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Students' experiences of working in engineered diverse groups: Panacea or Pandora's Box?

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Abstract

Group work has been widely adopted in business schools and is lauded for having various pedagogic merits. Yet there is considerable debate as to how to best form groups to achieve benefits while mitigating difficulties.

Within this paper we examine the use of an engineered group allocation method for student groups undertaking a yearlong group project within a second year undergraduate research methods module. We address two primary research questions:

1. What were students' experiences of the engineered group experience?
2. What impact did the group allocation method have on students' learning?

We undertook in-depth semi-structured interviews (n=22) lasting between 15 to 47 minutes. All students who undertook the module were invited to participate in the research. The interviews were transcribed and a thematic analysis was performed.

While prior work has highlighted the problems of free-riding we provide an analysis of phenomenon we have termed *forced-riding*. Forced-riding captures the phenomenon in which students are excluded from contributing, or force others not to contribute. We argue that this is rational behaviour, and can be in part attributed to the heterogeneity resulting from the engineered allocation method.

The central value of this paper is that it gives priority to student voice, highlighting the manner in which students' perceive their group working experiences. We conclude the paper with the presentation of a matrix of variable contribution. To our best knowledge, this is the first presentation of such a matrix, and we contend that it has value for a range of stakeholders.

Learning
Group work
Free-riding

1. Introduction

The use of group work is a well established pedagogic practice in business schools (Schullery and Schullery, 2006). Reviewing the literature one may come to conclusion that it is panacea for a range of educational ills, and has diverse pedagogic merits. For example, Bentley and Warwick (2013) argue that for students, group work is among the most effective ways of advancing communication skills and gaining new knowledge. Further, it has been suggested that group work can lead to enhanced decision-making, conflict resolution and problem solving (McNally, 1994), oral communication, active listening, and development of group leadership skills (Tribe, 1994).

However, there are numerous barriers to achieving the purported benefits of group working, in particular issues of variable student contribution have occupied a great deal of space in the pedagogic literature, being a common problem (Maiden and Perry, 2011).

Students' perceptions of group work vary (Bourner et al., 2001; Wosnitza and Volet, 2013), and are often negative. Participants in Bourner et al's (2001) study highlighted the following issues as amongst the least liked: difficulties of negotiating in the group, working with certain others, working with unmotivated people, unequal work loads, issues with time allocation and dependence on others.

A question that arises for educators is how to create and manage group work such that it provides benefit while avoiding or mitigating difficulties. One approach is to modify allocation methods. There are three broad methods for selecting students for working in groups, these include allowing them to self-select group members, randomly allocating students, or engineering allocation to groups on the basis of different demographic or other factors, and each has potential benefits and disadvantages (Huxham and Land, 2000).

The manipulation of allocation methods may provide an opportunity to mitigate some of the difficulties listed. For example, allowing students to self-select may enable students to avoid working with others that they know to be difficult, unmotivated, and so on. Allowing students to select a partner to work with, and then randomly allocating pairs to the group can ensure diversity, while retaining some of the benefits of self-selection (Davies, 2007).

Within this paper we examine the use of an engineered allocation method for forming student working groups undertaking a year long group project within a second year undergraduate research methods module. We address two primary research questions:

1. What were students' experiences of the engineered group experience?
2. What impact did the group allocation method have on students' learning?

2. Literature Review

Group formation

Of the multiple ways to assign students to groups (Huxham and Land, 2000) allowing students to self-select is by far the most common method and evidence suggests that students generally prefer this approach (Analoui et al 2014, Chapman et al 2006, Mason 2006, Burdett 2003). In a comparison of self-selecting and randomly allocated groups, Chapman et al (2006) found that the former generally had a better experience in terms of enjoyment, making new friends (easier

because they had selected) and were happier with the output of the group, having a higher disposition toward group work generally. The randomly constructed groups spent more time on task.

Yet, heterogeneous groups do provide benefits, Schullery & Schullery (2006) identified that heterogeneous groups experienced positive developments in communication related skills, with females reporting a significantly more positive experience when working in heterogeneous groups, while males reported a homogenous group as providing a better experience and outcome. Similarly, Curseu and Pluut (2013) found that in order to achieve the desired benefits of group work, there needed to be a mix of gender, nationality and at least 1 high performing/highly motivated team member. Further they identify that there is a potential for group members to learn from highly motivated team members, if the high performer has a disposition toward group cohesion.

The type of group provides a basic structure that potentially presents students with different challenges, and different resulting perspectives on team work. However irrespective of group formation there are other potentially important issues that can have an effect on the student experience and are closely tied with the group type.

