Engaging and informing students through group work

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The aim of this action research was to explore the benefits of group work as a tool for engaging students with introductory material. It was the researcher's expectation that group work, would provide a means of reducing cognitive load (Kirschner, Sweller & Clark, 2006) and encouraging on task behaviour (Wentzel & Watkins, 2002). This would result in a positive impact on students engagement with, and understanding, of introductory material necessary for progressing on to more complex issues covered at Level 5 of a psychology course. The implication of these research findings on future group work and other aspects of teaching practice are discussed.
Keywords: *group work; cognitive load; friendship; action research.*

THIS ACTION RESEARCH was born out of observations of student's disengagement within formal lectures for Individual Differences. Mid-module reviews suggested that students were feeling overwhelmed by the large quantity of information being received in lectures. They gave comments like 'There's too much to take in.' Furthermore, peer observations revealed that when the tutor attempted to engage students with tasks during lecture time, these students appeared unenthusiastic. It was decided that in order to improve this situation, the traditional lecture mode of introducing information would be replaced with a group project in an attempt to engage students while maintaining the level of understanding of the topic achieved through tutor presentation.

The aim of this action research was to identify the necessary elements for the success of group work in improving knowledge of and engagement with the topic, relative to tutor presentation of information.

Prompting active deep learning

By definition active learning requires students to become engaged in the learning task, this approach is said to surpass traditional lectures for retention of material and motivating students to study (Prince, 2004). Although a number of tasks were presented during traditional lectures in an attempt to engage students, Prince (2004) suggests that introducing an activity in a lecture may fail to encourage active learning as it must allow for deep meaningful considerations of the material. Current tasks in which students became involved during lectures are more likely to be short surface level tasks due to the time constraints on sessions.

Deep learning focuses on understanding the meaning around the topic as opposed to surface learning which is related to rote learning in which a student can repeat information presented to them but not necessarily apply this information in a meaningful manner. Mellanby, Cortina-Borja and Stein (2009) characterise deeper learners as:

> *'students who have the most enthusiasm and motivation for their subject, who like to think logically, and are interested in how its characteristics fit together, who can relate these to other knowledge, and predict new features from what they already know.'*
> (Mellanby, Cortina-Borja & Stein, 2009, p.598)

By offering an alternative to traditional lectures which focuses on inviting students to explore the meaning of information opposed to merely receiving this information at a sensory level it is expected that the intervention will enhance both engagement (synonymous with active learning) and main-

tain/enhance levels of understanding around the topic (synonymous with deep learning).

Popularity of group work

The majority of Prince's review into active learning focuses on group activities. There is a large body of research that has supported the benefits of group collaboration in students learning (Biggs & Tang, 1999; Nordberg, 2008; Slusser & Erickson, 2006). Indeed the importance of social interaction in learning is a significant part of many theories relating to how we learn, for example, social learning theory, social constructionism, and Vygotsky's and Piaget's developmental theories.

Group work has been introduced into classrooms in a number of formats including; Evidence-based Learning, Problem-based Learning, Snowballing, Buzz Groups, Contingency, Aronson's Jigsaw Method, and the Group Investigation Method to name a few (Edmunds & Brown, 2010; Slavin, 1996). In each case the purpose of the group is to pool information and other resources in order to respond to a given task/scenario which may or may not be assessed. Nevertheless, this huge variation in the way in which group work is administered has resulted in a range of outcomes.

Although there is support for students' positive perceptions of group work in terms of providing an active and supportive learning environment (Florez & McCaslin, 2008), there is also a large body of literature outlining more negative perceptions such as the experience of group work as being disorganisation, suffering from a lack of commitment, and leading to disagreements between group members (Pauli et al., 2008). Furthermore, when positive perceptions are expressed these may not necessarily equate with the achievement of learning outcomes, as illustrated within research conducted by Delucchi (2007).

