

SIZING THE SLICE: ASSESSING INDIVIDUAL PERFORMANCE IN GROUP PROJECTS

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Introduction

This study describes a method of assessing group work that produces individual grades. It is unusual in that the assessment of individuals is based not only on the quality of the group work produced, but also on the extent of that individual's contribution to the group. The other team members assess the scale of that contribution; consequently, self-awareness and reflection on individual contribution and participation in team working are built in. Academics can mark the group's work with some confidence that individual efforts can be suitably rewarded.

Background

Students and academics sometimes mistrust group projects. Students are wary of totally committing their energies to a piece of work if they think that credit for it will be shared with other, less deserving colleagues. Equally unfortunate for the group members, some anxious individuals may feel that they have to dictate or drive a group to get the result they want - the steamroller approach. Conversely, academics rarely feel certain that when they assess a group project they are appropriately rewarding individual team members. They are concerned that some contributions will be undervalued and others over-rewarded. There can be other difficulties. Organisational logistics can sometimes be burdensome for academics, particularly if the project runs for any great length of time or involves different student groups. Some self-selecting groups can work against the aims of multi-disciplinarity; difficulties can arise from working with people who do not share your views.

Yet group projects - particularly with multi-disciplinary teams - have a great deal to offer. This is particularly true for courses in design and the built environment, where creative ideas have to be presented, accepted and adopted before they can be fully implemented, or where successful implementation demands the input of - and translation to and from - several other disciplines. For example, in much architectural education, the emphasis is on the quality of an individual's creative efforts. Yet in architectural practice, the emphasis is on the successful development and implementation of ideas by groups, including teams from different disciplines. This assessment method goes some way to reconciling those different views.

The students who have worked on the projects in this case study have been:-

- Full and part-time level two students following BA honours degrees in architecture and landscape architecture
- Full time level one students on a multi-disciplinary arts and design BA, with individuals working in the fields of spatial, artefact, media and product design.

All these professions rely on the successful development and implementation of creative ideas by, or with, larger teams.

The Assessment Method

The study reports on an assessment method that has been used for the past five years. It has been applied to a group project, one aspect of which asks students to consider their own team's functioning and their own individual contribution to their group's efforts. While the assessment method sits particularly well in a project that asks students to consider how groups work, it is also potentially useful as a generic tool with group work.

In this particular project two items of work are assessed:

- the presentation of the team's findings and
- a single written team report covering the same subject matter.

The final assessment combines the grades from both the presentation and the report.

Although it is not essential to the assessment method, the report is tutor marked. We have, over the years, also experimented with involving students from the audience in assessing the presentations. This was done with the primary aim of encouraging student interest and participation in the presentations. However, we found student interest to be consistently high, even without this carrot, and student marking was close to that done by the tutors. It remains a possible add-on for anyone wishing to use the assessment method.

1. The Group Assessment

The subject of this case study is a way that a grade allocated by a tutor to a group can be translated into grades for individual students, recognising their contributions. In this case, that translation is done by the group members themselves. During this study we'll use a simple analogy: while tutors decide the size of the group's "pie", the group itself decides the size of each member's individual "slice".

To understand the method, let's look at an example using work from Groups A, B and C.

The first part of the assessment takes place at the end of the project, just *before* any assessed work is submitted or presented. Each group fills in a pre-prepared blank Mark Allocation Form which describes how marks are to be

allocated amongst group members. We think it is important to establish this before any work is submitted.

The Mark Allocation Form is divided into three columns. Column 1 is legibly filled in with the full names of the active group members. Column 2 contains the percentage of the group's mark the group think each member should receive. This column should add up to 100% (if it doesn't the group's made an error.) Column 3 contains the signature of each group member, confirming both their participation and their agreement to how the group's pie is to be sliced. Groups are told that total non-attendees are to be given 0%: otherwise the distribution of the 100% is down to the group.

Once these sheets have been submitted, along with the tutor's copy of the report, presentations begin. Later the reports are assessed and a total group mark is given as a percentage.

Let's look at three groups as a sample. Their work was marked as follows:-

- Group A:- 80% an excellent presentation and report
- Group B:- 60% better than average
- Group C:- 35% In this case the pass mark is 40%. This team's work does not pass

Normally, that would be that, but now we move on to consider the performance of individuals. This is where we start to do things differently, based on the information supplied by the group.