Tutor, task and structure

Winstanley (1992) argued that for true collaborative learning to take place the group project needs to be over a "sustained" period. In a term-long group task (over a term) Woznitza and Volet (2014) found that students attitude to group work was partly influenced by past experience, however negative perceptions can be overcome where there is a structured approach to the task and significant input by academics. Where group based activities are shorter, it could be argued that insufficient time exists for the group to effectively navigate fully all the stages of group development (Tuckman, 1965).

The value of pre-group work instruction has been identified by several authors, in particular Khosa & Volet (2013) applied pre-group work instructions to one self-selecting group and compared the results against a self-selecting control group. They found that the experiment group engaged in more content related activity, found the task less challenging, and group control processes less onerous than the control group. Furthermore, students have pointed to the potential value of doing group related work in scheduled class time (Abernathy & Lett 2005)

Some authors have pointed to the potential for task construction and tutor intervention to help alleviate some of the above problems (Analoui et al, 2014). However, Volet and Mansfield (2006) suggest that too much structure and intervention may lead to a reduction in potential learning and the development of skills as students rely on the tutor to deal with dysfunctionality. It may also act as a sanction for high performing students to intentionally exclude low performers from contributing, especially where there is a strong peer assessment process.

Student experiences of group work

Many authors have reported positive outcomes and experiences for students, but this has generally been overshadowed by the generally negative experience that undergraduates seem to

have (Hassanien 2006, Schullery & Schullery 2006, Khosa & Volet 2013, Maiden & Perry 2011, Chapman et al 2006, Burdett 2003).

Positive experiences of group work include making friends, working with other cultures, and the development of employment skills, subject knowledge and improvements in grades over individual tasks. Despite the pre-eminence of negative experiences, some research exposes a generally more positive than negative view of group work, especially where a general survey of students is involved. For example, both Burdett (2003), and Hall and Buzwell (2012) found that students were well disposed toward group work, citing in particular the ability to make friends, exchange ideas and learn, and improved grades.

Negative experiences of group work tend to revolve around two separate but interlinked core issues - the management of the group process, and the issue of unequal contributions. It is perhaps in the latter area where most negative aspects of groups work has focussed, and is referred to as free-riding or social loafing (Abernathy & Lett 2005). There has been a tendency to conflate these terms in order to frame the general situation where there are unequal contributions made to group work, specifically to label those contributing below expectation. A more precise understanding of the difference is to view free-riding as a more severe form of social loafing (Maiden & Perry 2011, Abernathy & Lett 2005). However it is perceived, free-riding is commonly cited as the key concern of students when working in groups (Hall & Buzwell 2012, Hassanien 2006, Livingstone & Lynch 2000, Abernathy and Lett 2005). However it is not viewed the same way by all students. It seems that the higher the student performance, ability or motivation then the more concern a student has for the issue of unequal marks (Volet & Mansfield 2006, Abernathy and Lett 2005). In an application of game theory Pitt (2000) predicted that higher performing students will complete the task themselves, excluding those whose work is potentially detrimental to the group performance, and several authors have identified this phenomenon (Chapman et al 2006, Volet and Mansfield 2006). Driving student concern about free-riding is student concern for grades, or grade expectation (Analoui et al 2013). The pressures of the contemporary employment market and competition for jobs have created an environment where grade expectation is overwhelmingly seen as the priority of doing a degree. For a student a grade is a palpable piece of evidence of their performance in University, and a potential step up on the bottom rung of the employment ladder. However the skills acquired by students during group work are not recorded in any formal way, but rather assumed to have been automatically acquired as a result of completing the course.

A final dimension of the student experience is ethnic-cultural diversity. Today's university campus is highly multi-cultural, and this mimics the nature of global organisations generally (Popov et al 2012, Elliot & Reynolds 2014). Whilst groups generally have challenges with regards communication, task management and general group management, these problems are significantly exacerbated where there is a mix of cultures within groups. Furthermore additional problems emerge with respect to language and background culture and learning preferences. Whilst the need to create an inclusive pedagogy on the campus is important, often the challenges result in institutional acceptance, if not reinforcement of the different cultures (Elliot & Reynolds 2014). Efforts to integrate different cultures at the classroom level, particularly through group work present a major challenge. However several authors have identified positive outcomes, in particular in terms of process benefits such as solution generation, exchange of ideas and improved appreciation of other cultures.

The problems associated with group working can be significantly affected by the approach taken to group formation, and the nature of the task that the group is involved in, as well as the nature and level of group management and support.

