Using group work for assessment – an academic's perspective

Nigel Francis[1*], Matthew Allen[2] and Jane Thomas[2]

[1] School of Biosciences, Cardiff University, Cardiff, CF10 3AX. U.K.
[2] Swansea Academy of Learning and Teaching, Swansea University, Swansea, SA2 8PP. U.K.

* Corresponding author: francisn10@cardiff.ac.uk

ORCID
Nigel Francis - 0000-0002-4706-4795

Abstract

Under the correct circumstances, group work can be a powerful learning opportunity for students, helping develop key transferrable skills expected of the modern graduate. However, group work needs to have a clear structure and expectation to prevent it from becoming a vehicle of acrimony and establishing a negative feeling towards group work among students. This review of the literature focuses on group work from the perspective of the academic setting the task. Good practice for setting up and managing group work is shared, common mistakes and student issues highlighted, and potential solutions and ways to generate individualised marks and methods to allow students to take ownership of the task suggested. The review is written from first-hand experience of setting and assessing group work tasks to help academics create a successful learning environment for their students.

Keywords

Group work, assessment, transferrable skills.

Introduction

Group work can be a powerful learning tool for students under the right conditions, and the key transferrable skills they develop during this teaching approach are essential for the modern graduate. Group work can be effective at producing high-quality work; indeed, Surowiecki (2004) stated that groups are often more intelligent than the smartest people in them. A by-product of this is that if only one mark is given to the entire group, these tend to be higher than marks awarded for individual assessments (Yorke and Knight 2006). The strengths of other group members can mask the weaknesses of students, and while this is not necessarily a bad thing in teaching students to work collaboratively, it is vital to be able to tease out the individual contributions of group members. Marks from this type of approach also tend to be much narrower in range, with less variability, especially if groups are randomly created, as the average ability of the groups tends to be similar. This can cause issues with external examiners if marks are uniformly high; one potential solution is to have a robust marking scheme so that the high marks are at least justifiable from the assessor's perspective (Gibbs 2009).

When asking students to work in groups, they are often being required to work in a team to carry out a research project, produce a report or presentation, or carry out some other form of assessment where each group member is expected to contribute to the final product, and then a final mark is awarded to the group. Unfortunately, whilst this approach can help reduce the marking burden for academic staff and may teach some key transferrable skills, such as the ability to work effectively in a team, there are many downsides that need to be mitigated against. Under less than ideal circumstances, group work can be a vehicle for animosity and acrimony amongst members, and poorly designed tasks may lead to negativity from students towards this teaching approach. From a staff perspective, a poor group work experience can lead to academics disregarding this approach as a teaching and learning tool.

The issue of fairness of single marks from the student perspective can be challenging to justify, especially when some students will dedicate much more time on task and may end up "carrying" those students that do not engage with the task, enabling these students to achieve a much higher mark than their contribution deserves. The perceived difficulty of generating a fair, individualised mark is probably one of the most common reasons academic staff use for not considering group work as an assessment tool; however, when set up correctly, the learning benefits far outweigh these challenges (Boud and Falchikov 2007; Falchikov 2005). For these reasons, the ability to generate a fair, individualised mark, which recognises individual contributions, is key to underpinning a good group work assessment.

For group work to be effective, the academic must provide clear expectations and structure; it is not simply a case of allocating students to groups and asking them to work

collaboratively without guidance. In fact, doing that will likely remove any of the potential benefits of group work (Gibbs 2009). Additionally, getting students to engage with the process of the task and recognise the learning benefits, rather than just seeing the generation of an end product, can significantly improve student satisfaction with these types of assessment. If this approach is used, then the learning objectives of the task should include these processes, and they should also be assessed. As with all things new, students need to be educated on how to work effectively in groups.

This guide is based mainly on personal experiences of using group work as a learning and assessment tool and the refinements that have been made over a period of years to produce a robust and authentic assessment.

What is group work?

Collaborative working, working in small groups, cooperative learning, peer learning, team learning, reciprocal learning, or group work are all terms that can be used to describe a group of students, most commonly between two and six students, that are formed together to discuss a topic or carry out a particular task. The key feature of group work is that it involves students learning together and from each other (Biggs and Tang 2007; Race 2015). Davis (1993) identified three types of groups commonly encountered in higher education: informal, formal, and study groups. Informal groups are *ad hoc* groupings of students in a class used to discuss a topic; turn-pair-share is an example of this type of grouping. Formal groups are established to complete a specific task, either within an individual teaching session or over several weeks. Study groups tend to be student-driven and usually last for the duration of a module or course, where students will work collaboratively to support each other. Different methods for allocating students to groups and some of the advantages and disadvantages are discussed later in this article.

Why is group work important?

Students probably learn more during group work than any other form of teaching during their higher education journey. Group work covers a number of delivery methods, including tutorials, workshops, seminars, laboratory practicals, and simple discussion in pairs/small groups in large-scale lectures. Furthermore, it would be naïve to think that students do not work collaboratively on assessments outside formal teaching settings. Indeed, they should be encouraged to because some of the most powerful learning comes from being able to teach peers. Therefore, as academics, we should be looking for ways to harness this approach for the benefit of our students.

