derive the individual weighting factor, peer evaluation marks are calculated by applying a mathematical formula.[2]

Management of non-contribution of individuals in a group

Reasons for not participating equally

Non-contribution of individuals, referred to as 'free-riding' in the literature, is the single most frequently cited problem in the assessment of group work[1,2-4] as it affects the fairness and accuracy of individual marks,[2] creates anxiety about marks[4] and disrupts the development of a positive learning environment in a group.[2,4] Free riders are described as: "individuals who consume more than their fair share of resources without taking on the costs of production." [4(p452)] Terms such as free-riding[1,4] and freeloading[6] are used in the literature to describe those students who shirk their responsibility by not doing the part of work assigned to them but rely on other group members' work for an equal mark of the group's achievement.[4] In addition to free riding, the 'sucker effect' is described[1] as the phenomenon "where capable students reduce their input into a project when they experience free riding by other. " [1(p567)] The sucker effect is reported to occur when competent students avoid being 'suckers' when they observe that others in the group are free riding.

However, an important distinction is made between students who deliberately choose not to participate equally and those students who contribute less owing to social factors such as cultural constraints. This occurrence is described in the literature as 'social loafing'.[1] For instance, in an ethnically diverse group, some group members may be reluctant to contribute for fear of ridicule or feelings of inferiority[1,4] particularly in the presence of powerful students from the dominant ethnic group. Social loafing occurs when students think that their contributions are not valued or that they are not noticed.[1]

Peer management of non-contributors

The management of non-contributing individuals is mentioned as a strategy of enhancing fairness and ensuring that groups have mechanisms to manage students who do not contribute sufficiently.[1,2,4] One strategy described is a method of staged intervention where a free rider receives a warning from their group members and a request to change their participation levels. If the student does not heed the request, the student is reported to the lecturer. After intervention by the lecturer, if the student's participation in their share of the group work is still problematic, the lecturer may exclude the student from the group and request either an individual submission or an oral examination on the work covered by the group.[4]

Conclusion

From the literature reviewed the following salient points emerged:

- Group work is viewed as a valuable learning method;
- Problems in the assessment of group work centre around the identification of individual contributions to enable fair allocation of marks;
- To enhance fairness, separate marks are allocated to group product and process.
- Peer evaluation is used to assess individuals' contributions and their group process skills;
- Peer evaluation is used as a method to manage equal participation.
- For successful peer evaluation, it is vital that group members understand and agree on the assessment criteria.
- Groups should be trained to distinguish between non-contributors who shirk responsibility and students who are quiet owing to social reasons.
- As universities allocate credits to students' individual achievement, the weighting of group work marks to overall year marks should be determined. The University of Victoria, for instance, suggests that group work marks should not contribute more than 30% towards the student's overall year mark.[6]

Viki van Rensburg
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References:

1. Davies WM. Group work as a form of assessment: common problems and recommended solutions. *Higher Education* 2009; 58:563–584
DOI 10.1007/s10734-009-9216-y

2. Fellenz MR. Toward fairness in assessing student groupwork: A protocol for peer evaluation of individual contributions. *Journal of Management Education* 2006; 30(4):570
DOI: 10.1177/1052562906286713

3. Lopez-Real F, Chan TR. Peer Assessment of a Group Project in a Primary Mathematics Education Course. *Assessment & Evaluation in Higher Education* 1999; 24(1): 67-79.
htpp://dx.doi.org/10.1080/0260293990240160

4. Maiden B, Perry B. Dealing with free-riders in assessed group work: results from a study at a UK university. *Assessment & Evaluation in Higher Education* 2011; 36(4): 451–464.
DOI: 10.1080/02602930903429302

5. Lejk M, Wyvill M. Group learning and group assessment on undergraduate computing courses in higher education in the UK: Results of a survey. *Assessment & Evaluation in Higher Education* 1997; 22(1): 81-92.

6. University Teaching Development Centre. Victoria University of Wellington. Group work and group assessment. UTDC Guidelines. [updated and cited 2012, 9 May]. Available from: http://www.utdc.vuw.ac.nz/resources/guidelines/groupwork.pdf

7. Falchikov N, Goldfinch J. Student peer assessment in higher education: A Meta-analysis comparing peer and teacher marks. *Review of Educational Research* 2000; 7: 287-322

Appendix 1: Abstracts of articles reviewed

1. Davies WM. Group work as a form of assessment: common problems and recommended solutions. *Higher Education* 2009; 58:563–584
DOI 10.1007/s10734-009-9216-y

Abstract: This paper reviews some of the literature on the use of group work as a form of assessment in tertiary institutions. It outlines the considerable advantages of group work but also its systemic associated problems. In discussing the problems, the paper considers issues such as ''free riding'' and the ''sucker effect'', issues associated with ethnic mix in groups, and the social dilemma problem—in which students face conflicting demands between altruism and self-interest. The paper then outlines several models of effective group work and makes suggestions for implementing group work tasks. The paper also looks at the key assessment tasks which are commonly employed—namely, additive, conjunctive, disjunctive and discretionary tasks—and assesses which are most suited to group work. The paper considers the related issues of task complexity, recognition for effort, and strategies for minimising issues concerning group size. The paper also briefly considers strategies for implementing incentives for group work members, and outlines the issue of penalties for unproductive group members. The paper concludes by providing recommendations for how to maximise the advantages of group work while trying to minimise the disadvantages.

