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An Exploration of Fairness in the Assessment and Process of Student Group Work

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An exploration of Fairness in the Assessment Process of Student Group Work

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Introduction

This project was born from the realisation that despite our collective teaching experience, we were unaware of the options available to us when setting group work assignments for students, particularly in relation to the assessment of the assignments. The topic selection for this project was driven by a motivation to be as fair as possible in the assessment of student group work. All team members teach modules with group work elements, and acknowledge that discrepancies often exist between a mark assigned to a group and an individual's contribution. In our project we would like to:

(i) collectively enhance our understanding of the issues that need to be considered when assessing a group work project and;

(ii) collectively build our confidence in the approaches chosen to overcome these challenges. In particular, we would like to identify strategies to facilitate any student learning from the group work process in a meaningful way that can better their contribution to future group work projects. It is believed that a resistance to the idea of group work from students could be overcome by implementing best practice to ensure a perception of fairness in how project marks are going to be assigned.

The purpose of this project was to create an artefact which can be applied to a module or programme. We started this process by undertaking a literature review on group work assessment. The findings of this review informed the creation of a methodology to develop a <u>toolkit</u> which can be referred to when planning and setting group work assignments. An intermediary stage of this process was the development of an <u>algorithm</u> which incorporated user perspectives to assign associated values to assignment outputs and how they are assessed. This subjective user input, whether it is generated within a School, a subject matter or from a large sample of educators, can then be applied by associated users. An intended output of these potential processes is that the tailored toolkit can assist educators and/or programmes in reflecting on their own teaching philosophy and aligning the group assessment with this. A physical artefact (see Appendix I) was developed as a prototype of how the toolkit information can be visualised.

Literature Review

Key words in our literature search strategy included Group Work, Group Assessment, Group Work Assessment, Group Learning, Peer Assessment, Undergraduate Group Projects, Group Work Assessment; Qualitative & Quantitative, Assessment Techniques, Group Project Evaluation Methods, Fairness Group Projects. The literature consulted included textbooks,

conference papers and journal articles on the topics of group work and assessment, both from practitioner and research perspectives.

Group work and assessment of group work

> Group work has the potential to measurably improve student engagement, performance, marks and retention and usually succeeds in achieving this potential provided that there are associated assessment mechanisms that leverage appropriate student behaviour. In the absence of such assessment mechanisms these benefits may well not materialise. (Gibbs, 2009, p.1)

Group work is now considered to be an integral part of higher education, offering a means to engage students in deeper learning through a collaborative working process. Group work also offers students the opportunity to learn through, and from, a scenario that more closely mimics the real world setting of their potential future workplace. In this sense it also links to graduate attributes and authentic learning. Other advantages of using group work as a form of teaching and assessment described in the literature include that it promotes 'active' rather than 'passive' learning, that it is an 'authentic' form of assessment and that it promotes the construction of knowledge through problem based learning (Martin Davies, 2009). The key challenge with group work is in the selection of the appropriate assessment method to ensure that a 'fair' outcome is achieved for both the group and the individual students.

The different group-based assessment methods and their associated advantages and disadvantages are referenced throughout the literature and surveyed in Falchikov, (2005), Conway *et al.* (1993) and Leijk *et al.* (1996); the most common of these are presented in Table 1. The challenge of achieving fairness in assessment of group work is highlighted as a common theme by Gibbs (2009) and Falchikov (2005).

In selecting an appropriate assessment method for group work, the purpose and overall goal of the project must be carefully considered (Nordberg, 2009; McGarr & Clifford, 2013) and be constructively aligned with the desired learning outcomes of the project (Biggs, 1999). It should be clearly determined whether the process or product of the group work, or both, are to be assessed (Falchikov, 2005). Whether the assessment is to be formative or summative should also be considered; for instance Gibbs recommends 'separating formative assessment of group work from subsequent summative assessment of individuals'. (Gibbs, 2009, p.2) These considerations are all influenced by the teaching and learning philosophy of the lecturer. Given that it has been shown in the literature that 'fairness' can be achieved through the use of any of the assessment methods studied, it is likely that that the teaching approach and philosophy of the lecturer will be the key determinant in the final design of the group work assessment.