2. The Pie

Each of the three groups filled in the Mark Allocation Forms. These record that they want their marks allocated to individuals as follows.

GROUP A:

Bark	25%
Docherty	25%
Eagle	25%
Sanchez	25%

This group decided that all marks should be divided equally between them.

GROUP B:

Chandler	50%
Hammet	20%
London	30%
Traven	0%

Predictably, Traven has not attended throughout the project, so the group has followed our instructions and given him no marks. Chandler, on the other hand, seems to have carried the team.

GROUP C:

Burton	15%
Gardam	25%
Manning	10%
Pym	15%
Shreeve	0.5%
Tremain	30%

The group agreed that Tremain and Gardam did particularly well and rewarded them accordingly. Though she attended, Shreeve contributed little to the team's work and has accordingly been rewarded with a smaller share of the group's mark.

Before we work with these figures we should note some fundamentals.

- If, at the end of the project, a group decides that all members should be rewarded equally - that's fine. Individual marks are only an option. If the group wants marks shared equally between members we see it as a sign that everyone has worked well and that all contributions have been valued. Initial student interest in this marking regime has always been considerable, varying from anger, through puzzlement to amusement. Come the end of the project, however, we've found that the "equal shares for all" principle has held sway for at least a quarter of the groups.
- It does not affect the assessment method if the groups vary in size - either due to the initial set up or because people do not attend or arrive late. We have run the project with groups varying in size between 4 and 12 members. Indeed, we argue that this diversity reflects professional life, where David and Goliath practices compete together. It also greatly simplifies the logistics of administering the project.
- Groups are instructed that where there has been no attendance at all, the absentee should be given no share and is excluded from any future consideration. So Group B effectively has only 3 members. On the other hand, the group should allocate marks to members if they have made a contribution, albeit limited.
- The nature of the process can accommodate - indeed encourages - a wide range of grades. For instance, Group C has decided that Tremain will receive six times the marks received by Shreeve. In this way the group effectively sizes each individual's "slice".

But how do we work out the size of the pie? Let's assume that each team member brings with them a notional 100 marks. Then each team has a potential pool of marks, based on the number of students in the groups.

For example, Group A has 4 members and so it has a potential pool of 400 marks. By the same token, Group B (3 active members x 100) = 300; Group C (6 members x 100) has 600.

This group pool is reduced in line with the mark the group received. Hence:-

Group A	80% of 400 marks	=	320 marks
Group B	60% of 300	=	180 marks
Group C	35% of 600	=	210 marks

This determines the relative size of each group's "pie".

3. The Slice

The individual's "slice", taken from the Mark Allocation Form, is applied to this figure, to give individual percentages. Hence:-

Group A has 320 marks, divided as follows:

Bark	25% of 320	=	80%
Docherty	25% of 320	=	80%
Eagle	25% of 320	=	80%
Sanchez	25% of 320	=	80%

Group B's 180 marks are divided thus:

Chandler	50% of 180	=	90%
Hammet	20% of 180	=	36%
London	30% of 180	=	54%

Group C's 210 marks are divided thus:

Burton	15% of 210	=	32%
Gardam	25% of 210	=	53%
Manning	10% of 210	=	21%
Pym	15% of 210	=	32%
Shreeve	0.5% of 210	=	11%
Tremain	30% of 210	=	63%

Again, a few points should be noted.

- The group project can pass and yet a poorly performing individual – e.g. Hammet in Group B - can fail.
- Conversely, if the group's project fails, strong individuals can pass. So although Group C's overall grade was poor, two major contributors - Gardam and Tremain - pass.
- We should mention one anomaly. Readers who play around with the figures may find that – whilst unlikely – it is mathematically possible for an outstanding group member in a high-marked team to end up with more than 100%. This has happened only twice with over five hundred students in the past five years. We offer two ways of dealing with this: tutors can "cap" marks at 100%; or

alternatively, scale down all grades pro rata to keep all individuals within the 1-100 range.

It is nonetheless true that this assessment method can produce a much wider range of grades than seen in many design courses. Often such programmes have a culture or an academic framework that keeps grades within a fairly narrow band. We consider the range produced by this assessment method to be more useful.

