



**Faculty:** Engineering  
**Department:** Bio engineering  
**Module name:** Design and Professional Practice 2  
**Degree:** Biomedical Engineering and Molecular Bioengineering  
**Level:** Year 2 Undergraduate  
**Format:** Project based (team projects)  
**Approximate number of students:** 180  
**Weighting and credit:** 4 assessments at 25% each  
**Module ECTS:** 10

#### Insights colour key

Educational Developer

Inclusivity

Learning Designer

Registry

Careers

When choosing an assessment diet for the course it is important to consider the ECTS value. A 5 ECTS course requires 125 hours of effort. It is important to reflect whether the proposed number of assessments is appropriate for the amount of effort indicated by ECTS. This is especially the case with group work that in some cases requires more work than an individual assessment.

## Integrating peer and self-assessment into module group work assessment design

### Assessment overview

This case study focuses on embedding peer and self-assessment into the assessment of group work. This occurs during the Year 2 Design and Professional Practice module, which consists of four assessments:

- a product specification document;
- a group presentation;
- Demonstration Day (which includes a group poster presentation);
- Final report

Students are assigned to a project group (of approximately 10 people) based on their project preferences and complete all the assessments in the same group throughout the year. They peer assess the group presentation and peer and self-assess how they worked in the group in the final report that brings together their work on the entire module.

### Overview of assessment methods on the module

The Design and Professional Practice module is a project-based module that allows students to demonstrate a range of skills through working together as a team on delivering a project. This is reflected in the ILOs:

1. Demonstrate an understanding of the product development process (PSD, Final report)
2. Participate in the formation of a functioning project team (Final report)
3. Evaluate suitability of concepts against key criteria (PSD, Presentation, demo and poster, final report)
4. Select appropriate prototyping techniques to realise a chosen design concept (Presentation, demo and poster, final report)
5. Report using various media on the project progress and outcomes (presentation, demo and poster, final report)

The ILOs are closely linked to the assessments. There are four summative assessments in total, each weighted at 25% and each supported with formative learning and assessment activities:

- Product specification document (PSD) - a written document produced by the teams outlining the product they will be developing. The students are provided with a template that they populate with requirements relevant to their project with the support of their supervisor (a staff member). The teaching that prepares them for this assessment is delivered via flipped classroom, i.e. students are provided with a video to watch prior to the class and once they meet the focus is on clarification of the content of the pre-class learning. The students are supported with activities that are based around the PSD to help them develop it. Those activities involve clarifying the purpose of the PSD, narrowing down user requirements and technical specifications. Additional support is provided in the form of a full formative draft submitted to their supervisor in the early stages of the project. The students receive balanced feedback (that incorporates both suggestions for improvement, and strengths) that can be



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incorporated for the next stages of the project and for the summative submission of the PSD.

- Group presentation – each group presents their potential product as outlined in the PSD to their tutors and peers. The presentation lasts approximately 15-20 minutes with each group member asked to present. The presentation is peer and tutor assessed.
- Demonstration Day – each group produces a poster outlining their product and a prototype of their product that is summatively assessed. Demonstration Day is conducted in the form of a science fair where each project group is allocated a stand where they discuss their ideas with the audience (i.e. other academics and students). Currently, as staff are split across the campuses it is tricky to get a suitable number of colleagues available to engage with the projects so students are encouraged to mingle and talk with other groups. This means that there will be some group members standing by the project poster and others walking around and discussing other people's work. The purpose here is not to peer mark but rather see what everybody else was working on and push their thinking about their own projects. The assessment takes into account the poster, both the visual and the content, how the group members answer the questions and the prototype itself, whether it looks like it will meet the criteria that have been set. The discussion focuses around what the prototype needs to do, what the user needs from it and whether it looks like it's going to be safe and functional.
- Final report – this assessment brings all of the learning from the module together and consists of two parts. Firstly, it is a standard technical report which looks at design, how it meets the criteria set in the PSD, whether it met the targets or whether it needs development and what improvements would be made. The other half of that discussion in the report focuses on how the group reflection on how they approached the project and what they might do differently in the future. The report is a group submission.

The assessment on the module relies heavily on team working. The focus is not on doing a good design, in fact the prototype is only half of the demo day. The majority of the assessment focuses on presentation and mostly teamwork, which is what ties all of those assessments together.