Beyond the academic benefits, group work can teach students a wide range of important graduate skills that are in high demand in the modern workplace (QAA 2015), including:

- Ability to work collaboratively in teams – face-to-face and remotely
- Ability to listen to others and provide constructive feedback
- Creative thinking to build on existing ideas
- Conflict resolution to mediate disagreements
- Time and process management skills
- Reflective awareness

Many of these skills can only be developed experientially by participating in group work and cannot be acquired theoretically. Therefore, offering students opportunities to acquire these skills and develop themselves as individuals should be a central tenet of modern higher education. However, in a higher education environment that is historically steeped in instruction rather than facilitation of learning, group work opportunities may be limited (Gibbs 2009). Increasing these opportunities can be challenging and is probably best discussed and mapped at programme level to allow a progressive, systematic development of student competencies (Phil Race & Sally Brown, personal communication, 2019).

Benefits of group work

There are many benefits of teaching students to work well in a group and to focus on the actual processes that underpin successful group work (Beebe and Masterson 2015). Firstly, as previously noted, the quality of the end product is likely to be higher than individual submissions (Yorke and Knight 2006). Secondly, by teaching students to work effectively together, the group will have a greater sense of ownership over the process and the final assessment; this communal ownership can also help reduce dissatisfaction with the group assessments by encouraging collaboration. Once students see the clear benefits of working in a group, they become more receptive to this assessment approach. Peer learning has also long been recognised as a much more powerful tool for learning than academic instruction (Mazur 1996; Vygotsky 1978). Mazur (1996) champions peer learning, highlighting that students are better placed to explain complex problems to their peers as they have only recently learnt it themselves, so understand the challenges being faced by their peers. Additionally, during peer learning, students may feel more comfortable asking other students' questions rather than an academic.

There are clear employability benefits too, helping to prepare students to work in multi-disciplinary teams (Sridharan et al. 2019), to develop time and project management skills, conflict resolution and the ability to give and receive critical feedback positively and constructively; all of which help integrate students into future employment (Jaques 2000). All of these skills are highlighted as essential to the modern graduate entering the workforce by the QAA (2015). A non-exhaustive list of potential benefits includes:

1) Promotion of discussion, debating and questioning, skills.
2) Transferrable skills development – collaboration, teamwork, negotiation, listening, time management, and leadership
3) Development of working relationships with students outside normal friendship groups.
4) Active learning strategy, allowing students to learn by participation. Creative thinking skills can be enhanced through brainstorming and developing the ideas of others.
5) Brings students with different learning experiences together, can develop new learning strategies and foster life-long learning skills.
6) Increases the range and variety of assignments that can be undertaken.
7) Helps with student retention, especially in the 1st year, as can reduce social isolation.
8) Working in groups mimics the 'real world' working environment.

Challenges of group work

Just as with any teaching methodology, there are potential drawbacks during group work that academics need to be aware of and attempt to mitigate through careful planning, monitoring and support. Some of these potential issues that might be encountered include:

1) Students are often reluctant to work in groups and have a proportion of their marks in the hands of others.
2) Poor group dynamics, especially if one or more students do not contribute or feel marginalised or isolated by other group members.
3) Issues of how students with extenuating circumstances can make up group work.
4) Cultural issues: Some students may not have experience working in groups and therefore need extra support and guidance.
5) Students may focus too narrowly on their individual contributions to the detriment of the group outcome.
6) Group work can be hard to assess, and individual student contributions are challenging to tease out, especially if conducted outside formal teaching hours.
7) The task might not be appropriate for group work.
8) The likelihood of these issues arising can be mediated by careful planning of the assessment or task, group selection strategies and effective monitoring of groups.

Freeloading

Freeloading or freeriding can be a common scenario if group work is not carefully managed and is one of the primary sources of student dissatisfaction with group work (Macfarlane 2016; Noonan 2013). It should be noted that not all cases of freeloading are necessarily the fault of the student that is purportedly not engaging. Sometimes group dynamics can subtly lead to a student becoming isolated and feeling unable to contribute fully (Noonan 2013), or

there may be special educational needs that make working in groups particularly challenging. Social loafing is a phenomenon where individuals working within a group are prone to exert less effort than if they were working as individuals, as others within the group may "pick up the slack". Several strategies can be discussed with students to minimise the likelihood of freeloading and social loafing, including:

1) Group rules/contracts of contribution to specific tasks.
2) Rewarding individual contributions linked to the group and task goals.
3) Penalties for inadequate participation – student or academic judgement.
4) Review of individual contributions through a diary, meeting log or reflective blog.
5) Peer assessment of contribution.

The most appropriate approach or combination of approaches will depend on the specific task being carried out, but it is clear that students will appreciate efforts to minimise any occurrences of freeloading. Ideally, groups should be able to self-regulate and attempt to resolve these issues, but it may be necessary for academic intervention in extreme cases.