Assessment Method	Assessment Process	Literature References
1) Multiplication of the group mark by an individual weighting factor	• Individual weighting factor = individual effort rating (by peers) / average effort rating • Individual contributions were then calculated by multiplying the group mark by the individual weighting factor.	Goldfinch & Raeside (1990) Conway *et al.* (1993) Freeman & McKenzie (2001) Maiden & Perry (2011)
2) Distribution of a pool of marks	•Total marks = Group marks x no of group members • Individual marks, M1+M2+M3.......= total marks • The values M1 etc can be arrived at by consensus or individually. If the latter then an average is taken.	Gibbs *et al.* (1986) Conway *et al.* (1993) suggested that this introduces an element of competition into what had previously been a collaborative effort.
3) Group mark +/- contribution mark	• Deduction or addition of points based on marked criteria.	Gibbs *et al* (1986) Conway *et al* (1993) concerned about high effort marks being given for poor project which could skew results.
4) Separation of process and product	• Methods to measure individual contribution to a group project focussing on the process such as by Keaten & Richardson (1993) • Peer Assessment Inventory PAI which measures attendance, participation, interest in project etc	Keaten & Richardson (1993) Falchikov (2005)
5) Equally shared mark with exceptional tutor intervention.	Widespread approach, with tutor intervening only for exceptional circumstances.	Falchikov (2005)
6) Splitting group tasks and individual tasks.	• Tutor marks individual tasks and group output. • Moderated marks may be arrived at through Peer Assessment process.	
7) Yellow or Red Card system	• All team members receive the same mark. However at any time a group member may be given a red or yellow card. The yellow card is a warning and could result in a 20% reduction in marks. The red card excludes the student and results in a 0.	Leijk *et al.* (1999) Maiden & Perry (2011)
8) Deviation from the norm	• Individual mark = GM + GM(A-N)/100 where GM = group mark A= allocated % contribution N= normal contribution i.e. 25% for a group of 4	Leijk *et al.* (1999)

Table 1: Differentiation between individual and group contributions to a project methods described by Leijk et al. (1996), Falchikov (2005) and Gibbs (2009)

Overall Assessment Goals

"Assessment in practice has two functions: to tell us whether or not the learning has been successful, and in conveying to students what we want them to learn" (Biggs, 1999, p.68). From the students' perspective the method of assessment is the clearest indicator of the true learning objectives of a project. Learning objectives should determine what is being taught, the teaching methods applied and the assessment of learning success - a constructively aligned system of instruction (Biggs, 1999; Martin Davies, 2009). Questions of fairness are more likely to emerge in a context where the learning objectives, group working processes and assessment methods are misaligned.

Nordberg (2009) describes three dimensions of group assessment which should be considered. These are the sources of the assessment, the target of the assessment and the purpose of the assessment. It should be determined whose responsibility it is to undertake assessment and whether the target is the process of group working or the product of group effort. Whether or not the assessment is intended to be formative or summative should be considered.

Webb (1995, p.200, in Falchikov, 2005) "observed that differing purposes or assessment in the context of groups, sometimes represent competing goals. For example, improving individual achievement may not be consonant with the desire to increase group productivity." Learning behaviour that determines high quality project outcomes (product) is not always conducive to improving group working skills. Nordberg (2009) noted that student learning can be good even with poor group dynamics. Conversely it is possible that excellent group dynamics may not guarantee a good project output. This is considered important by Orr (2010) who found that students' approaches to group work projects are influenced by the assessment tools employed - how students feel they can trust the validity of assessment methods affects the competitive or collaborative nature of how they work together. Orr's paper recommends assessing process as a way to enhance student's perceptions of fairness because it acknowledges "the different levels and qualities of contribution which individuals can make to their group" (Orr, 2010, p.311).

Tucker & Abbasi (2015) also asserted that an interconnectedness of both process and outcomes was essential, unlikely that one would be successful and the other would not. In contrast, Leijk *et al.* (1999) and Johnston & Miles (2004) question whether it is appropriate to award marks for effort and/or contribution with a concern that a student could achieve higher marks for greater than average effort regardless of quality of the work. Conway *et al.* (1993) however argued that it is possible that "students who make a greater contribution than their fellows to a project which is skimpy or fatally flawed are likely to end up with a better mark than a lesser contributor to an outstanding project" (Conway *et al.*, 1993, p.47).

Falchikov (2005) also discussed group assessment in terms of the purposes they aim to serve. Her argument centred on whether the purpose of assessment in group working is to measure individual student learning, then the assessment should be designed to encourage processes that benefit this kind of learning. If the purpose is to measure group productivity, then students should be informed of which working processes benefit this. In the case of individual assessment which aim to improve individual learning, an emphasis should be placed on individual accountability and demonstration of each student to summarise the

work of the group. Efforts should also be made to explain to students which processes are beneficial for promoting learning. On the other side, group assessments which aim to measure productivity "should include practice in collaborative working and training in soft skills such as communication and negotiation". (Falchikov, 2005, p.210)