### Rationale for group work and assessment choice

The assessment structure models what students might be experiencing going into the industry hence is based on [authentic assessment](#) principles. Engineering is inherently a team-based discipline, very few engineers work in isolation. As such team working is one of the [transferable skills that employers look for in their graduate employees](#). Outside of the group work elements, the work that students are asked to do also resembles real life practice. For example, a lot of the structuring of DAPP2 module, such as the PSD for example, come from the module lead's own experiences working in a multi-disciplinary team in an Engineering Consultancy near Cambridge.

Students are going to have to work in a group no matter what they do. There are hardly any job descriptions that do not equivalent a group working collaborative element. This is specifically the case with Bioengineering as the nature of the industry is that it consists of many small to medium companies. Hence the nature of the industry and the associated pressures placed on smaller companies make group work even more intense. Learning how to deal with conflict within groups and understanding the different mechanisms for collaboration is important. It is important to note that it won't be just product design teams that students will be working in but also the marketing teams and product sales teams and also clients. As the industry is developed around pockets of expertise this groups work will take place on several levels hence the ability to adapt to working in and with different groups is extremely important.



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Hence the module aims to give students as authentic experience as possible within the constraints of the university setting.

### The nature of the projects

[The projects that the students work on address authentic problems in biomedical design that require solutions](#); by the end of the project each group will be close to having a product that could be made and marketed to real clients. The projects are different every year but tend to be centred around disability and frugal healthcare, i.e. making games and toys accessible for users with disabilities or specific medical needs, for example designing a more engaging exercise system for children with cerebral palsy or designing smart packaging for those with peanut allergies as illustrated by the briefs below:

#### **Smart packaging for food allergen sensing**

*The presence of allergens in food products such as milk, soybeans, crustaceans, eggs, gluten-containing cereals, peanuts, and nuts (e.g., almonds, Brazil nuts, cashews, walnuts) is an increased safety concern, as prevalence of food allergies due to even trace amounts of allergens is increasing. Conventional packaging methods have been used to facilitate product handling, but also to preserve nutrition value, extend their shelf life, and reduce spoilage. This project is to develop smart packaging that can incorporate sensing platforms which provide information about the presence of potentially deadly allergens.*

#### **Adaptive Gaming**

*Duchenne muscular dystrophy is a degenerative condition that affects predominantly young boys around the age of 5. It progressively leads to the loss of muscle strength and function. It was previously thought that children with DMD would not survive past 15 however improved care and support in recent years has seen people with DMD living into their 20s, 30s and beyond. As their age increases the level of muscular function reduces. With the current trend for retro-gaming, and popularity of miniature game consoles pre-loaded with thousands of game titles, this project is focused on providing some enjoyment and entertainment for people with DMD, incorporating various form of assistive technology to enable users to*

*control the type of computer games they would have played when they were younger.*

By having a variety of projects it makes for more of an authentic experience, the team get to engage the students with real-world end-users whose input then steers the direction of the project. This is another skillset that the Professional Engineering Institutions are looking for. The groups that the department works with are aware that these are student projects, so they know that the outcomes can be variable. Typically the module has recurring projects such as the Adaptive Scalextric (in partnership with John Chilton School) set or Augmented Reality Learning (in partnership with the Pace Centre).

### Practicalities

#### **Assigning groups**

The groups are formed based on students' project choices. The module team puts out a project list every year and the students get to pick three choices in order of interest. Students are asked to provide a short 'tweet'-like justification of why they should be allocated their chosen project. The reason why the justification is only around 180 characters is to help students learn to be succinct and to the point – an important skill for the discipline. This justification serves as the basis for project allocation.

The module team also tries to diversify the groups by ensuring that the students have different backgrounds in terms of gender and nationality. In the past they found themselves having some groups that focused on specific nationalities and the feedback from students indicated they would prefer more variety hence the module lead pays special attention to this when allocating group members.

Students value the variety of perspectives that working in diverse groups enables them to gain. In diversifying it is best to avoid isolating individuals e.g. putting one female in a group. It is useful to make a feature of the value that their diversity brings (see section on negotiating ground rules) and acknowledge that establishing working practices in diverse teams can be challenging and takes time. Contrary to common practice, it's helpful to allow



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...students to remain in the same group throughout the year to develop and refine working relationships, build trust and mutual understanding, and address tensions. This is important for rising to the demands of assessed groupwork - typically our students are learning to apply new concepts and completing complex, unfamiliar tasks. For many people, for many reasons, the social and emotional effort involved in getting to know and cooperating with new people increases the cognitive load, in a way that can compromise the intended learning. This may be particularly relevant if you identify as being from an underrepresented group, such as LGBTQ+ or an ethnic minority, or have additional cognitive challenges such as working in a 2nd or 3rd language or having a specific learning difference such as being autistic or having ADHD. In terms of the argument for variety, across the whole degree programme students will likely work with sufficient different people. Extended time working in the same team also resembles authentic, wider world practice.