Role of the lecturer

The lecturer plays a critical role in the success of group work, but their role is not that of an instructor rather a facilitator. The role of the facilitator is to ensure the smooth running of the group work process, but not to domineer groups. When setting up group work, the academic needs to ensure that the objectives and assessment are clear and linked to the learning outcomes. Potential roles during the group work include that of monitoring the group dynamics, either in class or remotely, being a mediator if group dynamics break down (Freeman and Greenacre 2011); although self-regulation of the groups by members is preferable, a coach/mentor approach to help students understand how to work well within a group to maximise learning opportunities and, in assessed work, that of an allocator or moderator of marks to ensure that students feel the assessment is fair.

Setting it up

Before you start

Why group work? This is the first question that you should be answering when you design an assessment that you think will lend itself to group work (Race 2015). The learning benefits of group work are numerous, but the challenges associated with setting up and managing this approach do not make it an easier option. In fact, it is often easier for the students and the academic to work individually. This is not to say that group work should not be used as an assessment tool, just that the reasoning behind this approach should be well thought out. One compelling argument for group work is that it is authentic, graduates will more than likely end up working in a job where collaborative effort is the norm, so they need practise at doing this. The key transferrable skills that group work can teach can be used to justify this approach, but how are you going to assess whether students are gaining

and using these skills, such as time management, problem-solving, delegation and self-regulation that are deemed essential for the modern graduate (QAA 2015)? Peer learning is another powerful argument. Giving and receiving constructive feedback is a crucial skill for the modern graduate to master. Group work can offer plenty of opportunities for this to occur. Finally, research demonstrates that well-constructed groups provide the opportunity for greater knowledge retention and a deeper understanding of the topic (Boud et al. 1999; Mills and Cottell 1998). Some potential scenarios where group work might be an appropriate learning tool include:

1) If course/module goals are best achieved through students working in groups, for example, if collaborative learning, cooperative learning, or teamwork is a course/module outcome.
2) When the task can only be carried out by a group, for example, if the task is too large or complex for individuals to accomplish or if different roles need to be assigned to students to mimic “real world” project working.
3) When students are required to think creatively and acquire listening skills to develop and build on the ideas of others.
4) More pragmatically if resources and/or time constraints dictate.

Whatever the rationale for choosing group work, some considerations need to be taken into account during the planning stage to ensure a successful outcome for both academics and students. Firstly, group work and the course objectives must clearly benefit the students in achieving the appropriate outcome for the assessment or task (Biggs n.d.), most importantly ensuring that students have ample opportunity to discuss and reflect on the task before submitting an assignment. Group work must assist students in learning the essential transferrable skills associated with this teaching approach, including planning, negotiation and communication. The students must be engaged with deep learning, which can be facilitated by creating a positive and exciting learning experience. Secondly, when considering the development of the task or assessment, academics need to ensure that they are designed so that all students have the opportunity to contribute equally, maximising individual contributions. The groups should be able to focus on specific outcomes that are closely linked to the learning objectives and the assessment strategies. Finally, and perhaps the most challenging aspect is to ensure that the task is fair and equitable compared to tasks that students could realistically be asked to complete as individuals. Some tasks that lend themselves well to group work include:

1) Complex problem analysis
2) Problem-solving, where there are multiple different lines of enquiry
3) Scientific experimental design and analysis
4) Event organisation
5) Surveys

With the current trend of rising student numbers in higher education, the importance of well-designed group work tasks and assessment is likely to take on greater importance in the future. From a purely pragmatic viewpoint, group work allows staff to assess student competencies whilst maintaining a manageable assessment load.

Group Size considerations

A number of choices exist when deciding on group sizes; sometimes, these are driven by class size, sometimes by the facilities available and sometimes by the nature of the work being carried out (Race 2015). When deciding on group size, one important aspect is how appropriate credit can be awarded for individual contributions to the end product. One strategy is to ask students to become the expert in a particular element of the group task, and therefore group sizes can be determined by the number of individually assessable components.

Although Surgenor (2010) states that no defined number characterises small group teaching, with increasing group size comes increasingly complex dynamics (Mills and Alexander 2013). Having said that, the size of the group can play a critical role in the success and effectiveness of group work (Davies 2009). Different group sizes offer various advantages and disadvantages (Table 1).

Table 1: Pros and cons of different group sizes during group work. Compiled from Davies (2009) and Race (2015).