Fairness in assessment of group work

Achieving fairness in assessment of group projects is a recurrent theme in the literature. However Nordberg (2009), Tucker & Abbasi (2015), Malden & Perry (2011) and McGarr & Clifford (2013) all noted that it is the perception of fairness rather than the actual fairness of marks distributed that is of most concern to students engaging in group work. The challenge of dealing with poorly engaged students or "free-riders" is also discussed in the context of how to assess the contribution of all group members in a just manner. Webb (1995, in Falchikov, 2005) attributes 'free-riding', and 'social loafing' behaviours to a diffusion of responsibility which can occur in group work scenarios. The 'sucker' effect is also described here which results from 'social loafing' and the consequent attempts by other group members to avoid this. It is noted that these negative behaviours are always detrimental to individual learning but not necessarily to group productivity. (Webb, 1995, in Falchikov, 2005). Maiden & Perry (2011, p 460) describe several assessment methods which were trialled as case studies to counteract these challenges concluding that "the attempt to address free riding is significant rather than the particular method chosen".

McGarr & Clifford (2013) discuss the consequence of the weighting of a mark given for group work in the context of student's perception of fairness of the process. Different peer assessment techniques are proposed in a number of the papers (Conway *et al*., 1993; Nordberg, 2009; McGarr & Clifford, 2013; and Johnston & Miles, 2004) as an appropriate means of measuring an individual's contribution to a group project (see Table 2). This is generally qualified with a proviso that the criteria for assessment must be clear to the student for both peer and lecturer marking. Methods which include a weighting factor for individual contribution were critiqued by Falchikov (2005) who noted that these can be a 'zero sum' game in which gains for one student imply losses for another. Furthermore as weightings can reflect relative achievement, the composition of the group can have a significant impact on marking differences (Falchikov, 2005). Tucker & Abbasi (2015, page number) concluded that the students' perception of whether their "individual contribution" was fairly assessed had the greatest impact on their evaluation of the overall justness of an assessment method.

Design and Development of the Artefact

Creating a method of evaluating the assessment methods: forming an algorithm

As a group, we were struggling to identify a method of evaluating group assessment strategies in a structured way. This was also a motivating factor for the project – reflecting on how we collectively evaluate group assessment methods and choose a method appropriate to the learning objectives. A literature review had presented a wide variety of group assessment methods (summarised in Table 2), and issues associated with them. In order to devise a way to evaluate our own perspectives on the methods, we conducted a formative exercise to see how we perceived different group assessment methods through a

variety of lenses (Brookfield, 1988) rather than a holistic value judgment of their appropriateness.

We surveyed our individual teaching philosophy concepts to understand how best to evaluate group activities by aligning them with criteria. This was undertaken via an online spreadsheet that used a 5 point Likert scale to rate a selection of group assessment methods, described by O'Farrell (2009), and using five criteria inspired by a presentation to the PG Diploma cohort from Gavin Duffy (2016). The spreadsheet allowed each group member to rate the group assessment methods independently, and then automatically synthesized the ratings of the group into mean opinion scores which could be visualised using graphs (see Figure 1). This allowed us to reflect on the relative merits of each group assessment scheme and to compare our own perspectives with the rest of the group. The artefact was created from the group's mean opinion scores to allow the group assessment methods to be summarized, deconstructed and compared in an easy to digest format.

Assessment Methods	Overall assessment goal (Summative / Equal / Formative)			Choice of group assessment items (Process / Equal / Product)			Purpose of assessment (integrated/separate to learning) (Integrated / Equal / Separate)			Purpose of Group (Teamwork / Equal / Learning Group)			Personal Development Purpose (remedial/integrated with curriculum) (Remedial / Equal / Integrated)			Concepts of Learning (Behavioural / Equal / Constructivist)		
1. Award a group mark, but allow for a "yellow card" if all the group members feel a member of the group is not pulling their weight. If the offending member changes his behaviour before a certain date, the card will be rescinded. If not, a 5% penalty in their mark will be imposed. In a worst case scenario, a red card can be awarded where a student has to produce an individual piece of work instead.	1					1	1					1	1			1		
2. Assign individual responsibilities and assess each member on the degree to which they have met their individual contracts.		1		1				1		1					1	1		
3. Allow the group to divide the group mark depending on individual contributions. Thus, if the lecturer decides that the group project has received a total mark of 120, the group members decide how to allocate the figure. In practice, this is often challenging to execute, as group members have to reach agreement and be very clear in justifying their marks against the assessment criteria.	1				1		1			1				1		1		
4. Peer-assess contributions. Instead of giving the group all the marks to allocate, only a certain percentage is allotted to this process. Thus the lecturer may allocate 80% of the project mark to the group her/himself, and the group may divide the remaining 20% among its individual members as they see fit.	1			1			1			1				1		1		
5. Conduct a viva. A common group mark is awarded, and the remaining marks allotted by the lecturer after a group or individual viva, which should be able to throw insight on individual contributions.		1				1			1			1	1					1
6. Set a project exam. Again, a common mark is awarded to the group, but the module exam will have a compulsory question related to the project which individual students must answer.	1					1	1					1	1					1