Such big groups can be tricky as there might be imbalance in how groups are subdivided. It becomes progressively difficult to address individual difference and make all students feel comfortable in large groups. This means that it is more difficult to monitor students' with specific learning needs and make sure they do not 'disappear' into the larger groups.

Given the nature of the industry it is extremely beneficial to give students an opportunity to work in different group sizes. Potentially there is more scope for conflict in a bigger group than there is some smaller groups so learning how to handle it in a professional way is an important skill. This is in addition to other skills that can be boosted by working in larger groups including communication, negotiation, adaptation and being reflective.

The rationale for assigning groups based on project groups is that this resembles authentic practice, as this is likely to be a situation that the students encounter when they start a job in this industry. Learning to work effectively with previously unknown team members is arguably an important transferable skill, which could be of value to potential employers.

In some circumstances, students may wish to swap groups. This is possible, and students do this by explaining to the module leaders why they wish to switch groups, and then find someone from another group that they can swap with. This approach limits the administrative burden on staff, whilst giving the students some flexibility and is hardly ever utilised by the students.

The groups tend to be relatively large – approximately 10 people. Such a big number could potentially encourage uneven distribution of work with 4-5 students taking the lead and doing the majority of the work and the rest just floating around on the periphery; such behaviour is potentially easier to get away with in larger groups.

However, the reason for such large groups is to diversify students' group learning experience (in terms of range of skills and personalities within the group) and develop skills around working in a large group dynamic. This module is the main opportunity for working in large groups, as students tend to work in smaller groups of up to 6 in years 1 and 3. On a more pragmatic level, having larger groups makes marking and feedback more manageable, as there are fewer groups overall.

### Preparation for group work

As the module is based on group work, the first two taught sessions go into group working and team building. [These sessions are an opportunity for the group members to get to know each other, allow them to set ground rules for group working and develop their listening, communication and accommodation skills.](#)

Allowing students two sessions to get to know each other, with a scaffolded requirement to negotiate ground rules is excellent practice. All too often the academic pressure is added straight away without time to form as a group! To enhance this formative process, and take advantage of the groups' intentionally diverse nature, students...





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...could be encouraged to consider the intercultural learning potential when negotiating ground rules – e.g. how are values around group working and contribution and practical approaches influenced by background and culture, as well as previous experience? Could each student offer a ground rule that reflects their values, to be refined as a group? Setting ground rules should go beyond practical considerations and take into account the crucial emotional dimension of learning. e.g. what enables individuals to feel confident and comfortable enough to contribute to a discussion or decision-making? Is turn-taking a good idea initially? Negotiated ground rules could then be used to inform peer assessment of group working.

When introducing group work some consideration needs to be given to how students with specific learning needs can be successfully participating in group interactions. All students involved should benefit from inclusive practice this means that inclusivity considerations can be embedded within standard practice around preparing students for group work. This can be done through discussion around the allocation of roles and better understanding how others, including those with specific learning needs such as dyslexia, autism, dyspraxia etc learn and communicate. Individuals should be mindful of that and think about the delegation of individual tasks that are appropriate to what individuals can do. Therefore part of preparation for group work is considering how others can be mindful and empathetic towards other group members.

The setting of ground rules is facilitated through reflection on what worked and what didn't work for individual students based on their past experiences of working in a group. This allows the group members to identify behaviours that encourage good working relationships within a group that can be incorporated in their ground rules list.

Development of communication skills is done through a back-to-back drawing activity – a pair description activity where the speaker describes a geometric image from a prepared set, and the listener tries to turn this description into a drawing without looking at the image. The reflection on the activity focuses on the following:

### Speaker Questions

- What steps did you take to ensure your instructions were clear? How could these be applied in real-life interactions?
- Our intended messages aren't always interpreted as we mean them to be. While speaking, what could you do to decrease the chance of miscommunication in real-life dialogue?

### Listener Questions

- What was constructive about your partner's instructions?
- In what ways might your drawing have turned out differently if you could have communicated with your partner?

The listening aspect is further reinforced through a 'pet peeve' activity where each person has 60 seconds to 'rant' about something. The listeners then have to 'decode' the rant by isolating the key positive points. This activity aims to help teammates appreciate that feedback has positive goals.