Individual accountability verses team building

Slavin's (1996) review of the literature on group work identifies a number of requirements for a successful group. This review includes two competing perspectives on group success. Motivational perspectives, which state that by creating a situation in which to reach a personal goal a student must work in a group, and providing group reward based on individual learning of group members, are the most important parts of a group success. Alternatively, the social cohesion perspective states that within a group students will automatically help one another learn as they care about each other. This perspective disregards individual accountability and group reward, and instead the process of the task itself is seen as being enough to motivate students, emphasising the role of team building in order to enhance group cohesion before commencing the task.

A number of other papers have explored the impact of peers as motivators of on-task behaviour. Wentzel and Watkins (2002) take a Vygotskian perspective towards group work. According to these researchers learning is linked to the social context in which people learn. By providing a co-operative learning context (an approach to group work, in which students work together towards a common goal) peer relationships can act as motivators for engagement in academic tasks. Also, these peer relationships can act as enforcers of appropriate behaviours as well as providing a supportive structure in which problem-solving skills can develop. This view of peers as 'academic enablers' suggests that co-operative learning can not only enhance the frequency of socially acceptable behaviours, as 'peers hold each other accountable to certain standards of conduct' (Wentzel & Watkins, 2002, p.369) but peers can also act as motivators for on-task engagement and assist in the development of skills necessary for such co-operative learning as they are rewarded for positive learning behaviours such as listening behaviours.

The idea of group cohesion, previously defined as 'group members inclinations to forge social bonds, resulting in group members sticking together and remaining united' (Carron, 1982, cited in Casey-Campbell & Martens, 2009, p.224), has been suggested to incorporate two dimensions social cohesion/interpersonal cohesion and task cohesion. Task cohesion refers to the need for a task which requires group effort and thus increasing the need for the group to work together. Casey-Campbell and Martens' review provides support for task cohesion having the strongest association with performance, as this dimension resembles that of motivational perspectives outlined by Slavin, it is suggested that rather than competing the main focuses of both social cohesion and motivational perspectives in Slavin's review may be needed to' increase the success of the group.

Nevertheless, considering these perspectives one criticism of both rewarding students for completion of group work and emphasising social cohesion within groups before commencing group tasks, is that neither of these situations reflects the demands on employees within the work environment, a benefit of group work highlighted by Norberg (2008).

Selecting the group task
One approach to group work which is evidenced to encourage deep learning is problem-based learning (PBL). Azer (2009) refers to this approach to group learning as developing student's cognitive skills, such as the ability to identify problems and develop plans, as well as a means of allowing students to take responsibility for their own learning.

However, one concern regarding implementing this approach is the cognitive load attributed to problem-based searching. There is evidence to suggest that tasks such as PBL, and those that offer minimal guidance, introduce a further cognitive load associated with understanding and navigating through the method of working (Kirschner, Sweller & Clark 2006). Yet there is support

within the literature, around cognitive load, that the use of group work with guidance can increase the cognitive capacity available to students when understanding complex tasks, impacting positively on student's retention of knowledge (Kirschner, Paas & Kirschner, 2009). By using co-operative learning intrinsic load (relating to the number of elements and interactions to learn, the more elements and the more interactions the high the load) can be divided up amongst students, giving them more capacity in which to focus on germane load (relating to the mental effort to process the new information and integrate it with existing knowledge structures). This further supports the benefit of a group activity on reducing what students perceive as a lot of new information.

An alternative group approach to learning which incorporates a common goal to present to the class the group's findings, emphasising the importance of deeper learning, is that of the group investigation. This approach to group work involves dividing a topic amongst small groups who investigate and ultimately present their findings to the rest of the groups. The approach emphasises what are known as the four 'I's. Students get into groups that are interested in the same topic. They then *investigate* their chosen topic, *interact* to explore ideas and help one another learn, following which they *interpret* findings of each member in order to enhance their understanding of ideas and finally *intrinsic* motivation results from the autonomy in the process (Zingaro, 2008).

Support for the benefits of presentations on learning is provided by a number of researchers including Sander, Sanders and Stevenson (2002). Presentations used by these researchers' institutions were endorsed by both students and external examiners and students did not appear to be disadvantaged by learning through others' presentations. Although negative views relating to the stress and anxiety, and poor learning opportunities were identified, according to this research students in fact prefered presentations to formal lecture.