Perceived Benefits

To students

- Feedback to the students on their performance within the team is direct, through ongoing work and debate.
- The students recognise that successful academic performance relies on successful group performance.
- A student who performs well need not be hindered by a poor group project and vice versa. Everyone knows that the scale of his or her contribution can be rewarded.
- The assessment method puts a premium on contribution, participation and the reconciliation of differences. Students know from the start that it will pay them to work hard, work together and to reconcile the different views and working styles within their group.
- We specifically ask that the report preparation, presentation and subsequent Q&A session should be group activities. Students are under peer pressure to participate in some way and not retreat to the sidelines. At the Q&A session we ask all members to come on stage – if only to take a bow.
- Another repercussion of the assessment method is that students start to recognise the worth of different types of contribution to the group's effort. Diplomacy, peacemaking, insight, even the ability to diffuse a group row through humour, can be recognised along with more conventional traits of hard work or organisational abilities. This reinforces the idea that everyone has an incentive to contribute and means that a wider range of contributions can be welcomed.
- The random selection of the teams breaks across usual student relationships: new friendships and relationships are built up with people the students would otherwise not know. This works at the obvious social level but it also works with students who often form groupings through similarities in professional, linguistic or cultural background: they find themselves mixed with others.
- Conversely, students acquire confidence from knowing that they can work creatively and constructively in a team without the other members being specially selected. Indeed, individuals come to

recognise that strong teams are made up of members who are varied, rather than ones who are “just like me.”.

To tutors

- Varying group size and the multidisciplinary makeup of the group are not problematic: instead they can produce a richness of both prior experience and response that is rewarding.
- This also makes the administration of the project easier.
- Increased student enthusiasm for the project and the teamwork gives greater job satisfaction.
- The assessment method can handle a wider range of students and a wider range of subject matter without demanding more input - avoiding tutor burnout.
- There was also evidence that the assessment method increased attendance and participation by several students normally regarded as “semi-detached” from their cohort. For these students it would seem that peer pressure can work better than letters from the university.
- Some students can be dispiriting to teach: all the tutor gets back is work that embodies a pale imitation of what tutors said at the last crit or tutorial. This project sidesteps this: it minimises the temptation to leave the work to certain team members who are more motivated, knowledgeable, or worried.
- Using this assessment method student groups seem to feel more empowered. More active groups are better able to research, make contacts, and work through the themes or arguments of their work. That in turn means presentations and reports can often be surprising, rewarding, learning experiences for staff and students.

Support Requirements

There are no special requirements, beyond a spreadsheet, in which to enter the students' names and formulae, and photocopies of Mark Allocation Forms, which are filled in by the groups and collected at the end of the project just before assessment. We are however indebted to the technical and support staff who have provided workshop, AV and IT support to the students. Support to groups – e.g. the answering of group queries - is best done by emails, circulated to all groups. Tutors should avoid supporting individual students rather than teams.

The Barriers

Sometimes students miss part of the project - for example, due to field trips, illness or late arrival on the course. Our general policy has been to leave it up to the student to explain his or her absence and for their groups to respond as they see fit. Typically the response of groups has been to demand

considerable commitment and help from these “new arrivals” to establish their credibility with the group, but there have been occasions when group members have been unconvinced about the reason for the late arrival and the latecomer’s share of the group mark has been reduced accordingly.

During the life of the project there has never been a complaint about the marking of the groups’ work. What has surprised us is that during the past five years there have been only two informal complaints about the outcome of the assessment process for particular individuals. One student who had not attended any team meetings (or, apparently, any of the attached lectures) excused his lack of performance by saying his mobile phone did not work in the UK, so he never heard of the meetings until it was too late. His group colleagues were unconvinced about this and voted accordingly. Two others complained of a general dissatisfaction about the way they had both been rewarded compared to their fellow team members.

The line taken by staff in such disputes has been to sympathise, talk over the difficulties and then to quite readily agree to recalculate grades - providing a new marks allocation sheet is submitted, signed by all group members. This maintains the project’s idea of keeping academics out of the allocation process and leaving it to the groups to resolve. Despite – perhaps because of - this approach, nothing has ever transpired. However, silence or, more often, deference by individuals during group work can lead to irritation during and after the project. This can arise because of gender or cultural issues for example.