The final activity, zen counting, focuses on accommodation skills. Zen counting is incredibly straightforward: team members simply sit in a circle but face outward. With nobody in particular starting first, they are asked to count from one to ten as a group, but each member can only say one number. Nothing else is said. When someone repeats or interrupts another group member, they start again from one. The idea is to facilitate being uncomfortable and silent, while team members practice letting others speak.

### Monitoring group work

The four assessment points plus regular contact with project supervisors

In any module that relies heavily on group work it is important to establish common ground rules around group work as well as to be alert to where a tutor might need to step in and reassert rules of engagement.



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help the module team monitor progress, in terms of students' group work and group behaviours. This is also done in a more formal way through utilising OneNote. OneNote pages are set up for each group so that they can document all their meeting notes and use the pages for communication. This is also supplemented with Teams channels.

The OneNote pages are useful for tracking progress, but they can sometimes take a while to set up. It can be disheartening for the module team to see these not being used by the students. This is often the case as students prefer their 'private' channels such as WhatsApp. As the module team wants to be able to monitor how each group's work progresses and how contributions are distributed, they ask for evidence of any discussions outside of the designated channels to be summarised and posted on the formal channels (OneNote/Teams). Students also produce a Gantt chart to plan their group work which gives a good overview of how they wish to progress throughout the module which can be checked against real time progress.

Typically the OneNote pages would be looked at by the module lead a couple of times a term to check they are being used. The lead would also message the Supervisors and Students to remind them to make use of them as a means of logging meetings notes and research. Interventions are more likely to be triggered by someone in the team contacting their supervisor or the module lead to note an issue with a team member not contributing. This would then open the discussion up to their personal tutor and the senior tutor in case it is connecting with ongoing issues for the student.

### Marking arrangements

Tutor assessment on the module

The tutors mark and provide feedback for all assessments. For PSD tutor feedback is provided at the formative stage via Turnitin with detailed comments around how the PSD could be developed further. There is a standard form that each group needs to fill in focusing on:

- Functionality and performance
- Size and weight
- Usability, interface and ergonomics

- Portability
- Safety and security
- Life, reliability and maintenance
- Cost
- Legal and regulatory requirements

[The marking criteria can be found here](#)

Group presentations are assessed by the tutor and peers (please see embedding peer assessment section for more on that) with the assessment criteria being generated by the students (more on that in the peer-assessment section). The tutor comments for this part of the assessment focus on the following:

- Slide visuals
- Slide content
- Presentation structure
- Presentation timing
- Presentation technique

[An example of a marking form can be found here](#)

Each presentation is marked on a group basis so there are no individual scores for individual presenters. In the past, when peer marking was not involved, individuals in the group would be marked by academics. This meant that each presenter had to wear a name tag and present for at least two minutes in their part of the group. This meant academics were trying to write down as much as they could about this students' performance. This never worked out particularly well as it was easy to miss a name and compromise the marking system. Giving a group mark rather than an individual mark also means that the groups don't have to stick to a linear presentation, where each person presents one after the other; this creates a more flexible format for the presentation, where different group members can chip in, in a more organic way, throughout the talk. Hence an overall group mark is more fair and more practical for a presentation of this type.

In addition to that, some of the students get really stressed about presenting. Given that it's only their second year, the module lead wants them to have the experience without stressing about how well they're doing at it or how good their English is if they are not native speakers.

For the Group Presentations, the peer marks (done



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by each student individually) are collated and the average for the group is then calculated. The Group Presentation is marked by multiple members of staff (ideally between 3-5) including technicians assisting on the projects.

In terms of managing staff marking, you may conclude that two staff assessing group presentations is sufficient. Variation in marking can be addressed, to some extent, by ongoing discussion of how assessors understand and apply criteria, including in marking meetings. This may inform refinement of the criteria, as perspectives on what's valued and inclusive in presentation and their assessment evolve. Providing the value of difference of opinion in feedback is made explicit to students, learning to make sense of this variety is a useful life skill.

The averaged peer assessment mark is then added to these as if it was an extra marker. So Marker 1 may give 67%, Marker 2 69%, Marker 3 75% and the Peer marks might be 85% ... these would then be averaged to give the final grade for the Group Presentation for that group, giving an average of 74%. Typically the peer assessment grades are higher than the supervisor grades but the module team tries to make sure the standard deviation isn't exceeding 10%.

The poster and the demo day is solely assessed by the tutors. The marking criteria is sent out to the students before the day so they know what to expect. Those can be found here (link to the criteria) and focus on:

- Poster visuals
- Poster content
- Questions
- Technology design quality
- Technology function

The Demonstration Day is open to other academics in the department (including technicians helping students with the project) and the external examiners if they are on site. This allows for a good collation of opinions from about seven sources altogether to give the final average grade from all of those sources for the demonstration and the poster.

