An investigation of undergraduate students' feelings and attitudes towards group work and group assessment

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Abstract: *Group-based or co-operative learning can benefit individual student learning, however, recent verbal feedback from students at Sydney University about group work was disappointingly negative. This feedback prompted the present study, which set out to determine the attitudes of students to group work and group assessment. Students in Pharmacology (n = 46) and IT (n = 80) were evaluated at the beginning and end of semester two (2003) using the following questionnaires: Feelings Towards Group Work (FTGW; Cantwell and Andrews, 2002) and either, Attitudes Towards Peer Evaluation (ATPE) or Attitudes Towards Group Work Assessment (ATGA). These latter two questionnaires were developed for this study. The two disciplines were chosen as their group work was assessed differently and it was of interest to determine whether the differing methods of assessment affected students' attitudes. At the start of semester all students indicated a neutral to slightly negative attitude towards individual work but a favourable attitude towards group work. A significant but small change in favour of group work was found for Pharmacology students whereas we found no change in attitude for the IT students. Interestingly, we found no particular preference for group assessment that used peer evaluation to obtain individual marks to one that was based on a shared group mark. In conclusion, despite concerns expressed in a recent University of Sydney Academic Board Review about group work and its assessment, this study reinforces the findings of previous research into group work suggesting that the experience is generally positive for students.*

Keywords: *group work, student perceptions, group assessment*

Group work or group learning (also referred to as co-operative, collaborative or peer learning) is widely recognized within the higher education sector as being an effective teaching and learning methodology. Group learning is considered to promote lifelong learning skills (Boud, Cohen, & Sampson, 1999) and has been shown to enhance student performance (Sorbral, 1997, Kogut, 1997, Gupta, 2004). A plethora of studies support the positive aspects of group work (Slavin, 1996; Greenan, Humphreys, & McIlveen, 1997; Boud et al., 1999; Barfield, 2003; Gupta, 2004), however, some studies have reported the negative consequences of poor group work (Pitt, 2000; Dryud, 2001). Recent verbal feedback from students at Sydney University about group work was also disappointingly negative (University of Sydney, 2002).

Negativity associated with group work is commonly related to group assessment. Often the method of assessment involves all group members receiving the same mark (Lejk et al 1996). However, this method is frequently cited as being problematic due to "social loafers". To address this problem many educators have adopted the "Knickrehm method" which involves the teacher grading the product whilst group members are asked to evaluate each other on group process (Maranto & Gresham, 1998). One important outcome of this approach is to enable an individual mark to be awarded to each student. This approach has been used widely. In fact, Lejk et al (1996) describe nine different methods for deriving individual marks and there are likely many more.

Whilst there is a general consensus that group work, if planned and managed well, is generally enjoyed and is of benefit to students, few studies have investigated how students actually feel about group work *per se* and none, as far as we can determine, have examined whether differing methods of assessment affect students' attitudes towards group work. Barfield (2003) recently explored the effects of prior group grade experience, maturity and part-time work commitments on university students' satisfaction with group grades and determined that each of these variables tended to increase dissatisfaction with group grades highlighting some of the variables that need to be considered when considering group assessment. Perhaps the most pertinent study in this area, however, is that by Cantwell and Andrews (2002) in which they explored the cognitive and psychological factors that underlie secondary school students' feelings towards group work. Their findings indicated that cognitive factors such as metacognitive awareness related to a preference for group work whereas psychological factors such as social anxiety related to a preference for individual learning.

The use of group-based learning is based on the assumptions that students are comfortable with the idea of group learning and that they possess the requisite skills. However, if these assumptions are incorrect then, as Barfield (2003) commented because pedagogically, emotion is an important component of learning, many of the benefits of group work are unlikely to be realized. Thus it is important to have an understanding of how students feel towards group work. In addition, given the importance of assessment for student learning it is important to determine whether differing group assessment procedures have a significant impact on attitudes/feelings towards group work.