2. Fellenz MR. Toward fairness in assessing student groupwork: A protocol for peer evaluation of individual contributions. *Journal of Management Education* 2006; 30(4):570. DOI: 10.1177/1052562906286713

Abstract: A key challenge for management instructors using graded group work with students is to find ways to maximize student learning from group projects while ensuring fair and accurate assessment methods. This article presents the Group work Peer-Evaluation Protocol (GPEP) that enables the assessment of individual contributions to graded student group work. The GPEP is designed to achieve the three objectives of providing accurate and fair assessment, supporting student learning, and enabling group self-management. This article discusses instructor experiences with and student reactions to the protocol, opportunities for customization, and potential limitations of the protocol.

3. Lopez-Real F, Chan TR. Peer Assessment of a Group Project in a Primary Mathematics Education Course. *Assessment & Evaluation in Higher Education* 1999; 24(1): 67-79
Htpp://dx.doi.org/10.1080/0260293990240160

Abstract: This paper discusses the problem of discriminating between individual contributions in the assessment of group projects. It is argued that peer assessment is a necessary element of any proposed structure but that the use of any `weighting-factor' system is contrary to the philosophy underpinning collaborative group work. A structure that separates the process and product elements of the assessment is described and a set of generic criteria for the process peer assessment identified. This structure was implemented with a group of students at Hong Kong University and evaluated using questionnaires and in-depth interviews. The paper discusses the results of this evaluation and in particular identifies the need for `benchmarking'

when using the criteria and also the problematic nature of the `insider-outsider' syndrome as an important cultural factor.

4. Maiden B, Perry B. Dealing with free-riders in assessed group work: results from a study at a UK university. *Assessment & Evaluation in Higher Education* 2011; 36(4): 451–464. DOI: 10.1080/02602930903429302

Abstract: Potential employers require graduates to be able to demonstrate competent teamwork skills in initiating ideas and solving problems cooperatively. Teamwork is prevalent in educational institutions and often included as a way of enriching learning and assessment. Whilst group working can provide a rich opportunity for cooperative learning, its assessment can be the cause of much anxiety amongst students. This paper examines the phenomenon of 'free-riding' and explores methods of managing potential abuse. Six approaches were trialled in a UK university business school on modules of study involving assessed group work and the views of students and tutors analysed. Findings from the study indicate that students (like academics) value teamwork even when it is assessed. Any method to moderate 'free-riding' is appreciated by students.

5. Lejk M, Wyvill M. Group learning and group assessment on undergraduate computing courses in higher education in the UK: Results of a survey. *Assessment & Evaluation in Higher Education* 1997; 22(1): 81-92.

Abstract: A survey was undertaken of all universities in the UK to establish the extent and nature of group learning and group assessment on undergraduate computing courses. Quantitative and qualitative data were collected about the amount and control of group learning and assessment, methods of marking group assessments and tutors' attitudes to group learning and assessment. The results are presented, analysed and discussed. The survey shows that group learning and group assessment have established themselves to varying extents in the vast majority of computing courses for which responses were received and points to the need for more research into methods of group assessment which can demonstrate reliability.

Appendix 2: Sample peer evaluation questions

1. **Penn State University**

https://courses.worldcampus.psu.edu/public/faculty/PeerEvalForm.html

- Participated in group discussions or meetings
- Helped keep the group focused on the task
- Contributed useful ideas
- Quality of work done
- Quantity of work done

Scale: 5-point scale: 5 – Superior; 4 –Above Average; 3 – Average; 2 – below average; 1 – weak.

2. **Lopez-Real and Chan[3]**

- Initiative
    - Generating ideas for the activities and methods of solution
    - Finding ideas from other sources
- Commitment
    - Doing a fair share of the work
    - Meeting the deadlines,
    - Attending meetings
    - Being punctual
- Conducive behaviour
    - Allowing other members to have chance to contribute
    - Responding constructively to each other's contribution

Scale: 4-point scale: high; medium; low; zero.

3. **University of Kentucky**

www.uky.edu/SocialWork/crp/files/Samplepeerevaluationform.pdf

- Was dependable in attending group meetings.
- Willingly accepted assigned tasks.
- Contributed positively to group discussions.
- Completed work on time or made alternative arrangements.
- Helped others with their work when needed.
- Did work accurately and completely.
- Contributed a fair share to weekly papers.
- Worked well with other group members.
- Overall was a valuable member of the team

Scale: 5-point scale: 1-Strongly Agree; 2-Agree; 3-Neutral; 4-Disagree; 5-Strongly Disagree.