The role of the external examiner is to confirm that the marks have been given appropriately based on what they've seen and they are comparable to what is being seen in the sector. The external examiner should be involved in feedback around the process of assessment so it's important to ensure that their role is clear if they participate in any 'live' demonstration/ marking events.

In order to ensure that all of the markers are prepared for assessment they are provided with marking criteria and a mark sheet. There is bound to be a variation in marking with some staff being harsher markers than others but the variety of opinions included in the calculation of the final grade allow for evening out of the extremes.

The final report is marked by the tutors (and combined with peer scores) according to the following criteria:

- Writing style
- Introduction
- Final design
- Discussion
- Group working
- Risk management
- Ethical consideration

[Please see full marking criteria here.](#)

### Incorporating peer-assessment

There are two instances during the module where [peer assessment is integrated](#): for presentations, where the output is assessed; and the final report, taking into account the overall experience of working in a group whilst delivering the project.

As the focus of Bioengineering industry is on developing new products, as exemplified in this assessment, employees will need to be able to take feedback on board from different team members and will need to be able to give feedback to other teams in a professional way.

When it comes to peer-marking of presentations, each student is allocated three videos (this was also the case when presentations were pre-recorded during covid) to do a peer assessment on. Students are asked to watch the videos in their free time and then log on to submit their final scores for the videos.



Working in diverse groups where students might (or might not) declare some learning difficulties can affect performance. Preparing students for group work (as suggested earlier) can help group members be more empathetic towards each other and make them aware of some difficulties others experience that can affect their performance which can be useful for peer marking. For example, an awareness that not everybody should be able to keep an eye contact for an extended period of time or that not everybody will be able to express themselves clearly and verbally because of 'labelling problems' (i.e. recalling of known information on the spot quickly). As much as you want to ensure standards of professional competence are maintained, there should be an awareness in the student group (as with the teaching staff) that there are certain things that shouldn't be marked heavily down because they could be a part of neurodivergent condition and there should be sensitivity given to these individuals.

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The main consideration from the Quality Assurance perspective is making sure that the rules of engagement in peer assessment activities are clear to the students from the start. This is where a good explanation about what the learning outcomes are for that module and how students are expected to demonstrate them is extremely useful as well. This could help manage students' expectations and emotions around modules that are creative yet can be considered quite challenging.

The scores were aligned to the marking criteria which were developed through discussion with the students in the supervisor session. The criteria are created through asking students to reflect on a series of questions such as:

- what makes a good presentation based on the presentations that you've watched in the past?
- What made them memorable for you? What makes them stick out?

Peer assessment is a valuable learning process both for the giver and receiver of the feedback. Three presentations is a sensible number – remember that peer assessment is hard work and time needs to be allocated for it. Enabling students to co-create criteria gives them insight into the complexities of the assessment process and a sense of ownership or agency – they are able to influence how their assessment is judged based on what's important to them, from an audience perspective. This should also result in feedback that they see as useful and can apply to future presentations. Peer assessment can, more simply but no less effectively, involve students giving each other feedback and no marks. This still has the educational benefit of requiring engagement in each other's presentations, practice giving feedback and a useful amount of insightful feedback for each student. It avoids student concerns about the fairness of peer assessment. Some believe that students take peer assessment more seriously if they are required to give a mark, so if you choose to adopt that approach, like staff, students need preparation for peer assessment. As well as being introduced to assessment criteria and rubrics / mark schemes ahead of time, it is beneficial to allow students to use these tools to assess exemplars of students' work with different strengths and aspects for development. You should seek permission to use anonymised exemplars from the originator or create examples based on typical student work.

This reflection allowed the module team to pull out important things in a good presentation so that it can form the basis of the marking criteria. These ideas are collected group by group (17 groups altogether) and then formatted into the standard assessment criteria which are then sent out to all the groups in advance of the deadline so that they know what they're going to be assessed against. The scoring of peers is done against those criteria. Students receive further guidance on what is A, B, C etc level performance.





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This approach to preparing students to peer assess presentations has been successful so far. There is a tendency for students to mark 10% higher than the academics but the fact that peers mark individually (hence the final grade is a combination of different sets of scores, i.e. each project will receive 30 sets of scores - 10 students in each group, 3 groups marking each project) eliminates any potential issues with big discrepancies and narrows down the impact of extreme opinions.