Study's aims and hypotheses

The first aim of this study was to formally evaluate students' perception of group work. Specifically, attitudes towards group work of two cohorts of undergraduate students studying either Pharmacology (2nd year) or Information Technology (3rd year; Information Technology) were evaluated using a questionnaire developed by Cantwell and Atwell (2002) Feelings Towards Group Work (FTGW). The second aim of the study was to determine attitudes of these students to group assessment procedures. For Pharmacology, the group assessment procedure included peer evaluation (student assessment of group process) with students receiving an adjusted group product marks according to the group evaluation score. These students were evaluated using the questionnaire Attitudes Towards Peer Evaluation (ATPE). For Information Technology, students received the same mark for a group project and there was no

peer evaluation. These students were evaluated using the questionnaire Attitudes Towards Group Work Assessment (ATGA). Both the questionnaires ATPE and ATGA were developed for this study.

Students were evaluated at the beginning (Time 1) and end (Time 2) of semester. Specific hypotheses tested were:

1. Preference for individual group work would decrease between Time 1 and Time 2
2. Preference for group work would increase between Time 1 and Time 2
3. Discomfort in groups would decrease between Time 1 and Time 2
4. Attitudes towards peer evaluation/group assessment for Pharmacology/Information Technology students would improve between Time 1 and Time 2.

Method

Design

A two-phase repeated measures survey design was conducted. Time 1 required participants to assess students' attitudes towards group work prior to their group work assessment task, and Time 2 took place in the final week of a 13-week semester after the completion of the group work assessment task.

Participants

Participants were selected from two cohorts of science students at the University of Sydney, Australia. In the initial phase (Time 1) 118 Pharmacology students, out of 160 enrolled students, and 119 Information Technology students, out of 136 enrolled students, participated. The number of students who participated in both phases of data collection at Time 1 and 2 totalled 46 from Pharmacology (39 females and 7 males) and 80 from Information Technology (46 females and 34 males).

Group assessment procedures

For Pharmacology, the group assessment procedure included peer evaluation so that an individual mark could be determined based on students' individual contributions. The method used was an adaptation of that used by Bastick (1999). The product (lab report) was assessed by staff using criteria given to students before completion of the group assignment. Performance of each member of the group was evaluated by peers and based on five performance criteria (reliability, preparation and participation, completion of a given task, contribution to group discussion and provision of feedback). The score for each criterion was calculated by multiplying the number in the group less one, by 20. Students were asked to distribute the score for each criterion between group members according to their performance. The average percentage of the total scores was then used to calculate individual marks based on the mark received for the product. This meant that some students received a mark that was higher than the assignment mark, others a lower mark.

For Information Technology, the product was assessed by staff using criteria given to students before completion of the group assignment and there was no peer evaluation. All students in a group received the same mark.

Measures

a) Feelings Towards Group Work (FTGW) questionnaire was developed by Cantwell & Andrews (2002). The original questionnaire consists of 30-item Likert scale where 1 = *not at all true of me* to 5 = *very true of me*. The scale contains three main factors: - i) preference for individual group work (I) with a Cronbach's alpha = .78; ii) preference of group learning (G) with a Cronbach's alpha = .71; and iii)

feeling of discomfort in groups (D) with a Cronbach's alpha = .60. It should be noted that the 30-item FTGW was not sufficiently reliable for the present sample, and the reliability analyses resulted in the deletion of some of the original items from each of the three subscales in order to achieve acceptable levels of reliability for the current study - Cronbach's alpha for the (I) subscale = .82; (G) subscale = .50; (D) subscale = .64.

b) Attitudes Towards Peer Evaluation (ATPE) *and* Attitudes Towards Group Work Assessment (ATGA) *were developed by White, Lloyd, Stewart and Kennedy (2004) for the current study. The ATPE scale was developed to measure students' perceptions of the peer assessment process. The ATGA scale was developed to measure students' perceptions of the group assessment process. These newly developed 10-item Likert (where 1 = Not true of you at all; 5 = Very true of you) ATPE and ATGA scales showed high internal reliability – Cronbach's alpha ranged from .83 to .88 for the ATPE; and from .70 to .87 for the ATGA. Refer to Appendix for full versions of these scales.*

Procedure

At Time 1 Pharmacology students were administered the FTGW and ATPE in their classroom; whilst the Information Technology students were administered the FTGW and ATGA in their respective classroom Thirteen weeks later after each student cohort had completed their group work task the same set of questionnaires were administered to them at Time 2. In each phase questionnaire administration was counterbalanced to guard against order effects. All participants were given approximately 40 minutes to complete the questionnaires.

