



Equity in Group Work Methodologies

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Collaboration is a necessary graduate attribute and is regarded as an effective way to increase learning and understanding. Technologies in education have vastly extended the opportunity for collaborative approaches to learning due to anywhere/anytime accessibility. However, whether in the virtual environment or in person, barriers to collaborative group work persist.

To determine potential group work barriers, this exploratory study investigates student responses within an online environment that utilises a range of collaboration tools, together facilitating a student peer-reviewed group research project in first year human biology. Pre- and post-activity surveys were conducted and revealed persistent perceptions of inequity with regard to group work participation. However, the surveys also indicated that on an individual level there was broad agreement of benefits gained throughout the collaborative process.

The results indicate that a major barrier to student engagement with collaboration relates to perceived performance of others, and not with perceived self-improvements experienced via the collaborative process.

Keywords: Equity, collaboration, group work, peer assessment, large classes.

Introduction

Acquiring a range of graduate attributes that contribute towards life-long learning is a hallmark of the assessment era and a crucial point of departure from the testing era as indicated by Birenbaum (1996). Group work and peer assessment as methods for engendering learning provide a pluralistic approach (Dochy *et al.* 1999) that increases student involvement via collaboration, role adoption, and a greater sense of responsibility.

Collaboration is a necessity within the health industry, an effective way to increase learning opportunities, and provides a realisation of individual strengths and weaknesses. This study explores students' attitudes within a combined group research and peer assessment activity in order to inform the development of strategies to improve group work experiences within a first year foundation Health Sciences course.

Background

Drivers supporting the adoption of group work and collaboration include enabling technologies, large class strategies, student diversity, and evidence of benefits derived from collaborative learning. The range of collaboration methods that have been applied within the first year Human Biology course associated with this exploratory research are briefly described below:

Peer Assisted Learning Strategies

Peer Assisted Learning Strategies (PALS) is a process where higher level students provide cross-year support to assist lower level students during their learning process (Ricci & Peirce, 2010). The benefits of peer assisted learning are related to the non-threatening interaction between students and their peers in that peers are not involved in assessment, may be perceived on a similar level to the students, and provide a cooperative approach to understanding course content. Other notable and similar methodologies are PASS (Peer Assisted Study Sessions) and PAL (Peer Assisted Learning) (Howman *et al.* 2002).

Team Based Learning

Team based learning is a methodology that promotes student interaction within small groups to encourage more active and effective learning (Michaelsen *et al.* 2004). Implementing team based learning requires appropriate course structure design to enable collaborative learning to occur, and adopts a transformative approach leading to several kinds of higher level learning attributes.

Self & Peer Assessment

Self assessment is reflective in that it enables the student to step back from their learning process and consider the effectiveness of their learning strategy. It encourages student independence by accepting a sense of responsibility for their learning process. Peer assessment extends the benefits of self assessment by allowing students to critique and evaluate the work of others. This deepens the potential for reflection during both the peer evaluation process, and in receiving and responding to evaluation from peers. Peer assessment concerns assessment between students of the same or similar educational status and includes individuals and or groups of students within the same course or subject. Topping (1998) indicates that peer assessment of writing and using marks, grades and test have shown positive formative effects on student achievement and attitudes. Topping also suggests that these effects are on par with or more effective than teacher assessment.

Research Skills Development Based Rubrics

The research skills development framework is a conceptual model that locates research skills on a continuum of student autonomy (Willison *et al* 2009). The model encourages students along a pathway beginning with a

relatively high degree of structure and guidance, to a relatively high degree of open inquiry and autonomy. The research skills development framework has been incorporated into a structured assessment rubric that encourages student research development and assists in the acquisition of skills and motivations necessary to progress to higher degrees by research. Whilst RSD is not in itself an individual or collaborative learning method, it assists in the goals of collaboration to the extent that it encourages student autonomy.

Methodology

The collaboration and assessment strategies described above have been integrated within a semester long group research project in the course of first year Human Biology. Given the range of learning methodologies and technologies applied, exploratory surveys relating to team based learning, self and group reflection were conducted over the study period with the aim of revealing any barriers to creating a successful group work and peer-assessment learning environment.

Students were randomly allocated to groups (n=49, ~5/group) to undertake the semester-long research project based around scientific research, refinement and presentation of a general human biology topic. Task objectives, guidelines and assessment criteria relating to group collaboration, communication and research were provided to students.

The entire project, including its assessment, was undertaken within an online environment utilising learning management system technologies, wiki's, and a purpose-built group peer assessment application. Methods and strategies utilised in the activity included group work information sessions, peer assisted learning – PALS (Ricci and Peirce 2010), RSD rubrics (Willison and O'Regan, 2007; Peirce and Ricci 2007; Willison *et al.* 2009), and rubric guided feedback via peer assessment prior to final project submission. A range of team-based learning, attitude to group work and reflective surveys were conducted prior to and after the group work period with the aim of revealing any major potential barriers to engagement with group work and peer assessment.