3. Research context

The context is a second year research methods module that is core on the Business Management programme in the Business School of large University in the North of England. Research Methods is a year-long module with a 30 credit rating. The background concerns that drove the use of group work for this particular module fall into a number of distinct categories:

- 1) Assessment loads. Increase in cohort sizes against a relatively static resource base. This particular cohort had witnessed an increase in numbers from 98 in 2009 to 165 in 2012.
- 2) The inadequate nature of the lecture-tutorial system as a teaching and learning platform for many types of module, and particularly for non-traditional students.
- 3) The need to provide the experience of a complete research process in preparation for the final year dissertation. In the 2011/12 academic year the module was delivered using a more traditional approach of lecture and tutorial, and was failing to prepare students for the rigours of the final year dissertation.
- 4) The need to increase module attainment levels for all students, in particular, middle performers and international students. The university has set a target that 75% of all students should be achieving a minimum of a 2:1 classification at module level.

Subjects

There were a total of 165 students on the module. The demographics of the cohort were as follows (see Table 1):

Table 1: Cohort demographics

Student type	Female	Male
Home students	40	73
International students (Chinese)	9	21
International students (Other)	7	15

The module is classed as a 30 credit module, requiring 3 hours of input per week. There is 1 x 50 minute lecture and 1 x 2 hour seminar. All students attend the lecture where theory is delivered and there are 6 seminars. Within each seminar there are around 25-30 students. Within each seminar 5 groups were formed, each group containing 4-6 members

Group formation

Groups were formed based on a number of principles and evidence from literature suggesting that heterogeneous groups generally provide better outcomes to homogenous ones especially over longer assessment periods (Curseu & Pluut 2013, Watson 1993). However the process was not random, it involved identifying 3 generic groups, namely high academic performers, middle academic performers and international students. The first stage involved asking students to pair

themselves off with a partner that they had a preference of working with. This produced highly homogenous pairs, as students tended to gravitate to similar types and friends, and international students naturally paired off on a cultural basis. The objective here was to retain some sense of security and safety of working with someone you were familiar with, a common reason voiced by students for preferring to self-select groups (Mahanthiran and Rouse 2000). For each paired group the average mark (where it was available) from their first year was computed, with a pair scoring over 60 classed as high performers, and those below 60 as middle performers. The second stage involved the creation of the groups. The tutor took one high performing and one middle performing pair per group adhering to the rule that the average mark of the two pairs needed to be as close to the cohort average as possible. However within this process every effort was made to try and ensure diversity in terms of performance, so for instance avoiding having 4 students with similar performance. Additionally, every effort was made to balance the gender mix within each group. Despite the efforts to balance groups experience exposed several other problems related to culture, in particular the different cultural attitudes to gender roles. Groups of 6 were then engineered with a pair from each of the 3 generic categories identified. There were a total of 30 groups with 4-6 members. However in a small number of cases groups were created from latecomers (mainly international students) producing largely homogenous groups.

Task and assessment

The module delivery structure was developed in order to facilitate the observation of aspects of group work, and as such consists of a group based research project that lasts for 18 weeks. The task involved each group identifying and researching a topic related to business and management and then to work through the sequential stages that normally comprise of an undergraduate dissertation. Table 2 indicates the schedule of activities involved in the process over the period of the project.

Table 2: Schedule of activities

Teaching week	Lecture topics	Seminar activities
1-4	Module introduction, group work, management research and topic choice	Group work instruction & group formation. Research topic development. Develop Written report. Presentation week 4 (Summative 5%)
5-8	Literature review-objectives, structure, search strategy, academic writing.	Literature searching. Theme development, research aims, add to written report. Presentation week 8 (Summative 10%)
9-11	Research types, qualitative & quantitative research, developing and distributing surveys (Survey monkey, Google docs). Population & sampling.	Identify methodology, develop survey, link to literature themes, add to written report. Presentation week 11 (summative 10%)
12-16	Data analysis and interpretation, Statistical approaches, thematic analysis, using software-Excel and NVIVO.	Distribute and collect surveys, carry out interviews, code data, enter data, analyse and interpret. Add to written report. Presentation week 16 (Summative 10%)
17 & 18	Writing up your research. Classic structures. Conclusions and discussions.	Finalise/edit written reports. Submit week 18 (Summative 40%)

Students were given some input early on in the module explaining the way groups are formed, how they work, tips on organisation and also a thorough brief on the nature of the task. The module

tariff is completed by an in-class, multiple choice test that examines the students breadth of knowledge about research. This assessment accounts for 25% of the module total.