Results

Changes in students' attitudes between Time1 and 2

In order to test the study's hypotheses, a dependent samples t-test was conducted on the mean scores for the FTGW, ATPE and ATGA scales between Time1 and 2. Alpha was set .05 and assumptions of normality were met. The findings reported in Table 1 suggest that the mean preference for individual work decreased significantly for the Pharmacology sample [$t(41) = 2.81$, $p < .05$] but not for the Information Technology sample [$t(73) = 1.9$, $p = .062$]; the mean preference for group work increased significantly for the Pharmacology sample [$t(42) = 2.60$, $p < .05$] but not for the Information Technology sample [$t(76) = 1.0$, $p = .92$]; and the mean reported discomfort in groups decreased significantly for the Pharmacology sample [$t(44) = 2.25$, $p < .05$] but not for the Information Technology sample [$t(76) = 1.94$, $p = .056$].

Overall, hypotheses 1, 2 and 3 were confirmed for the Pharmacology sample only. Significant but small change in attitudes towards group work with the Pharmacology students was found. The students' responses were more favourable in Time2 than in Time1 — a small improvement, but a positive result. Their attitudes towards peer evaluation did not change over time, remaining neutral from Time1 to Time2. Information Technology students, however, showed no significant changes in attitudes between Time1 and Time2.

Note: Each item in a subscale is a 5-point Likert scale item, so a 'negative' response is 1 or 2, neutral is 3, and 'positive' is 4 or 5. So, for example, the neutral mid-point of the Individual and Group Work Preference subscales (seven items) is a score of 21, the midpoint for the Discomfort in Group subscale (four items) is 12, and the mid-point of the ATPE and ATGA scales are 30.

Looking at the survey responses broadly, as summarised in Table 1, students' preferences for individual work were neutral to slightly negative, whereas students reported a favourable attitude towards group

work. For both Pharmacology and Information Technology students in this study, the means for the Preference for Individual Work scale were lower than the means for the Preference for Group Work scale.

	Time 1		Time 2	
	M	**SD**	**M**	**SD**
Pharmacology (n=46)				
Individual Work Preference	20.43	*5.8*	18.63	*5.6*
Group Work Preference	26.33	*2.8*	26.50	*3.1*
Discomfort in Group	9.20	*2.7*	8.20	*2.8*
ATPE	29.92	*6.6*	30.92	*7.8*
Information Technology (n=80)				
Individual Work Preference	18.53	*4.5*	19.72	*5.4*
Group Work Preference	27.21	*3.5*	27.23	*3.3*
Discomfort in Group	8.79	*3.0*	8.43	*2.7*
ATGA	30.20	*4.7*	30.03	*7.1*

Table 1. Means and Standard Deviations for the FTGW, ATPE and ATGA scales for matched samples of Pharmacology and Information Technology students at Time 1 and 2

This study examined two different models of assessment— peer evaluation and group assessment. Table 1 reveals that there were no significant difference found between Time1 and 2 for scores on the ATPE or ATGA for either sample, thus hypothesis 4 is not supported. Moreover, the students' attitudes towards the different group work models are neutral; neither model stands out as particularly positive or negative for the students.

Table 1 also reveals that there were significant but small differences found between Pharmacology students' and Information Technology students' responses at Time1, for the Preference for Individual Work (p = .003) and Preference for Group Work scales (p = .012). In that trial, Pharmacology students were slightly more favourable towards individual work and slightly less favourable towards group work, than the Information Technology students. However, given the different prior experiences of the two groups, this result is difficult to interpret.