Pre-activity

Prior to the group work activity the students (n~160) completed a Team Based Learning survey in order to determine their attitudes towards group work with respect to content covered, equity, motivation, socialisation and effectiveness. After obtaining initial data on attitudes towards group work, the students were then given a brief presentation on organisational behaviour theories that underpin effective group work, including differing learning styles, motivations, communications, and varying stages throughout a collaborative project.

Activity

The students worked together in groups of approximately five members in creation of a human biology research project. The group work activity represented 30% of the total assessment, the remainder consisting of 10% individual assignment, 15% online activities, and 45% final exam.

The students were assessed on their research content, their group work process, and on their ability to peer-evaluate the work of another group. The peer evaluation was conducted using a purpose built online rubric assessment application that required justification to be provided for selected assessment criteria, and an instructor feedback mechanism. Groups were required to respond to peer evaluation and demonstrate how suggestions were implemented or, if not, then why. On project completion the student groups created research project poster presentations, and prizes were awarded for the best group research poster over a number of categories.

Post-activity

During the final poster presentations and research completion ceremony, and for the purpose of comparison, the students were once again given the same Team Based Learning survey as provided prior to commencing the activity. The students were also asked to complete a brief self-reflection survey inquiring as to the perceived benefits of group work for themselves and for others in their group.

Results

The pre-activity team based learning results indicated overwhelmingly that the students regarded that the more able and motivated students would end up doing most of the work within a collaborative environment. It was also regarded that less content would be covered within a collaborative learning context, and that time would be wasted socialising. However, approximately half of the survey participants felt that knowledge of group work theory would lead to more effective group work practice.

Table 1: Comparison of Pre and Post Activity Results

Group work means that:	less content will be covered	better students do most of the work	less motivated students will "free-ride"	time is wasted socialising	results are ineffective with no group theory.
Pre-Task Survey (n=160)	6.6	7.8	7.6	6.0	5.0
Post-Task Survey (n=160)	6.9	7.7	7.2	5.3	4.9

Comparison of the pre- and post-activity team based learning surveys indicates that students' attitudes with respect to others within a collaborative environment were largely unchanged. There remained broad agreement that the "better" students end up doing most of the work, and less motivated or less capable students "free-ride" on others.

Table 2: Group Work Self-Reflection Survey

Student self-assessment of performance survey (n=181)	T	F	n/a
I am more aware of the skills required for working effectively in a group	95.6	4.4	0
I am more aware of my strengths and weaknesses in interacting with others	85.6	14.4	0
Overall, the group work activity was a positive experience for me	77.3	22.7	0

In the self-evaluation survey, however, students reported a favourable disposition towards group work. Greater than 95% of students reported an increased awareness of the skills required for working effectively as part of a team, 85% were more aware of their individual strengths and weaknesses, and 77% communicated that their group work experience was positive.

Discussion

The pre- and post-activity team based learning surveys relate to a perceived sense of equity with regard to the performance of other students within the group. However, the self-reflective survey relates to the perception of one's own measure of their contribution. A major discrepancy was found between the others-oriented evaluations and the self-oriented evaluations of group work contributions over the collaboration period. While the others-oriented evaluations remained largely unchanged over the period, on individual reflection there was

broad agreement that each group member themselves had achieved improvements on a number of group work related dimensions.

Collaboration is shown to be of benefit to student learning and engagement, yet group work continues to be met with either reluctance or resistance from many students. While students overwhelmingly perceive improvements within themselves via the process of collaboration, it appears that they also conversely perceive that their relation to other group members does not improve. Therefore, a major barrier to group work resides not in how the students feel about their own capacity for achievement within this environment, but in how they perceive the achievement of others.

Given the known benefits of collaboration and in order to remove perceptual barriers towards group work, it is recommended that a focus on what others can achieve be communicated, rather than reiterating what the individual can achieve within a group work environment. Communications of this nature will address the current others-oriented barrier with regard to group work acceptance, and also address misperceptions in regard to the wider benefits of a collaborative environment. Put another way, a communication of others-oriented benefits is likely to assist in supporting the collaborative environment by shifting the focus from a “what you can gain from group work” perspective to a “what group members can gain from group work” perspective.

Conclusion and future work

Exploratory research within a technology-enabled group work peer learning environment has been conducted with the aim of revealing potential barriers to group work acceptance. Preliminary results indicate a major discrepancy in the perceived benefits of group work depending upon whether an others-oriented or a self-oriented viewpoint is reported.

The self-oriented reports were found to be congruent with existing literature in that group work is regarded as beneficial in areas of skill building and effectiveness, whereas the others-oriented reports were found to contradict benefits described in existing group work literature. We can conclude that others-oriented perceptions with regard to group work creates a major barrier to group work acceptance, and that this perception is at odds with the known benefits.

Based upon the preliminary findings, it is suggested that barriers to group work may be effectively addressed via communication of others-oriented benefits, rather than via appeals to self-oriented benefits. Further investigations into effective group management and communications may assist in resolving perceived equity issues and in reducing barriers to group work. A reduction in the barriers to group work acceptance will allow for a greater number of collaborative benefits to be realised.

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