Group management

The group work process in this study deviates from the more common approach in that the group work takes place in class (Groups still met outside of class at their own volition). This allowed a much closer level observation and support by the tutor and acted as a platform where group problems could be dealt with, an often cited requirement voiced by students (Burdett 2003, Woznitza & Volet 2013). It was also considered necessary because of the lack of developed group management skills for undergraduates (Analoui et al 2014). This approach also enabled issues such as unequal contributions to be more effectively dealt with, but also addressed management problems such as organising group meetings. Several sources were drawn on to compile an effective approach to unequal contributions, namely rationale for using peer assessment (Gielan et al (2011) and Maiden & Perry's (2011) list of peer assessment techniques. A robust peer assessment system was used whereby group members would apportion marks amongst the group. This occurred at 3 points in the 18 week project and was intended to alleviate student anxiety with regards to contribution. In cases where groups became dysfunctional to the point of affecting group performance a Viva system was utilised whereby the tutor investigated issues and ultimately took the responsibility of resolution. In extreme cases individual students would be withdrawn from groups and provided with alternative individual work.

As can be seen in Table 2, students were briefed fully at the start of the module in order to foster an open discussion about group work generally. This was productive in that students' fears could be alleviated somewhat. Although at this stage there was a considerable level of resistance and observable stress.

4. Data collection and analysis

We were concerned with understanding students' experiences of group work. To that end we undertook in-depth, semi-structured, one-one, face-face interviews (n=22) lasting between 15 to 47 minutes. All students who undertook the module were invited to participate in the research and students from the following groups participated (see Table 3).

Table 3: Demographics of participants

Category	Male	Female
High performer	3	7
Moderate performer	4	3
Overseas	3	2

A number of questions were asked to all participants, which were guided by a desire to understand participants' experiences of the engineered allocation method. Core questions asked to this end include:

- Can you please describe some your experiences of group work during this module?
- Have you had any positive experiences?
- Have you had any negative experiences?
- What are your thoughts on the way in which groups were assigned?
- How would you prefer to be assigned to groups?

In an attempt to explore participants' experiences thoroughly, we often embarked upon lines of questioning around topics which were pertinent to the individual.

The data was analysed using thematic analysis, a method by which patterns within data are identified, analysed and reported (Braun and Clarke, 2006). Following advice within the literature we undertook an iterative process (Stake, 1995 and Richards, 2009) which, following Braun and Clark (2006), was comprised of a number of stages.

Following data transcription, initial codes were inducted from the data, which were used to label chunks of data according to meaning. Codes were examined and on the basis of this themes were generated which allowed data to be meaningfully collated. Once grouped under these themes, the codes and data extracts within the themes were further reviewed and examined to ensure the collation had been meaningful. Themes were then explored, and meaningful sub-themes that reflected particular and distinct patterns of meanings within the themes were identified. Themes and sub-themes were then reviewed to ensure internal homogeneity and external heterogeneity (Patton, 1990), to this end it was determined that data extracts within themes and sub-themes cohered meaningfully, while also being distinct from those within others.

The flexibility of the thematic approach places the onus on the researchers to demonstrate explicitly and clearly the process undertaken (Braun and Clarke, 2006). To that end examples of the initial coding and data extracts are presented (see Table 4), as is a diagrammatic representation of the manner in which codes were grouped into themes and sub-themes (see Figure 1). Further, throughout the following section, detailed quotes are given to allow the reader to make their own interpretation of the data and to bring the reader closer to participants' experiences (Stake, 1995).

In all participant quotes, the following form of identification (CATEGORY-GENDER-IDENTIFIER) and notation is used:

- HP – High performer
- MP – Middle performer
- I – International

- M – Male
- F – Female

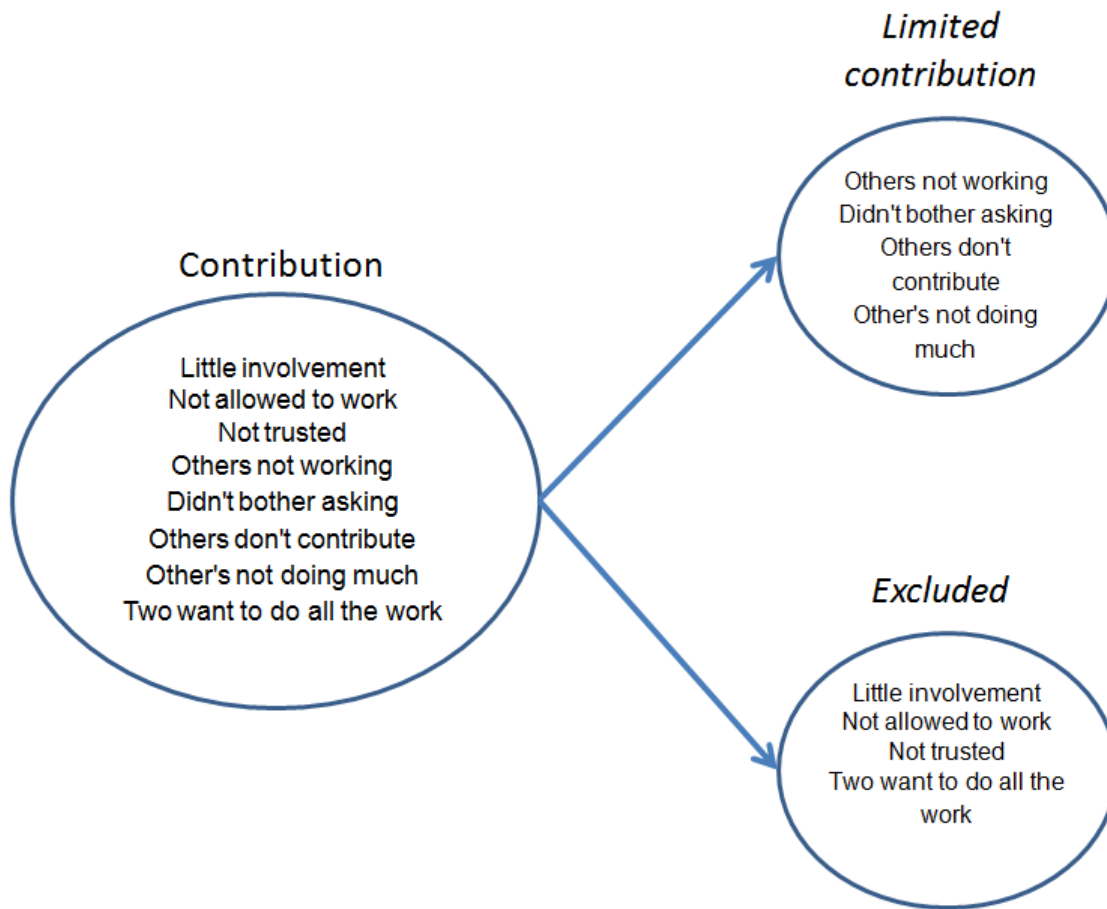
Thus, MPF1 below refers to the first middle performing female student in the sample, whereas MPF2 refers to the second.

Table 4: Sample of data extracts and codes for theme of contribution

<u>Data</u>	<u>Code</u>
MPF2: if we didn't have no lectures and it was just group work that we had to do, I wouldn't know what I was doing because there's not much involvement.	Little involvement
MPF1: people didn't allow me to do it and I'm not being trusted,	Not allowed to work Not trusted
MPM1: I remember my team leader was	Others not working

<p>actually asking them have you done this and they said no and then he'd ask them have you done this and he said no. And then it got to a point where he just wouldn't bother asking them,</p>	<p>Didn't bother asking</p>
<p>DD: Is that what you're saying that you're actually having to basically draft or proof read everything that's given to you yeah?</p> <p>HPF7: If they did something yeah.</p>	<p>Others don't contribute</p>
<p>BA: And you're saying Chloe and Ellie aren't doing much?</p> <p>MPF1: Yeah.</p>	<p>Other's not doing much</p>
<p>MPF3: Um some people like, two...like we, like we have two people who like to lead so they are some arguments sometimes and they like want to do all the work,</p>	<p>Two like to lead Arguments Two want to do all the work</p>

Figure 2: Diagrammatic example of the mapping of codes, themes and subthemes



5. Findings and discussion

Within this section themes pertinent to providing answers to researcher question 1 and 2 are presented and interpreted. Throughout, and taking in to account the limitations of space, detailed quotes are given to allow the reader to make their own interpretation of the data and to bring the reader closer to participants' experiences (Stake, 1995).

5.1. Research Question 1

To provide an answer to first research question, we report the themes of pairing, and positive and negative experiences. Data were included in the latter themes if they met the following criteria: the participants prefaced their comments with the words positive or negative, or comments were made in response to questioning about positive and negative experiences.

5.1.1 Pairing

Participants noted that it was beneficial to know one person they were working with within the group.

MPM2: I think that's a really good thing that you did as well because then you can have someone familiar with you. Cos if you just go into summert and you don't know who everyone is, it could get lonely for some people.

Second, it was reported that the use of pairing created cliques that sometimes remained separate:

HPM3: I think maybe like if you were pairing up with.... I know some groups have paired up with other groups and the other groups still kind of not really contributed. They've not tried to come out of that little group that they were in to start with.