Group Size	Pros	Cons
Two	• Easy to form pairs, can be used in large lecture theatres to spark discussion. • Very low probability of passenger behaviour and easy for groups to arrange to meet outside scheduled teaching class time. • Weaker students can be supported by stronger students	• Pairs can fall out, making future collaboration problematic. • One student may be absent, lazy or domineering. • Often good to rotate pairs, so individuals not always working with same person
Three	• Communication between three people still easy, workload can be shared. • Low likelihood of passenger behaviour, easy to arrange meetings. Casting vote option (true of all unequal number groups).	• Possibility that two of the three will work better together – marginalisation. • Two students can gang up on third, especially if not contributing equally or absent from meetings

Four	• Still relatively small group, allowing effective communication • Subdivision of tasks – two groups of two • Opportunities for delegation and collaboration • Range of skills, qualities and abilities	• Tendency to split into two pairs • One pair can be dominant • Possibility of passenger behaviour • No casting vote (true of all equal number groups)
Five	• Shares many advantages of fours, added benefit of casting vote. • Range or perspectives • Ability to sub-divide topic/tasks • Group roles start to become important	• Easier for passenger behaviour to occur (Ringelmann Effect) • Individual contribution starts to become harder to monitor • Reduced individual contributions • Less confident members can be dominated
Six	• Group can be subdivided multiple ways • Subdivision of tasks • Group leadership developed	• Passenger behaviour significantly increased
Seven +	• Only appropriate for very large tasks • Can enhance leadership and group role development	• Much harder to ensure equal participation • Considerable risk or passenger behaviour • Shy members may not be able to contribute • Skilful facilitation required

Ways to allocate students to groups

There are a range of ways to allocate students to groups, and each has advantages and disadvantages, which are set out below (Huxham and Land 2000; Race 2015). This is not an exhaustive list, and other methods for dividing students can be used. However, it is important to note that the way a group is formed can impact the success of the task (Chang and Brickman 2018). Therefore, pedagogical considerations relating to the task and the size of groups need to be considered when allocating students to groups to ensure a successful outcome and an effective learning experience for the participants.

Non-Random

Self-selection

Friendship groups have the advantage of each member knowing one another, and therefore groups tend to start working better from the outset. However, high achieving students are

likely to group together, followed by middle achieving students, leaving the weaker students to form groups by default (Mellor 2012). This can lead to some spectacular pieces of work from groups, but it can also leave those not selected feeling marginalised and demotivated to participate in the task (Sweet and Michaelson 2002). This is a helpful approach if you need to ensure a wide spread of marks; however, it removes many of the peer-support benefits associated with mixed ability groups (Race 2015).

Location selection

One of the easiest and quickest ways to allocate groups is based on location, for example, position in room or geographical area for online courses. While this approach is likely to include friendship groups, it can reduce the anxiety of students not being selected. Group ability can be skewed, especially if higher-achieving students cluster together in the class or weaker students hide at the back, hoping to avoid participation (Race 2015).

Alphabetical selection

Surname is an obvious first option but can also group by forename, last letter of surname etc., to mix groups up. In large groups, one potential disadvantage of grouping by surname is that students from similar cultural backgrounds may have similar surnames, reducing group diversity. Combining alphabetical with another grouping approach can help overcome this issue (Race 2015) (see hybrid approaches below).

Academic selection

If class size permits and the academic has a good knowledge of the individuals in the class, then the academic can group students to balance the overall ability of each group with a mix of higher and lower ability students. This can lead to very diverse and skill rich groups (Roberts and McInnerney 2007) but also requires careful planning by the academic to ensure a positive outcome for all groups (Mantzoris and Kehrwald 2014).

Skill-based selection

Probably more appropriate for extended projects, where a range of different skills and perspectives are likely to be required to successfully complete the assessment. Student skills can be determined through self-rating via in-class or online questionnaires covering a range of skills and then allocating students based on the feedback to the questionnaire. This approach can be very time consuming, and some students may under or overestimate their ability (Blowers 2003).

Random

The advantage of these approaches is that it is relatively easy to implement. Importantly, this approach also mimics the real world, where graduates do not often get to select who they work with. However, there can be drawbacks, such as group dynamics and the group taking longer to get started on the task as they learn about each other. Additionally, this

approach is not always popular with students who prefer self- or academic selection (Chapman et al. 2006; Hassanien 2006; Race 2015).

Number groups

Students can be arranged by student identifier number; class lists can be annotated with numeric values to allow division into multiple different groups, or a random number generator can be used to allocate students.

Other approaches

If class size, time or resources permit, students can be given a different colour post-it note as they enter the class or a playing card, which works well with larger groups. To stop students trying to game the system and swap post-its or cards with others, random groups can be generated, for example, each group has to have each colour post-it, or rather than allocating by suit, groups can be divided by number on the card. There are numerous ways to mix these approaches up to try and generate random groups.

Hybrid approaches

One or more of the above approaches can be combined to create random groups. For example, students could be ranked by student number and then divided into groups using an alphabetical or numerical approach; whilst this approach can create truly random groups, there is still a risk of inequality in group ability due to pure chance. Group members can also be asked to rotate around groups to share ideas between groups, and greater learning occurs. For example, you could ask group members to number themselves and then ask each number 1 member to move one group clockwise or each number 3 member to move two groups anti-clockwise.

There is no right or wrong way to allocate students to groups but being aware of some of the advantages and disadvantages of each approach can help ensure a successful outcome to the group task. There is evidence to suggest that students prefer self-selection, but there appears to be little difference in attitudes between self-selected and tutor assigned groups (Hassanien 2006). Perhaps more importantly, across the duration of the course, different methods can be employed to ensure that students get experience working with different individuals with varying group dynamics.