There is always a worry from the students that they will not be fairly assessed by their peers. A common concern expressed by the students is that peers will be marking their friends highly. This concern is managed at the point of briefing by explaining the value of having such a big cohort of 180 students in terms of potential anonymity. It is impossible for all the students to know each other hence it is highly unlikely that friends will be allocated presentations of other friends. It is more likely that students will not know the groups they are marking. In addition to that any extreme opinions are evened out once the average score from all the markers (peer and tutor) is calculated.

The reason why each student only marks three other presentations is related to workload. Looking at three presentations is a manageable task, and is likely to give each student exposure to work that ranges in standard.

Peer assessment also takes place at the end of the module with the final collated group grade. WebPA (Feedback Fruits from this year on) is used to get the students to rate the input of their fellow teammates against a marking criteria that is based on the ILOs. The group grade is then put into WebPA and an individual grade generated based on the peer scores which allows for a variation up to 25% in the final grade. Peer assessment is done according to the following criteria:

- Understanding of the product development process
- Participation in team working
- Contribution to research and concept evaluation
- Practical involvement in experimentation or prototyping
- Contribution to documentation, presentation and report writing

[All marking schemes can be found on the webpage.](#)

As Web PA came to the end of its 'life' the College supported system that serves a similar function of setting up peer assessment marking and peer feedback online is Feedback Fruits.

Template standardization for peer assessment across the programme where there is a heavy group work and peer assessment component that builds on previous experiences, can also help with student preparation. A level of familiarity with how the software is set up and how the marking rubrics are set up can help build students' confidence with how to approach the task.

### **Incorporating self-assessment (reflection)**

[The reflective element is attached to the final report.](#) The students are asked to [reflect on how they performed as a team](#) and what they would do differently. Students reflect on a variety of aspects of the process of



From the careers perspective, one needs to be self-reflective in order to first secure a position. This involves the ability to break down experience, justify it and explain it in a job interview. Secondly self-reflection is important to progress through career. Professional development activities need to be completed on an annual basis and reflection is an important part of that. Most employers these days are asking for students to be reflective because this indicates that those students are not afraid to speak up when they make a mistake.

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working on the project – time management aspects (for example starting prototyping sooner), doing more research, engaging with users earlier on, better distribution of work load, better communication, etc. This focuses on practical understanding of what they could have done as a team to get a better outcome or to make life easier for themselves. [This type of reflection is also good for those groups that worked well as there is always something that could have gone smoother.](#)

This focus on reflecting on things that didn't go well is very important for employers. This indicates that an employee can, first of all admit when they went wrong, develop enough insight to learn from that experience, and most importantly ask for help if needed. One of the interview questions that students struggle with is 'tell me about something that didn't go well'. This questions tends to be problematic because Imperial students are not particularly good at admitting to failure. Teaching them to reflect on aspects that didn't go well helps them not only to accept failure but also learn from it in terms of this reflective process. This skills is sometimes tested in an interview setting were interviewees are asked to create something in a group in an assessment centre and then are asked to individually reflect on what they had experienced. Self reflection activities help students understand how to appropriately discuss something that did not go well.

The advantage of group reflection is that it requires students to discuss and reflect together on experiences and feelings that may otherwise be left unconsidered, including around differences of opinion and approach. It enables more learning from different perspectives. But for this to happen we need to be confident that individuals can really express what they think about their experience and feelings, in the presence of those who were so involved in their experience. If you believe the value in reflection lies in an individual making meaning of their own experience, you might encourage group members to talk about their group experience and ask them to reflect on it individually either in writing or as a podcast or vodcast. Reflection, especially this type of more formalised (assessed) reflection is a difficult process and not at all natural to many. Giving a short series of questions to guide reflection can help to get people started and lead them in direction that is aligned to the intended learning. e.g. What is the most important thing that you learnt about yourself during this group working? What is the most interesting thing that you learnt about working with other people? What would you do differently next time, on the basis of this experience? How could this group working project be better designed to help you learn what's important to you?

The report also has a breakdown of their Gantt chart for the project and work allocation in the groups. This access to work allocation is useful to see individual contributions but also useful if students come back asking for references for future study or work as it clearly outlines their responsibilities within the project.

The marking of the reflective part takes place more holistically meaning it is one of the criteria for the final report assessment. In the past, each criterion would be allocated a percentage. What this meant, however was that the discrepancy between the markers was much greater than if the percentage was not allocated but rather the markers were asked to arrive at the final score more holistically (but still taking the criteria into account).