Discussion

The students surveyed in this study were found to have a greater preference for group work than individual work. This finding reinforces the results of previous research suggesting that group work is generally a positive experience for students (Gatfield, 1999; Barfield, 2003; Mills, 2003; Gupta 2004). Interestingly, despite feelings towards group work being positive, attitudes towards group work assessment were neutral. This neutral attitude may explain why the assessment procedure appeared to have little impact on students' perceptions of group work (cf. Pharmacology with Information Technology students). The observation that there was little difference in attitude between group assessment that used peer evaluation to obtain individual marks to one that was based on a shared group mark (between groups comparison) seems at variance with the general acceptance of the value of peer evaluation in

enhancing group work (Lejk et al., 1996; Lejk & Wyvill, 2001). Nevertheless, using a within groups comparison design, students' attitudes towards group work in Pharmacology did improve slightly over the course of the study but whether this is due to the inclusion of peer evaluation in the assessment procedure is not known.

Whilst peer evaluation has been adopted as a means of reducing "social loafers" and improving the fairness of group assessment, little attention has been given to other factors that may improve students' feelings towards group work. The finding by Cantwell and Andrews (2002) that students who expressed a preference for individual work also reported higher levels of social anxiety, clearly needs to be factored in when managing group work projects. A relatively recent article by Schullery and Gibson (2001) reported that students identified a range of issues that hampered group work including public speaking anxiety, conflict avoidance, brainstorming and motivation. These authors then created a series of successful pedagogical exercises to address these issues.

In addition to considering psychological factors and skills required for group work, overall planning and management of group work is important for successful implementation. In the present study, we adhered to the guidelines for group work which have been published by the Centre for the Study of Higher Education (CSHE) in Melbourne and the Australian Universities Teaching Committee (AUTC), These guidelines, which have been prepared expressly for Australian Universities, are based on five important issues related to the effectiveness and management of group work. Issues that need consideration are:

1. *Determining group membership* — Options include allowing students to choose or assigning students to groups.

2. *Establishing the roles of individual members* — This is to ensure that students have a clear idea of what is expected of them.

3. *Helping students manage their group responsibilities* — It may be necessary for staff to help students with practical aspects required for group work such as scheduling meetings or forming networks.

4. *Explaining the purpose of group work* — Staff need to make explicit to students how the group activities help their learning

5. *Deciding on the method of assessment* — Four factors were identified as needing to be considered:

    - what to assess (process, product or both)
    - what criteria to use
    - who will do the assessment (staff, student or both)
    - how will the marks be distributed (e.g. shared group mark, group average etc)

In conclusion, this study indicated that group work was preferred above individual work irrespective of the method of assessment. These results are encouraging. Our finding that students preferred group work, however, is tempered by the fact that this preference was not overwhelming. Further improvement in assessment procedures and provision of specific group-skills instruction may further increase students' enjoyment of and benefit from group work.

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Appendix

Attitudes Towards Peer Evaluation (ATPE)

1. I think that overall the process of peer evaluation used assessed everyone's individual contribution fairly.
2. I believe that the process of peer evaluation used sometimes discriminated against some individuals in the group.
3. I found the criteria (ie., reliability, preparation, achievement, contribution and useful feedback) for peer evaluation were made clear and explicit.
4. I would like any future group work to adopt a similar process of peer evaluation.
5. I believe the peer evaluation process helped me develop skills in independent judgement.
6. I would like to see the peer evaluation process remain the same as that used.
7. I think the peer evaluation process accurately assessed my individual level of performance on the criteria provided.
8. I found the criteria for peer evaluation, as given, were difficult to follow.
9. The process of peer evaluation process accurately assessed other group member's individual level of performance on the criteria provided.
10. I would like to see the process of peer evaluation improved.

Attitudes Towards Group Work Assessment (ATGA)

1. I think that overall the process of evaluating group work used assessed everyone's individual contribution fairly.
2. I believe that the process of evaluating group work used sometimes discriminated against some individuals in the group.
3. I found that the criteria for the evaluation of group work were made clear and explicit.
4. I would like any future group work to adopt a similar process for the evaluation of group work.
5. I believe the process of evaluating group work helped me develop with skills in independent judgement.
6. I would like to see the process of evaluating group work remain the same as that used.
7. I think the process of evaluating group work accurately assessed my individual level of performance on the criteria provided.
8. I found that the criteria for the evaluation of group work, as provided, were difficult to follow.
9. The process of evaluating group work accurately assessed other group member's individual level of performance on the criteria provided.
10. I would like to see the process of evaluating group work improved.