Thus, we would argue that pairing allows for some of the benefits of heterogeneous group working (Curseu and Pluut, 2013), while increasing the security of self-selection (Strauss and Young, 2011) and reducing the distress associated with a loss of control over membership (Chapman et al, 2006). However, that cliques did emerge and did not dissolve demonstrates that pairing does not entirely overcome clustering but does produce an improvement over self-selected groups (Davies, 2007).

5.1.2 Positive experiences

Positive Experiences

A variety of aspects of the group work experience were described as being positive. First, it was apparent that for many students prior experiences of group work involved self-selecting in to groups. Thus, the engineered allocation method adopted provided a new experience of group work. Second, it provided students with an opportunity to meet new people:

MPM3: Hmmm, I like the fact that you like mixed the groups up...but you do get to know a lot of other people and how they work and you do get to like express yourself as well

Third, the allocation method also enabled participants to gain new insights into the way business and management is conducted in other countries:

HPF4: And obviously from like their countries they've given us ideas of what happens there in similar situations to what we've been researching.

These findings are consistent with prior literature (see for example, Hassanien 2006, Schullery & Schullery 2006, Khosa & Volet 2013, Chapman et al 2006, Maiden & Perry 2011, Burdett 2003).

Fourth, it was reported that working in the groups allowed for the enhancement of academic skills, prepared participants for the final year project or dissertation, and enabled participants to learn how to work with people. The following are indicative of the comments made:

MPM1: Yeah because you get to see how other people work...and then you can try to better yourself the way how you work.

HPF1: Like I've seen it as a mini dissertation or preparing for your dissertation where, you know that's not gonna be a walk in the park is it? So I've took it as yeah it's been helpful, very, very helpful.

HPF2: Well the positive is I feel like I've learnt a lot based on next year like working with people...like tolerating people and I've learnt a lot about like basically understanding that people

The above findings are consistent with those of other researchers. For example, both Burdett (2003), and Hall and Buzwell (2012) found that students were well disposed toward group work, citing in particular the ability to make friends, exchange ideas and learn.

Some of the positives listed are attributable to the allocation method (meeting new people, making new friends, a new way of doing group work). However, that the group work allowed students to learn about the subject matter and prepare themselves for the final year research project or dissertation is somewhat moot. That the engineered allocation method enabled the module learning outcomes to be achieved is desirable, but this alone does not suggest that other forms of allocation method would not have achieved the same result.

5.1.3 Negative experiences

Although similar amounts of data were coded as positive or negative, the remainder the bulk of the interviews were taken up with discussions of the experiences described as negative by participants. This is consistent with the extant literature in which it is demonstrated that undergraduates seem to have generally negative experiences which foreshadow the positives of group work (Hassanien 2006, Schullery & Schullery 2006, Khosa & Volet 2013, Maiden & Perry 2011, Chapman et al 2006, Maiden & Perry 2011, Burdett 2003).

First, participants reported that levels of attendance were a concern. As noted the majority of the work that was to be undertaken by the group was to be done in class, and therefore a lack of attendance at in-class meetings caused discontent. The need to meet within and outside of class (to practice presentations, or catch up on work missed) was also described as being a source of dissatisfaction:

MPM2: some people don't attend, so you've got to like do more work yourself

Difficulties with timekeeping and task management have been reported previously (Behfar et al, 2006) and as that author notes may occur irrespective of the diversity of groups.

Second, participants highlighted difficulties with communication as a negative experience within group work. While some participants highlighted general poor intra-group communication, more commonly reported was the inability to communicate with other students due to the presence of language barriers.

I1: Well I had first.... First in the beginning I had a problem with the group, communicating with them because I was the only international student with four home student

HPF6: Cos it's academic stuff that we have to do and obviously it's a degree so there's specific standards, that you'd think that they'd [international students] be capable of doing... Like meeting, but they're not

Prior research has demonstrated that multicultural groups have difficulty with communication and language (Popov et al, 2012), and that developments in communication skills can sometimes be made (Schullery and Schullery, 2006). While these two contentions are borne out by our data it is evident that communication issues caused by language may not have occurred if students self-selected.

Third, conflict within groups was described as a negative experience:

HPF1: I don't mind working in groups personally, it's alright but there's always gonna be conflict in a group and it's been the same this year

Conflict is a common feature of groups and is deemed necessary for group development and performance (Tuckman, 1965). Whether that ultimate performance is beneficial, and whether the benefits that are accrued mitigate difficulties encountered when compared with self-selection, random, or individual working is not evident within our data.