When deciding on group sizes and methods of allocating students to these groups, inclusive learning should also be considered, ensuring that the diversity of students is respected, all students are able to participate and fulfil their potential, and potential barriers to learning are removed. In that respect, teaching students to work effectively in groups is just as important as deciding on the task and assessment.

Teaching students to work effectively in groups

To get students to work effectively in a group, they need to be provided with a framework and taught how to behave within that framework. This framework will vary depending on the nature of the project, whether the group work is carried out in class or in the students' own time, so it is not possible to have a one-size-fits-all approach. This is an important consideration because students may not have the skills to work effectively with a group before starting the project (Shimazoe and Aldrich 2010). What does not work is the Nike approach of "Just Do It" expecting students to work in a group with no guidelines is a recipe for disaster and will remove many of the benefits of collaborative group work. Students may be in the group, but they are unlikely to be working together efficiently, and therefore they will not be gaining any of the key skills that group work can provide. When introducing the group task, it is also important to introduce students to effective group management techniques, but the students must feel like they have ownership of the group rather than conforming to rules enforced by the academic.

For this reason, one strategy that can be used is to get the individual groups to develop a set of guidelines that each member of the group agrees to abide by. These guidelines can cover aspects of the process as well as the product, ranging from expected contribution and consequences for non-compliance (self-regulating groups) (Pokorny and Warren 2016). Whatley (2009) showed that groups that agreed on ground rules prior to commencing the project had greater cohesion and satisfaction with the task. There should be discussions around how to organise the group (roles), how to effectively communicate and critique the contribution of others in a constructive manner and come up with a plan to develop the final product. The success of these guidelines can be assessed if needed through self-reflective diaries or peer assessment of group members (Forrest 2008).

It is also vital to allow groups sufficient time to develop, and consideration of Tuckman's (1965) explanation of group stages highlights this:

1) Forming – group comes together and gets to know each member.
2) Storming – roles start to develop, leadership is contested, and group dynamics start to be tested.
3) Norming – group consensus reached as to optimal operation.
4) Performing – group becomes effective and more likely to self-manage, working towards the task outcomes.

The role of the facilitator is most important during the first two stages to foster effective group formation and accelerate the group towards a functioning unit. Once the group reaches the norming and performing stages, they start to self-regulate, and it is rarer for the academic to have to intervene at this stage unless issues that cannot be resolved internally arise, such as a group member falling ill or failing to attend. In this case, the academic

should facilitate the situation to review and potentially revise group objectives or help the group come up with alternative ways to manage the task.

Table 2: Role of the lecturer at different stages of the group work process.

Stage	Strategy
Before	Outline assignment expectations. Explain the assessment processes. Facilitate group formation: - Allocation of roles. - Communication strategies. - Conflict resolution.
During	Encourage groups to: - Set goals and allocate tasks. - Review progress. - Support resolution of issues if required. - Identify issues early to ensure positive learning outcomes. - Reflect on process, not just product.
After	Help students reflect on the experience and highlight strengths and weaknesses. Provide timely, meaningful feedback.

Icebreaker activities

This can be a particularly useful starting point if groups are being allocated by the academic or randomly where group members may not know each other, as they offer an easy way to get students interacting quickly with one another (Race 2015).

1) Introducing yourself to the group. As simple as this might sound, just identifying yourself to the group by your preferred name and by telling them something about yourself can help create a team bond.
2) What do you know about the topic already, can be done orally, using post-it notes or on a flip chart? Can help groups establish ownership of their topic and helps facilitators identify what is already known within the groups.
3) Interview your neighbour – only works in groups with equal numbers. Students split off into pairs and try to find out as much as they can about their partner in 1 minute, then the interviewer feeds back to the group before roles are reversed. As with (1), this approach gets students acquainted with each other but also works on listening and questioning skills.

Potential in-class group activities

Peer learning within a classroom environment can be an effective way to facilitate deeper learning, with research suggesting that students learn better when actively engaged in the process (Ellis and Goodyear 2010; Laurillard 2012). Group work can be a valuable tool to reinforce student learning or highlight common misconceptions, engage peer learning, and

foster debate. An additional benefit is that students who might be reluctant to speak in front of an entire class may contribute to smaller peer groups. The type and nature of the group work will depend on the subject area, student numbers, room layout and the time available to devote to peer learning. However, even within large, tiered lecture theatres, students can be encouraged to work in small groups, for example working in pairs to produce a minute paper to summarise a lecture, responding to a clicker question and then debating the answer with a fellow student who gave a different answer to reach a consensus answer or to discuss and evaluate the key points of a case study.
In more formal group work settings, some of the following techniques may be employed (adapted from Race, 2015).

Rounds

If group size permits, then at the start and end of a session, each member of the class can be asked to respond to a question or to summarise what they have learnt in a session. An alternative is to ask students to write their responses on a post-it note and stick these on a wall for review.

Focus groups

Small timed tasks in small groups to encourage them to talk to one another. Outcomes can be shared on a flip chart or audience response system. Encourages learning by explaining and feedback. Works well if different groups are discussing several different topics to allow feedback to the whole class and promote debate.