Figure 1. Screenshot of the spreadsheet input tab used to align group activities with appropriate assessment strategies

Creating a Useful Resource

Using the algorithm, we took our own group as a sample to test this evaluation methodology towards the creation of a useful tool for educators. A key theme identified in the literature review in relation to perceived fairness of group assessment methods was that the particular assessment method used had little effect on whether or not students perceived the grading to be fair. The perception of fairness was enhanced by the very fact that the lecturer made a transparent effort to be fair in the assessment of group projects, and that a considered approach to choosing the most appropriate assessment method in relation to the learning objectives and learning philosophies was evident to the student. The algorithm created would ideally be used within a specific School or discipline where teaching and learning philosophies would be aligned among lecturers (creating an appropriate 'learning milieu' as mentioned by Gibbs 2009); however, using our own group as an experiment for this research project proved a useful way to test the applicability of the

evaluative data generated by the algorithm. Using the evaluation results, we created two sets of flashcards which we see being a useful tool to help lecturers in the process of curriculum and assessment design in relation to group projects (see Figure 2). The cards can be used from the perspective of 'Assessment Methods' or 'Assessment Criteria' and these two sets are clearly distinguished from each other so they can be used in tandem and also separately. The 'Assessment Methods' set rate each method against the six key criteria: assessment goal, choice of assessment items, purpose of assessment, purpose of group, personal development purpose and concepts of learning. The 'Assessment Criteria' set then evaluate each criterion in relation to the assessment methods. We choose compact A6 sized flashcards which used elements such as colour, icons, concise descriptions of the methods and criteria, along with the data output from the algorithm clearly presented in graphs.

a)

b)

Figure 2: a) An example of the Assessment Methods flashcard. The flashcard rates each assessment method against 6 key criteria. b) An example of the Assessment Criteria flashcard. The flashcard rates each of the 6 key criteria in relation to the assessment method. The complete set of the Assessment Methods and Assessment Criteria flashcards can be seen in Appendix I

Conclusion

Our rationale for embarking upon this project was as a result of our collective experiences using group work as a learning tool. Our previous experiences in our individual teaching practice identified many benefits of group work, including its ability to develop better collaborative working processes amongst students and promote "active" rather than "surface" learning. However, in addition to these positive elements, we also identified several recurring problematic areas, particularly in the area of the assessment of group work and student's perception of "fairness". As "gatekeepers", we were also mindful of the need to reward those students that participated fully in group work processes and to also identify those students that appear less committed.

After consulting the literature, we discovered that these positive and negative themes were consistently reported. Previous studies have identified the potential for group work to measurably improve student engagement and performance. However, several articles have also acknowledged, and attempted to rectify, issues concerning "fairness" in group work assignments and the importance of aligning the objectives with the most appropriate assessment method (Conway *et al.*, 1993; Falchikov, 2005; Gibbs, 2009; Nordberg, 2009; McGarr & Clifford, 2013).

In an attempt to overcome these issues, we decided to construct an algorithm that would identify strategies that would align learning objectives and assessment methods and address issues concerning "fairness". Initially, the algorithm was constructed electronically

using an excel spreadsheet. However for the purpose of our assignment, we decided to adapt the electronic algorithm to a series of "easy to use" flashcards that a lecturer could use to aid their selection of assessment methods for group projects.

One of the limitations of our project is the subjective nature of our evaluation of the assessment methods. This discrepancy was not surprising given the variety of disciplines in which we teach. Ultimately, we feel the evaluation approach we used has significant potential should it be studied further in the context of larger number of lecturers, or within specific Schools or disciplines to develop a best practice framework for designing group assessment. The flash cards created demonstrate that the data can be adopted into a useful tool that will enable academics to plan the assessment of group projects with greater efficiency, and potentially increase the perception of fairness among students who are being assessed *via* group projects.

Future Direction

The artefact, and instructions of how to implement it, could be uploaded to the Arrow repository at DIT. Users could access the tool and use it to help align their learning goals and assessment methods. In addition, users could also offer feedback allowing the tool to evolve or be better adapted to the various disciplines in DIT.
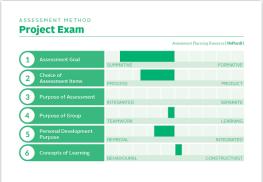
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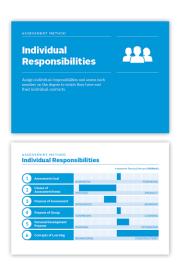
Appendix I

Assessment Methods Flashcards

Visuals of the full set of flashcards with the 'Assessment Methods' set.

Assessment Criteria Flashcards

Visuals of the full set of flashcards with the 'Assessment Criteria' set.