This support can be linked to the benefits of learning through teaching. It is noted within 'learning matters' that:

> *'When students teach, the thinness of their knowledge is exposed to themselves and their instructors.'*
>
> Centre for Teaching Excellence (2006), *Learning Matters, 10*(2), p.1.

Furthermore, the idea of being motivated by autonomy or the ability to personalise learning experiences has been identified as linked to higher levels of student engagement with learning tasks (Wood, 2003; Williamson, 2010). Mixed with the opportunity to divide workload, and present findings, group investigation was selected to replace a traditional lecture.

Implementation of group work
Participants
Opportunistic sampling was employed to recruit students enrolled on an 'Introduction to Individual Differences' module. A total of 17 students attended the lesson in which this task was introduced, of which 14 participated in the group presentations the following week.

Group task 1
Students were given a lecture on personality, which introduced the topic. They were then informed about the group investigation task and divided into groups of between five to three people. Students were asked to work with those they were sitting with (perceived to be friends) however, due to tutor manipulation of seating arrangements prior to the task, some students, through this allocation process, were working with people they did not know well. This means of grouping students allowed for a mixture of friendship and non-friendship groups, so to explore the impact of group cohesion on group work. Furthermore, the means of allocating groups was perceived as less likely to alert students to a manipulation of this variable and thus reduce bias findings.

Groups were allocated a perspective on personality, for example, trait, humanistic,

psychodynamic, from which they were asked to select a theory to research and present back to the group the following week. The introductory lecture also offered guidance on the roles and activities of the group, thus reducing cognitive load associated with group work involving minimal guidance (Kirschner, Sweller & Clark 2006).

Bearing in mind Sander, Sanders and Stevenson's (2002) reports of stress and anxiety associated with presentations, these presentations were conducted in an informal manner in which students were allowed to sit or stand and read from their notes. Following completion of the presentations students took part in a reflective seminar in which they provided feedback on their experience of completing the task and its impact on their learning and engagement with the topic. Discussions took the form of an unstructured focus group in which students led the topics discussed. Feedback from this session was recorded by a student on work experience and then used to modify a further group task.

Findings and modifications
Data gathered during the reflective seminar identified a number of issues both positive and negative. Firstly, students found the informal nature of the presentations allowed them to relax and have a more pleasant learning experience. Students also reported this learning activity to be more interesting than previous lectures, explanations around these comments focused on being involved and being able to explore what they wanted to. Finally, the students identified an appreciation for having only one approach to research:

> *'It was nice to like, only having to look at one theory. You could sort of go into more detail, which you wouldn't have time to do if you had to cover all of it.' (Survey participant 7)*

On the other hand students indicated they had learnt little from the other group's presentations, a negative factor of group work noted by Slavin (1996). This situation may have been exacerbated by the lack of an assessment for this module requiring a knowl-

edge of all the topics covered, by assessing the content presented by other students there may have been an increased motivation to understand this additional content. Furthermore, attendance at the presentation date was low, suggesting a lack of group cohesion/ motivation to 'stick with the group'. In addition, groups with missing students reported limited communication with those in their group, a situation some students attributed to being unfamiliar with members.

Group task 2

In response to the feedback relating to this initial group task, a second group task was introduced. In order to improve both attendance and communication issues identified by the students, the task was completed during lecture time. It was hoped that the allocation of time in which all group members were required to work on the task would remove issues around availability and methods of contacting group members. This situation also allowed for tutors to monitor attendance. It was hoped that this variation would overcome the impact of low group cohesion in non-friendship groups.

This time students were requested to work in different groups, a request not uncommon in seminars and workshops, thus requiring those in friendship groups previously to work with those they were not as familiar with and those in non-friendship groups to select students they felt most comfortable with. Students were then presented with an identical task relating to researching intelligence theories.

Data collection

Following the completion of both tasks a total of 14 students (five males and nine females with an average age of 21) completed open-ended questionnaires exploring their responses to the two group tasks and comparing their perceived engagement and learning on these tasks to tutor presented information. Following the questionnaire all students were emailed regarding the friendship status of their group and invited to par-

ticipate in a follow up interview which explored their responses further. From this original sample three males aged 18, 18 and 26 expressed a willingness to be interviewed regarding their experiences.