The final and most reported negative experience related to the level of contribution made to the work of the group either by the participant, or by others. This captures the difficulty with free-riding that is oft reported in the literature (Ballantine and McCourt Larres, 2007; Maiden and Perry, 2011; Popov et al, 2012). There were four principle areas of difficulty: A lack of contribution from others, the need to do the work not done by others, the lack of quality in the contributions from others, and finally, being excluded from contributing.

These experiences (and others related to contribution) are described in the following section as they are pertinent for answering research question 2.

5.2 Research Question 2

Based on the assumption that the extent of contribution is related to the degree of learning that takes place, we argue that the group allocation method inhibited the learning opportunity of some participants while increasing that of others.

First, consistent with prior literature, it was evident that free-riding or social loafing occurred. This was captured within the themes of limited and non-contribution. The following is indicative of the comments made:

MPM1: I remember my team leader was actually asking them have you done this and they said no and then he'd ask them have you done this and he said no. And then it got to a point where he just wouldn't bother asking them,

The reasons for variable contribution were not always provided. However, some participants highlighted that a significant issue was an inability to communicate due to language barriers (as described in 5.1.3). Issues with communication and language are common in multicultural groups (Popov et al, 2012) and we argue that when students are unable to communicate with each other the opportunities for learning from each other are reduced. Further, if students need to spend time translating, or trying different methods of communicating then this necessarily reduces the time available for more productive activity.

Similarly, it was reported that the quality of work provided by some students was not up to the desired standard of the participant or their group. The low quality of work was often attributed to international students' lack of ability with the English language. Some participants described trying to overcome the language barrier, and helping and explaining what was required to their international counterparts:

HPF1: And sometimes we have to edit it a little bit but sometimes we have to reteach them and say.... Well not reteach, maybe just go

over this and explain this little bit or something or something like that.
But yeah, I'd say cultural language barrier that's caused a bit.

We contend that the time spent by home students helping other students may not be the most productive use of their time - by spending time working with and developing others, they lose time to engage in their own tasks. More commonly participants often reported having to do additional work, either to compensate for the work not done by others, or to re-do or fix the work produced by their colleagues whose work they perceived as lacking quality:

HPM2: I know for a fact that I put more effort in that I would usually have to put in... we're constantly three men down, four men down and it gets a bit tiresome after a while.

It could be argued that this increase in workload experienced by some students may have had a positive impact on their learning. That is to say, that by producing or reproducing the work of others they were able to engage in more aspects of the group project and so enhance their knowledge and skills. However, assuming that students have a limited capacity for study then the additional work put into supplementing or producing the work of others must mean that less work is being done in other modules. Further, students whose work is being reproduced will not receive constructive unbiased feedback on their work from their tutor, and so their learning will be impaired.

While some participants reported doing the work of others, six participants reported being excluded from partaking in the production of the group report or the presentations, and one participant reported excluding others. Exclusion was experienced by international students, and those classed as mid-performing in our sample.

MPF1: If you asked me have I learnt something, I haven't learnt anything... I haven't done the work. I don't know nothing about methodology and I don't know nothing about data analysis because I haven't done anything...but that's not my fault because people didn't allow me to do it and I'm not being trusted, that's what I just feel like that's all.

MPF3: we have two people who like to lead...and they like want to do all the work, and in the end they complain that they've done everything.

MPM1: So I was there with him when I knew he was doing it in class but apart from that, he just wanted to do everything.

That some students' contributions were excluded is perhaps to be expected. Pitts' (2005) application of game theory to student group working argues that when marks are shared by the group, the rational outcome is to allow the best students to undertake the majority of the work, while those who are less capable support the most capable or do not interfere. Given that the majority of the marks were shared by students it is arguable that this may be what occurred.

This is not the first time that exclusions have been reported in the literature. Livingstone and Lynch's (2000) report that a participant revealed to them that a group member who was expected to obtain a first class degree produced the final report and presentation for the group by themselves, working only with the notes available to them. Volet and Mansfield (2006) report a different form of exclusion, in which, underperforming students are rejected from the group by their

peers. Such exclusions differ from those reported here. Students within our sample reported *wanting* to engage, but being denied the opportunity to do so while remaining in the group.

With respect to student learning this is problematic. When students are restricted from contributing their opportunity to learn from the work undertaken by the group is severely limited. We would argue that the use of the engineered group allocation method provides opportunities for the behaviour described by Pitt (2000), reported by Livingstone and Lynch (2000) and the exclusion described here.

The discussion within this section has demonstrated a number of differences with students' desire to contribute to group work with respect to both themselves and others. We have reports of students both wanting and not wanting to contribute, and wanting and not wanting others to contribute.