Therefore we strongly advise all groups that: -

- The group is only as good as the pool of information that is shared between members. Particular facts or snippets are of little or no value if only known to one or two individuals.
- They will function best when everyone is ‘on board’ and contributing fully.
- As an issue of good practice, they should regularly check on agreement, commitment and cohesion within the group.

The Enablers

Although the assessment system has worked well since the early days, certain developments have helped the groups perform better.

- Increasingly, the universal availability of email, the ubiquity of mobile phones and text messaging have meant that even distributed groups can perform well together. Excuses about not being able to participate in group discussions have diminished over the years.
- From the start, we have always imposed a tight time limit (currently 6 minutes) on the presentations. This demands that groups must decide what to leave out; what stays in must be

presented succinctly. Those decisions demand discussion and the short time slot demands rehearsal.

- Presentation software such as PowerPoint remains prevalent. Students recognise its combination of visual gloss with a format that can be easily translated into the group report. Once, PowerPoint skills were limited to individuals seen as 'techies': their presentations were anything but group reports. That restriction has vanished. Now such skills are almost universal, we are starting to see a backlash against them. Either the groups take another step, pushing their presentations to another, more sophisticated, level by adding sound tracks and animations, or the group realises that an altogether different form of presentation - for example role play - can become memorable by sticking out from the crowd.
- A reliance on information technology has other pitfalls. At presentations, some groups can be caught in time-consuming struggles to connect laptops to projectors. During such a debacle, with his group running out of time and an audience scenting blood, one group member stood up and presented without notes. Checking with the audience afterwards, it was agreed that this was the most powerful, informative and convincing part of the presentation. There were no visuals to detract from what he was saying and the absence of notes made the student sound authoritative and his message heart-felt.
- The other area of the presentation where groups can shine is in an obligatory question and answer session afterwards. Students generally recognise during rehearsals that dedicated "answerers" are counter-productive: the more interesting and instructive alternative is where everyone joins in and multi-faceted answers emerge during the course of discussion. We encourage questions not just about the content of the group work but also the techniques and working methods that produced it. Interesting questions also arise when students start to question one group's experience in comparison to their own. The results can be heated but are always fascinating.

Evidence Of Success

We should thank our students: they have whole-heartedly supported the project enthusiastically throughout the past five years. This has been evidenced by both formal feedback questionnaires and informal feedback.

It is worth repeating that this project has worked without any timetabled slot allocated to it. While students were given, in parallel, a short lecture on theories about group formation, no other teaching time was devoted to the project. There's only a half hour introduction and a half-day presentation slot at the end. This in turn has made demands on every group's research,

scheduling and decision-making processes. It's another factor forcing the group to function.

Despite all this, it works: students are committed to the project and - perhaps more important - to their peers.

How Others Can Reproduce This

We recommend making a clear announcement at the start of the project that the group will determine how grades are allocated to individuals.

This has usually been linked to a demonstration of how the assessment method might work in practice. Student response to the principle, and the example we give, has varied from enthusiasm through anxiety to anger, but there is always keen interest. Surprisingly, many of the wariest students who leave the introduction scribbling calculations are, by the end of the project, sharing marks equally across their group. We feel that introducing the assessment method has not been wasted in these cases: it has had the effect of making everyone perform.

In every case we have used this method, part of the project's subject matter has been for the group to consider how it has performed. We recommend keeping this element of self-reflection. It forces students to constantly think about and debate how their research, rehearsals, preparation and meetings are progressing. What gets assessed is what gets done. It also gives a more considered basis for decisions about how the group's mark is to be distributed.

The materials and equipment requirement to reproduce this are modest enough. What may be more difficult is the change in perceptions needed by both students and staff.

- It can take time, for example, for an individual student to get used to the idea of raising a query with fellow group members first, rather than asking a tutor direct.
- A student with a nugget of useful information may not initially realise it has little worth unless he or she can make their group colleagues understand and appreciate it.
- Conversely, it's certainly difficult for academics to back away from an interesting query raised by an involved and hardworking individual and say they will only deal with it as a query from the group.
- Nevertheless, academics should do all they can to maintain a level playing field between groups. They will find they are rewarded by seeing students recognise the wisdom of their teams.

We confirm that the names used are not those of students who took part in the project. The names, teams and grades quoted are purely for illustration of a principle and are not intended to indicate the actual performance of real teams or real students. If there is any similarity, it is unintended and accidental.