A semi-structured interview approach was used to gather additional information from participants, expanding on questionnaire responses and obtaining clarification around the meaning of these responses, preventing any misinterpretation when analysing survey data. A deductive thematic analysis was conducted on responses provided through both interviews and open-ended questionnaires and semantic themes were developed. The process of data analysis outlined by Braun and Clarke (2006) was adopted, following an essentialist paradigm.

Findings/Discussion

From the dataset comprising information relating to the key aims of enhancing motivation and knowledge, two main themes were extracted (see Table 1).

Theme 1: Friendship/unfamiliar members

Although discussion of the role of friendship was not introduced by the interviewer, there was a high prevalence of discussion around friendship, or the degree to which students knew their group, and the subsequent impact on their engagement and learning.

Responses highlighted the role friendship had on the interaction levels between the group members. Communication was seen as a vital benefit of group work:

'I was able to discuss my views and hear the views of others.' (Survey participant 9)

'Chance to give my opinions.' (Survey participant 3)

When working within friendship group's communication was reported to be more open, allowing students to discuss and clarify their understanding. In comparing the ways in which they worked within the two group tasks Interviewee 2 illustrates the difference between how he approached not understanding information in the first group (in

Table 1: Themes from thematic analysis of survey and interview datasets.

Themes	Subthemes
Friendship/the unknown	Communication
	Support (towards and from)
Self/external involvement	Guidance and validation
	Responsibility
	Personalising

which he did not know people) and within his friendship group who worked together on Group task 2.

'because there is no point writing something down that you don't understand so I was just writing down the stuff that I do understand, whereas, in the second one [group task] because there was three of us and we were all talking about the stuff we did understand and if we didn't understand we would ask someone else in the group if they had an answer so it was easier to understand.' (Interviewee 2)

This extract would suggest that deeper learning is facilitated within friendship groups as access to the meaning of information is more freely exchanged within the group. The interviewee makes the following conclusion as to why he approached these groups in different ways.

'If you don't know anyone its harder to open up to them.' (Interviewee 2)

In addition an impact of friendship on the numbers of avenues for communication was presented by Interviewee 3.

'Because we couldn't really meet up that much we went over it with Facebook chat and social media, MSN when we could.' (Interviewee 3)

According to literature relating to co-operative learning, interaction is a key element to the success of group work (Slavin, 1996). Furthermore, Piaget (1952) identified the role discussion has on opportunities to identify cognitive inconsistencies which lead to knowledge enhancement. These theories are supported by this dataset and are clearly enhanced by friendship.

Support

Further to the comparison of communication within friendship and non-friendship groups, a distinction was made between the support perceived to be offered by friendship groups and to be absent by non-friendship groups.

'They would say that they would do this specific approach, but for me it was like well I don't really know them that well so I don't know if they are going to do that or change their mind.' (Interviewee 3)

'because luckily I sat with two people I am ok with, I mean there's not anyone in the class I'm not ok with in all fairness, but because I sat with somebody I'm ok with and they carried their own weight, so it wasn't two people working for free, everyone actually did their work individually for the common goal.' (Interviewee 1)

There was a degree of trust towards the friendship group which was clearly lacking within the non-friendship group. Conversely, students illustrated how they perceived their responsibility to support their friends in these activities.

'they are with the people they know, if they are all going to fail, they are going to fail together and they know that and then like in the groups a lot of people didn't come in because they didn't think anyone else was going to come in.' (Interviewee 2)

'I didn't want to let anyone down.' (Interviewee 1)

Non-friendship groups were seen as leading to disagreements around decisions as opposed to a supportive environment for working on a task.

'There would have been arguments over who wants what part, what parts easier, what parts harder, it would have caused a lot of trouble.' (Interviewee 1)

'That was totally unorganised and unplanned. I think with the first one, because we were with people we actually knew, the chemistry of dong the group presentation was much better.' (Interviewee 3)

These findings would suggest that by working within a friendship group the cognitive load associated with managing the learning environment is reduced as decisions are made and supported quickly, perhaps as a result of the trust within these groups that the best interests of the group motivate student's actions.