A productive approach can be: frame this conversation by asking students to note down, then discuss in small groups/pairs: What makes feedback effective / useful for you? How does feedback make you feel and why? This activity can be extended by asking students in small groups to look at exemplars of feedback and discuss: In what ways it is useful? How would you use it? Could be improved? How it would make them feel? It is also useful for student to practice giving feedback using exemplars. These steps can help to develop students' feedback literacy (Carless and Boud, 2018). Here's some [guidance on giving feedback for staff that you may like to adapt for students](#).  
Carless, D. & Boud, D. (2018) The development of student feedback literacy: enabling uptake of feedback, *Assessment & Evaluation in Higher Education*, 43:8, 1315-1325, DOI: 10.1080/02602938.2018.1463354

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### Preparation for peer marking and peer feedback

[Students are prepared to peer assess and give feedback](#) to others through a taught session that focuses on developing basic skills around this area. The students are presented with the rationale for using those approaches and the value of them in developing transferable skills as well as their own understanding of assessment criteria and feedback practice. As students generated the criteria for the presentations themselves, they already have a good understanding of what is expected from them.

The session starts by asking students to reflect in groups on their feeling around preparedness to assess others. This then leads to the discussion around the value of those skills in the future and their transferability to other areas of student experience and future professional lives. The session also goes into characteristics of effective feedback, which should help students with the qualitative comments they are asked to produce for the two instances of peer assessment.

It is also useful to be aware of the fact that students with autism and dyspraxia find it difficult to pick up on metaphors. Similar thing can sometimes be said of international students. There is an assumed knowledge and understanding from first language speakers associated with verbal (and written communication). It is important to discuss this with the students and make it part of their preparation to give peer feedback.

### Preparing students for reflecting

This is an area that students might struggle with as it's not necessarily something that comes naturally to everyone. Some of them provide real in depth reflection on what happened but some students will approach this task very factually, i.e. this is when we met this is what happened in the meetings. To prepare students for summative reflection the module team conducts a session where they encourage reflective thinking. The session focuses on the students reflecting on their experiences so far through considering what they would tell themselves if they could start again, what would they do differently and advice they would provide to themselves. This activity is conducted as a group session with their supervisor.

Students on the autistic spectrum might find reflection challenging. Understanding personal motivations and awareness of how learning journey had happened can be difficult for these students to flesh out. Students should be offered individual support from the Specific Learning Difficulty Tutors.

### Establishing grades from tutor, peer and self assessment

The self- assessment grade is included in the WebPA system. Students evaluate each other and themselves for contribution to the project (see table above). The group grade is input to WebPA and it automatically calculates the individual grade based on their peer assessment / self-assessment scores. The grade therefore is a combination of self-assessment of how they think they did versus how they think everybody



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else did in their group only. The students have access to the qualitative comments their peers submitted about their work as well as numerical grades. The grades variations are typically quite small as for the most part groups work well together. Occasionally a couple of students might show a larger drop in marks because they were not engaging as much as others were. The grades typically reflect the engagement the module team sees in the supervisor sessions. In the last 8 years the only time there were actual complaints from the students was when somebody who didn't score particularly well lied to their peers about the grade they received. Hence there was some perception of unfairness that had no reflection in reality.

The group grade is generated from the 4 assignments (each contributing 25%). This mark is then adjusted by up to 25% (so in theory a team member in a group scoring 80% who scored really poorly in the peer assessment could end up with an individual grade of 60%). The average of the group has to remain the same however, so if someone goes down a bit, everyone else has to go up a little. This is going to be different from this year on as the College has moved to using Feedback Fruits (FF) instead of WebPA, and FF does not appear to run in the same manner.

### Provision of feedback

Across all of the assessments students get qualitative feedback, tutors provide feedback on each of those assessments, in addition there are instances of peer feedback for the presentation and the final report. For the presentation the students are instructed to give three comments about each of the presentations that they watched: 1) what's good about it 2) what's not good about it and 3) what could be improved. This very much resembles the type of feedback conversations they would have with their supervisor. Supervisor feedback is very closely linked to the marking criteria in the sense that for each element of the marking criteria, there are a couple of comments that relate directly to that. This feedback is collated alongside peer comments and passed on to groups. (see feedback sheet as an example)

The students generally approach the task of giving feedback well. The first few times it was done

there were some nice comments that have really been beneficial for the students to read, because they sometimes are not able to look at their own performance objectively and tend to put themselves down. Seeing comments from their peers allows them to see how others perceived their contributions and calibrate perceptions of own performance and their own feedback. It is also useful for the students to see the variation when it comes to what different people value in a presentation. The module team have had situations in the past when one person would say "brilliant presentation, excellent images" and then some people saying "you could have used images better". It is important to show the students those comments to make them aware of a level of subjectivity involved in presentations and any other type of more creative/ subjective work - opinions will vary depending on who's watching. While student feedback is monitored, the only comments that are removed are those that could be considered offensive or overly personal. This, however, is extremely rare. Any variation in opinion is left as the module team considers it an important lesson for students to learn.