Pyramiding

Starts as a simple individual task, then in pairs on a slightly more complicated task and finally as a larger group to complete a complex task, perhaps aligned to the upper levels of Bloom's Taxonomy (Bloom, 1956). Feedback to the whole group can be carried out if required. As with focus groups, this feedback works well if several related and overlapping topics are being discussed.

Crossover groups

Encouraging students to work outside their friendship groups and share ideas between groups is a benefit of group work. If there are an equal number of groups to group members, then a simple rotation system can be carried out with members moving one place further around the groups than a previous group member. Race (2015) also illustrates a method using stickers with a Greek letter, a normal letter, and a number; students can then be asked to find other members of the cohort with a matching letter or number, allowing multiple different groups to be formed. A similar outcome can be achieved using playing cards to group by suite, value or colour. This approach is beneficial for encouraging participation and sharing ideas, allowing for several different perspectives on a problem.

Brainstorming and word clouds

A valuable approach for stimulating creative thinking and generating creatively different solutions to a problem. The collective mass of ideas can then be shared, and as a group, these suggestions can be discussed and ranked in order of preference or importance. Anonymous, private voting using an audience response system can be beneficial here to encourage students to participate and prevent responses from being influenced by peers. The results of the vote can be shared to foster further debate.

Pairs dialogues

This can be useful to allow students to clarify their understanding of a topic by explaining their views to a partner. Taking it in turns to speak without interruption enables students to form their ideas and identify gaps in their knowledge. The skill of listening to an alternative viewpoint can also be practised, which can be a key skill in many graduate jobs.

Tasks that lend themselves to group work

A well-designed group task is one that cannot be accomplished by individuals, allows all group members to make a meaningful contribution and accommodates a range of learning strategies and skills. Some tasks that lend themselves well to group work include:

1) Designing and implementing a scientific experiment and analysing data collected.
2) Organising an event.
3) Analysis of a complex topic or situation.
4) New product or novel solution to an existing problem design.
5) Problem-solving where there are several different avenues of enquiry.
6) Group poster or oral presentation.

Whatever task is chosen, clear, fair, and transparent marking guidelines that link to the learning objectives are essential.

Ways to manage group dynamics

As the academic in charge of a group work activity, your role becomes much more of a facilitator, observing group dynamics and interactions and only becoming involved if things are clearly not functioning. One easy exercise to help groups guide their behaviours, particularly for longer running tasks, is to ask groups to generate a set of ground rules that all members agree to abide by (Whatley 2009). This can be pretty challenging once students move past the obvious "everyone contributes equally" or "turn up on time" behaviours, so it is a good idea to provide a framework of potential issues that students can discuss together. This could just be a document with a set of questions that students need to discuss, for example:

1) What measures can the group put in place to ensure everyone contributes to the task?
2) How will you ensure that everyone has an opportunity to voice their point of view?
3) What makes constructive and positive feedback?
4) How will the group manage any conflict or disagreements among members?

Providing scaffolding for students to base their group rules around will help facilitate discussion without making them feel that the rules are being imposed on them by the academic, thus helping create a sense of group ownership. Research shows a positive correlation between the ability to self-regulate learning within a group and performance (Brown and Harris 2013; Panadero et al. 2017).

When carrying out group work, there is always a risk that some students will try to dominate the group and take over, whilst other students may look to ride on the backs of their harder-working peers. During class-based group work, the facilitator can monitor and, if necessary, intervene; however, a better alternative is to either allocate roles within the groups or allow the groups themselves to define appropriate roles for members. One strategy that can work well is the group-expert approach, where individuals in the group are allocated a specific part of the task and are expected to become an 'expert' in that area to feedback to the whole group. This can be particularly effective where the groups are expected to produce a final submission; when coupled with other strategies, it can provide a clear overview of the students' engagement with the task.

The academic has a key role during group work, whether synchronous or asynchronous, in that they need an overview of the general class dynamic as well as insight into how each group is working. This can be easily achieved during synchronous tasks by circulating the room, listening to discussions, and providing insight or guidance where required. However, it is important to resist the temptation to intervene too early and allow groups the opportunity to explore the task.

Edward de Bono proposed the idea of ‘Thinking Hats’, which is widely used in business and government (De Bono 1999) can be a useful starting point, especially if a range of viewpoints are required. The ‘thinking hats’ approach can encourage students to widen their perspectives. The six coloured hats are represented as:

1) White – neutral and objective, concerned with facts and figures.
2) Red – the emotional view, instinctive and intuitive.
3) Black – careful and cautious, the ‘devil’s advocate’ hat offering a logical approach.
4) Yellow – sunny and positive, identifying the reasons for optimism.
5) Green – associated with creativity, lateral thinking and new ideas.
6) Blue – cool and calm, the manager of the thinking process.

Using this approach can help generate group discussion; either the students approach the task 'wearing' one hat throughout to foster debate or rotate the hats and think about the problem from different perspectives (De Bono 1999).