Based on this, we propose the following matrix as our theoretical contribution. The matrix is based on the proposition that a student's contribution to group work is determined by a) the extent to which the student desires to contribute and b) the extent to which the group desires the student to contribute. Placing these respectively along the x and y axes results in the following matrix (see Figure 2). In both cases, we understand these positions as continuums ranging from high to low, and recognise that the position an individual and the group occupies along both axes is not fixed and may change over time.

Figure 2: Matrix of variable contribution

HIGH Individual's desire to contribute LOW	Forced-riding	Contributing
	Mutually agreeable free-riding	Free-riding
	LOW	HIGH

Group's desire that the individual contributes

The matrix provides four positions: *forced-riding* in which the individual desires to contribute but the group desires they do not (i.e. exclusion), *mutually agreeable free-riding* whereby there is a mutual desire for non-contribution from the individual, *free-riding* whereby the individual does not desire to

contribute but the group desires that they do, and finally *contributing* in which there is a mutual desire for contribution.

We contend that the matrix and the underlying proposition account for the variable contribution observed within our study, and within the wider literature. We have reported experiences of all positions within this study with the exception of mutually agreeable free-riding – which is reported elsewhere (see Livingstone and Lynch, 2000). We contend that this matrix makes a valuable theoretical contribution to the literature, while many studies have examined free-riding at length (Hall & Buzwell 2012, Hassanien 2006, Livingstone & Lynch 2000, Abernathy and Lett 2005) little has been said about forms of exclusion. This is unfortunate, as exclusion denies the excluded the opportunity to learn, and increases the workload of those who feel the need to exclude.

Within our study the considerations governing the individual's desire to contribute, and the desire that others should or should not contribute is arguably best explained by a focus on attainment. Prior research has shown that students place a great emphasis on attainment during group work (Analoui et al, 2014) and value group work as a way to improve grades (Hall and Buzwell, 2012). We argue that this focus on attainment provides the best explanation for the observed phenomena: students undertake the work of others, allow others to do their work for them, seek the contributions of others and exclude others, when doing so will enhance their attainment. However, it is self-evident that other considerations (for example, other commitments, time, and interest) may also impact an individual's desire to contribute.

Finally, the findings and discussion presented within this section lead us to one answer to our second research question: that the engineered allocation method increased the likelihood of forced-riding and so inhibited student learning. The creation of heterogeneous groups in which communication between students was difficult hindered contribution, and differences in academic and language ability resulted in the reduced desire for the contribution of others amongst some students, resulting in forced-riding. Some of the difficulties reported may have been mitigated if students were able to self-select, and then selected others to work with who meet their expectations in terms of communication and capability.

6. Implications for practice

Students and educators need to be aware of the potential for exclusion, non-contribution and over-contribution that may occur within group work. Thus, we would advocate that students are made aware of the potential difficulties of group work at the outset and are encouraged to seek help from their tutors in the cases of exclusion and non-contribution and over-contribution. We suggest that educators are similarly cognisant and watchful and prepare strategies for intervention where issues arise.

Graduate recruiters may benefit from recognising that assessment grades for modules involving group work may not reflect ability or effort. Thus, students who have engaged in significant amounts of assessed group work, and who have been (for whatever reason) non-contributors may not possess knowledge and understanding, and skills commensurate with their grades both within modules and overall.

Further, despite having undertaken group work as part of their course of study students may not have developed any group working skills, or these may not be as developed as might be assumed. Further, students may also have had largely negative experiences of group work, whether that is related to the non-contribution of others or their own exclusion from the experience.

Finally, we suggest that the model advanced may be used by a wide range of stakeholders. For example, students and educators may find it useful as part of peer assessment, and personal development exercises. The business and management community may find it useful for examining and understanding variable contribution by individuals to teams, and for performance appraisal and management purposes.

7. Limitations and future research

There are a number of limitations to the present study:

First, due to the case-based nature of this study the findings and implications may not be transferable to other higher education settings. Second, the study made use of a convenience sample, and so it is possible that the experiences and perceptions reported by participants may not be representative of those held by other students. Third, in some cases participants were being interviewed by their module leader and tutor, and it may be that this impacted their desire to be entirely truthful. However, the apparent frankness, and the content of the discussions with participants suggests to us that this was not the case.

While free-riding has been explored at length within the literature, there is a dearth of evidence related to what we have termed forced-riding. Thus, we suggest that this phenomenon is one that may be fruitfully explored. In particular, we expect that descriptive research that seeks to determine the extent to which forced-riding occurs within student groups would be advantageous. In addition, we believe that analytic work that seeks to further explain the causes of this phenomenon would also be beneficial.

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