By combining the contrasting experiences of group work within friendship groups and non-friendship groups within this sample of students, both the positive (Florez & McCaslin, 2008) and negative (Pauli et al., 2008) experiences of group work presented in the literature can be seen within this cohort. It is possible that friendship may go a way to explaining these contrasting experiences presented in the literature, as it appears to explain the contrasting experiences within this group.

Theme 2: Self/external involvement

The second theme extracted from the dataset was that of self and external involvement. The data indicates that in addition to students' valuing the role they played in their learning, they also valued input from external sources, i.e. the tutor, for support and guidance. The inclusion of both of these aspects was suggested to provide the optimal learning environment.

Self-involvement

A major benefit reported from the students was the opportunity to explore the research themselves.

'Because it's more independent, i.e. we have to research for ourselves.' (Survey participant 7)

'Interesting way of working, we have to do the work ourselves so more information is remembered.' (Survey participant 14)

The latter extract reflects theory around the impact of active participation on learning (Prince, 2004). By putting students in a role in which they actively engaged with the material, making choices and expressing preferences allowed them once again to take a deeper approach to learning. The positive perception of this experience is also evidenced in the literature relating to ownership (Wood, 2003).

Responsibility

The second sub-theme within the theme of self and external involvement was that of responsibility. The personalising of the learning appeared to lead to responsibility being placed on the student themselves to understand the content. This was compared to external involvement in information presentation, were students reported being able to get away with not understanding a lot of what was covered.

'you can always go to a lecture and be told the information but not really understand it and just leave it at that, but with a group presentation because you want to do well you want to take on all the knowledge and understand it.' (Interviewee 3)

This emphasises the need for deeper learning within this context in order to support this responsibility for understanding. This responsibility was also linked to the goal of producing a presentation:

'Well when everything's presented by a lecturer people switch off and like and when you're writing stuff down you don't understand it as much but when you read stuff and make notes yourself and then have to present it you have to understand it unless you want to make a fool of yourself.' (Interviewee 2)

The public presentation of what had been learnt was linked, by a number of students, to the potential for embarrassment. This embarrassment may explain the motivation to learn, compared to the lack of motivation to learn/understand lecture content. Not only is the knowledge gained being illustrated to the rest of the group but the responsibility for that knowledge gain is placed on the student.

'I don't think anyone wants to turn up on the day and embarrass themselves in front of everyone else.' (Interviewee 3)

A combination of friendships impact on perceived support and the impact of failure on the self, may explain why there was so much absence within non-friendship groups, illustrated by Survey participant 14's response to questions around the key weaknesses of the group tasks.

'Lack of participation from other group members.' (Survey participant 14)

External involvement

Although students took on board responsibility for their learning the value of the tutor, for clarifying any misunderstandings presented by other groups, was noted;

'Might misinterpret info.' (Survey participant 3)

'Didn't fully understand theories researched and presented by others.' (Survey participant 6)

Similarly, the in-class task was seen as particularly valuable as it provided the extra motivator of the tutors presence, to keep students focused during the allocated time.

'because it's supervised we pulled our weight more.' (Interviewee 1)

'someone sees the lecturer coming around someone's going to get up and say like we need to do this, we need to do that, I think that would motivate some people to do it.' (Interviewee 2)

There is also suggestion around the impact of allocated time by the tutor on student's engagement with the task.

'There was less time to gather the information but this meant we had to be more focused and precise.' (Survey participant 8)

'Did it better as I got to do it straight away in class.' (Survey participant 9)

These extracts illustrate a benefit of time allocated to focus on the task. It is possible that as the presentation was not assessed students found it difficult to prioritise this work above other study deadlines when outside of the classroom. By providing class time to engage in the task students did not need to prioritise the task alongside other assessed activities, thus allowing them the opportunity to engage.

Knowledge gain

As mentioned previously, it is evidenced within the literature that positive perceptions of learning tasks do not always equate with achievement of learning outcomes (Delucchi, 2007). Therefore, in addition to questionnaires and interviews, multiple choice quizzes were utilised to compare knowledge levels relating to topics taught through the two group presentations and tutor presentation.