Monitoring asynchronous tasks is more challenging, but the use of diaries, blogs or wikis can help track engagement allowing the academic to gain some feel for the dynamics and workings of the group. However, providing strategies to enable student groups to self-regulate is much more powerful and teaches students key transferrable skills for their later careers. The group ground rules play a key component in this process, providing a framework of behaviours that are expected of members. Whilst, in an ideal world, groups would be able to resolve all issues, on occasions it may be necessary for academic intervention, Lejk, Wyvill and Farrow (1996) proposed a yellow and red card system, whereby group members were able to request a yellow card for a non-participating member. The academic can then review the contribution of the named student, arrange to meet with that student to ascertain any mitigating reasons for being unable to participate and if upheld, issue a yellow card as a warning to the student. If a student is given a yellow card, then they are in danger of losing a percentage of their marks for the task; however, if the student makes a fair contribution to the task, then the card can be rescinded to allow full marks to be achieved. If the group reports no change in performance, a red card can be issued, following academic investigation, resulting in the non-participating group member being removed from the group and receiving a mark of zero. This has the effect of not disadvantaging the remaining group members in the final task as the group and academic can discuss ways to overcome the loss of a group member.

Assessing group work

One of the first challenges is to decide whether the students are going to be assessed on the final product, the group work process or a combination of both (Dijkstra et al. 2016; Kennedy 2005). Ideally, this should have been outlined during the development phase of the group work design to ensure clear and transparent learning objectives (Biggs n.d.). The second challenge is how to make the assessment and subsequent allocation of marks fair as the assessment often becomes the focus for students (Ramsden 2003). The key questions the students will home in on are what will be assessed, when and how will it be evaluated, and who will be assessing it. Having clarity about these questions can go a long way to alleviating a number of the potential pitfalls of group work. There are many ways to assess aspects of group work, including shared marks, individual marks for designated tasks, and combinations of shared, individual and process marks or individual assessments based on the group task, each of which has advantages and disadvantages.

The fundamental underlying principle that should inform all assessments, not just group work, is that the marks awarded for the assessment should be allocated in a way that

consistently rewards students achieving the learning objectives. There are several approaches to allocating marks to students, which each have pros and cons. One option, which probably most closely reflects the real world, is that one mark is given to all group members; however, this can create issues of fairness within the group where students may resent sharing marks with students they perceive to have contributed less time on task. Alternatively, individual marks can be allocated to each member, but there then raises the issue of how to accurately assess contribution. Finally, students may work collaboratively on a task but then be evaluated on an individual piece of work related to that task. This then raises the question of who is best placed to mark the assessment, the academic, the students or a combination of the two?

Academic assessment of contribution

In group work, it can often be difficult to identify the specific contributions of individuals in the group, and this is particularly true if the task is carried out asynchronously. The academics' assessment of student contribution is essential but challenging. If all the work is carried out in class and numbers permit, then the academic can gauge engagement and contribution from careful observation of the group dynamics and interactions between group members. It may, in this scenario, be possible for the academic to allocate an individualised mark based on these observations as well as from judging the quality of the final product if students have been assigned a specific topic or section to complete.

If work is carried out asynchronously, then this can become more challenging to monitor, in which case peer assessment of contribution may be a more appropriate strategy. There are, however, ways that the contributions can be recorded. Groups can be asked to keep minutes of meetings and submit these as a part of the assessment at regular intervals. This is particularly effective at monitoring student participation with the task and can be a means to try and assist or re-engage students that are not contributing. It is important to note here that non-participation does not necessarily mean that students are freeloading and therefore engaging in an open dialogue with disengaged students is essential.

The group is likely to have helped each other complete the assessment and produce the final product and indeed should be encouraged to do so as this is likely to be one of the task requirements. Depending on the nature of the assessed work, it can be relatively easy to distinguish those students who have a deep understanding of the topic and are more likely to have devoted more time on task than those who are more reliant on others. This is particularly true for oral or poster presentations. However, suppose the final product is more integrated, such as a written report. In that case, the academic's judgement of contribution may not be appropriate, and peer assessment may offer a fairer overview of contribution. The academic can restrict their marking to the quality of the product rather than the process. Alternatively, students can be asked to generate the written report as a wiki so that the individual contributions can be tracked by the academic, and this can be

used in conjunction with peer assessment of contribution to come up with a final mark (Judd et al. 2010). One way to ensure that students do contribute is to award one mark for the individual contributions and a second mark for the quality of the submitted work. This can help balance the need to perform effectively as individuals to generate a high quality, consensus output. Regardless of the methods used, having robust and transparent assessment criteria documentation is essential (Dennick and Exley 1998).

Peer assessment of contribution

The students working within a group are often in the best position to assess the contributions within their group, and this can be harnessed through peer assessment of contribution (Hanrahan and Isaacs 2001). Using online tools such as WebPA allows members of the group to anonymously rate the other members and is a powerful tool to provide insight into the group dynamics whilst also encouraging students to reflect on the group work process as a whole (Gordon 2010). It can also be helpful to have two assessment points, one formative mid-way through the task and one summative at the end of the task, to provide feedback to group members on how they are perceived within the group. This allows members to alter behaviours that may be perceived as detrimental by other group members.

One strategy for using peer assessment is to ask the students to divide the total marks for a task between themselves; for example, if a group has five members and the group process is worth 40% of the task, then the students would have 200 marks to distribute between themselves. If this approach is used, then it is important to provide students with appropriate guidance and determine in advance the criteria for distributing marks, which can be linked back to the group ground rules.

Alternatively, the academic can create a series of defined criteria that the students use to rank each other on. This feedback can then be used to adjust the overall group mark, for example, as a multiplier for the mark determined by the academic for the group or as a standalone contribution mark that can be incorporated into the final mark. As with peer distributed marks, it is vital that the criteria that students will be judged on are transparent and made clear from the outset (Lejk and Wyvill 2001). One caveat on using group mark distribution is that it can encourage some students to take over the project as they feel they will receive a greater reward. This can be addressed during discussions on how marks will be distributed to recognise contribution rather than volume of work.

There are, of course, disadvantages with peer assessment, including potential bias either for or against other group members. Again, clear guidelines from the outset can help mitigate against this, but it may not be possible to completely remove, so academics may need to moderate peer-assessed marks for fairness (Nicol and MacFarlane-Dick 2006).

Self-reflection

Depending on the learning outcomes of the group work task, it can be beneficial to assess not just the group's output but also the learning of the individuals within the group via a reflective self-evaluation as proposed by (Lejk and Wyvill 2001). This can be achieved by requiring the students to write a blog or submit a short written, reflective piece highlighting one skill they think they did well, one that needs improvement, and something they need to start going next time they work in a group. If this reflection is submitted before any academic feedback on the group work, it encourages students to reflect honestly on their performance and learning. Cripps (2015) highlighted the correlation between student feedback and comments received from academics when this approach is adopted, suggesting that students already know where their strengths and weaknesses lie, so academic feedback can become more dialogic to encourage future learning (Winstone and Carless 2019).

Collaboration vs. Collusion

The issue of collaboration and collusion is one that should be addressed with students if they are required to work as a group but produce a final, individual assignment. Academic integrity is a cornerstone of Higher Education, but it can be difficult for students to understand the differences when being asked to work in groups. Collusion within group work can be difficult to define. Still, it needs to be highlighted to students from the outset that although cooperation is expected and should be actively encouraged, as this is one of the main benefits of group work, collusion is unacceptable. Clear guidelines should then be provided as to what is acceptable and unacceptable behaviour, specific to the individual task (Sutherland-Smith 2013).

Inclusivity and reasonable adjustments

There may be occasions when reasonable adjustments need to be made for students undertaking group work assignments. It is important that the academic is aware of these instances and attempts to find ways to ensure that the student can take a full part in the group activities. For example, deaf, hard of hearing, or visually impaired students may find it challenging to engage with other group members and may miss visual or verbal cues. Students with specific learning difficulties may need extra time to complete assessments, whilst those with mental health or autism spectrum disorders may need additional support to learn how to interact appropriately with a group.

Once an academic becomes aware of these potential issues, extra support should be offered to groups to fully integrate all members and try to ensure a successful outcome and enjoyable learning experience for all students involved. Whilst it is not possible to predict every eventuality, academics should have at least considered some of the more frequently encountered inclusivity issues and considered alternative methods of mitigating the effects of these.

Dealing with deferrals and re-assessment

One final challenge associated with group work that most academics probably do not consider from the outset is what they will do in the case of students with extenuating circumstances, deferments or who fail the module. This consideration is both for the affected student and the other members of the group, as it is imperative that procedures can be put in place to ensure that remaining group members are not disadvantaged and the affected student has an opportunity to be (re)assessed.

If the group work assignment involves an individual contribution, this is easier to facilitate; however, if the end product is a collaborative effort and/or the process is also being assessed, then the deferred/reassessed work needs careful planning as any replacement work will need to allow the student to demonstrate the required learning outcomes. If more than one student requires (re)assessment, they can be placed together or contributions prior to deferment or engagement during the original task can be considered during redemption. Alternatively, if none of these are available, the student may be able to interact with a different member of staff in place of a peer.

Summary

The benefits of group work are wide and varied, however, utilising this teaching tool is not without its challenges. Careful planning at the outset is required to create an authentic assessment that provides the right learning opportunities for students and avoids acrimony. Group work is a challenging teaching methodology, but to build trust and collaboration between students, it is essential to give them opportunities to practice. Despite its challenges, group work, if set up correctly, offers students many learning opportunities and exposure to different viewpoints that cannot be replicated during individual assignments. There is no absolute right or wrong way to set up a group task, and much will depend on the nature of the task, the level of the students involved and the learning outcomes that need to be assessed. The ideas contained here can help avoid, or at least minimise, some of the potential issues surrounding group work and provide the students with a highly engaging, authentic, and enjoyable learning experience.

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