Each quiz comprised of 26 multiple-choice questions within a conventional format which corresponded with guidelines for assessment presented in Haladyna, Downing and Rodriguez, (2002). Providing these quizzes on the students VLE was consistent with previous module activities and allowed students to complete the activity in their own time, thus reducing the burden of data collection for students. However, it must be noted that this approach may also have introduced bias.

Following this additional data collection descriptive and inferential analysis was performed on the data.

Findings

A total of 16 students responded to one or more quizzes and nine students responded to all three quizzes. Mean scores for each quiz are presented in Table 2.

These findings would suggest that students learnt more during group tasks (with means of 53.8 and 48.1) than during tutor presentation of information (mean=43.1). Of the two group tasks the task outside of lecture time was associated with the highest mean achievement score (mean=53.8). However, t-tests indicated no statistically significant differences (personality-emotion, $p=.092$; intelligence-emotion, $p=.310$.).

Following completion of the quizzes eight students disclosed their friendship status within their groups. A comparison

Table 2: Comparison of quiz scores for group activity topics (Personality and intelligence) and topic presented by tutor (Emotion).

Topic	Presentation style	Mean score (standard deviation in brackets)
Personality	Group task outside of lecture time	53.8 (9.6)
Intelligence	Group task within lecture time	48.1 (12.3)
Emotion	Tutor presentation	43.1 (14.7)

between scores for those reportedly in friendship groups compared to non-friendship groups (Friendship mean=51.25, unfamiliar group members mean=49.37) shows a small increase in scores for the friendship groups, unfortunately the sample size was to small to control for topic area.

Again, no statistically significant difference between friendship and non-friendship groups quiz scores were identified (p=6.71).

Limitations of research and plans for further research

Unusually, all those students offering data through interview were male. This is not a representative sample given the under-representation of males within psychology courses. It is, therefore, important to consider the differential experience of this group work on female students. This research represents one semester of the module and, therefore, it is possible that the success of group work activities maybe the result of increased competence as the module progressed. This order effect could not be controlled for within one presentation of the module.

In addition measures of knowledge do not take into account the past knowledge of students, their general levels of intelligence, or the variations in settings in which the quiz would have been completed given its availability on the VLE. These limitations may explain the contrasting impact of group approach and friendship on learning as represented by student reports verses quiz results.

Finally, those students who attended all lesson slots may be more motivated to learn, these students may not be representative of the performance of all students if required to complete the task. They are also the students who are perhaps more likely to give more to group tasks which require working outside of lecture times and, therefore, the higher achievement level associated with the group task outside of lecture time may not represent the populations success.

Recommendations

Group work introduces a number of interplaying factors into the learning environment. The aim of this research was to assess the relative value of group work compared to tutor presentations for enhancing engagement with the task and topic knowledge. It is, therefore, difficult based on this initial data to pinpoint the source of this engagement and knowledge enhancements. In order to further specify the necessary components of group work in this context a number of further avenues of research need to be explored. However, based on this current data, and baring in mind the limitations of this research presented above, the following recommendations can be made.

1. By incorporating presentations into group work students are presented with a motivation to understand the topic.
2. Motivation to understand lecture material must be reinforced.
3. Students given the opportunity to select friendship groups for group projects may benefit from more open communication which enables them to discuss the topic within the group.
4. Learning from student presentation of information needs to be further reinforced, supplementing this with

additional means of presenting information such as follow-up tutor presentation or summarising of other group's content.

5. To reduce the impact of student communication skills on the successful communication of group information to the class as a whole, groups may be required to present their findings in additional formats such as leaflets or websites.

6. Students may benefit from being provided with opportunities to personalise the topic area they can study and to collect information.

Future research

As mentioned earlier there are a number of components within these group tasks that may have contributed to the success of these approaches, and a number of limitations with this current data which need to be addressed in future research. However, of particular interest to the researcher is the relative impact of group tasks in which students can personalise verses tasks in which the topic cannot be personalised. Such a comparison would evidence the role this factor plays in the benefits illustrated through this group work.

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