The module lead tends to detach the feedback from the grade. What this means is that feedback is released first, for example in the morning and the grades are released later that day. This encourages students to engage with feedback first. In previous when the grades were released first, students who had not done well on an assignment would immediately be in contact to argue their grade. In this case the module lead would meet with them and go through their submission with the marking criteria and discuss areas for improvement. Now they get a chance to go through the comments first. The module lead also try to stress that this module is not about grades but it is about the learning experience, it is a safe space for students to try new things out and see how they get on.





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If you decided to give students feedback before a mark, it is important to also give them a structure and reason to engage with the feedback. A suggestion is to get them to derive actions points that they will take away and use in a future assessment for to develop themselves more generally. Once they submit these they can receive the mark. Alternatively, some students find it helpful to have the mark to be able to make sense of the feedback and not knowing the mark may be very distracting. Like all educational decision-making you need to have thought through your rationale and what your chosen approach intends to achieve!

There are different approaches that can be taken to recording presentations – for example, those can be recorded in a lecture theatre using Panopto installed on College machine, students can record themselves with their mobiles. While the way of recording might differ what is recommended in the Faculty of Engineering is using a video assignment option in Panopto to upload the work to platforms.

### Online adaptations

The assessments were delivered in a similar form during the pandemic with some alterations to the group presentations and the Demo Day. During Covid, group presentations were pre-recorded. There were some advantages to this – ability to rehearse and re-record and lower level of stress for the students as compared to live presentations, and some practical benefits in terms of not needing to find the room, however there is value in teaching students skills necessary to be good face to face presenters as well. For the time being the Group presentations are kept as video submissions though.

When assigning video submissions it is important to be clear about what the output expectations are so that students don't spend unnecessary amount of time producing high quality videos when creativity and quality of output in terms of visuals is not assessed. The priority should be ensuring that the ILO that the video relates to is appropriately measured.

Similarly, the Demonstration Day during Covid was conducted as a video presentation. It is currently held as an in person event as it is much more rewarding.

While it was possible to conduct group work online this proved to be tricky for building good relationships between group members. Preparing students for group working was also more challenging online as the team building exercises tend to work better in person and do not fully translate onto the online environment.

### Strengths of peer assessment, self assessment and group work in the context of the module

- Peer assessment of the Group Presentation encourages student to consult the assessment criteria and in some cases produces some insightful comments;
- WebPA/ Feedback Fruits provides individual grades based on input to the project as a whole which otherwise could not easily be produced;
- Students are better placed to review each others input into the project than the supervisor who would only have 30 minutes contact time a week with the group;
- The Peer Assessment element Acts as 'carrot and stick' to encourage engagement in the project;



## Integrating peer and self-assessment into module group work assessment design

- From careers perspective, all elements including peer work, group work and peer feedback help students develop important skills that employers are looking for;
- Assessments are designed with authenticity in mind promoting better student engagement

### Limitations of peer assessment, self assessment and group work in the context of the module

- The peer assessment will always produce a negative reaction in some students who either don't trust their peers to grade them fairly or think that somehow others will be gaming the system;
- The reflective element is really difficult to achieve and is very hard to teach in the supervisor sessions;
- The group working is the probably the most difficult aspect of the module, particularly for 2nd year students who are heavily loaded, quite often a couple of students over the cohort will disengage from the projects which leads to frustration and conflict in the team. During Covid, trying to do the teamwork remotely made this situation significantly worse;

### Advice for implementation

- Ensure that preparation for group work focuses on the discussion around how to handle issues within groups, such as somebody not contributing as required or the group not distributing the workload appropriately – discussing management of teams is important;
- While you might have some preferred channels for student communication, as is the case with One Note pages and Team channels, you still might find it that students prefer using their own channels such as Whatsapp. Setting up those more official channels can take a lot of time and it can be quite frustrating to see them not being used. Establish early on whether you want to have insight into what is happening in groups and find ways that students can provide evidence;
- When using activities that prepare students for group work it is important to make sure that they do the required activities rather than jump straight into discussing their projects. This is something that the facilitators should be attuned to;

- There is definitely value in group reflection but from careers perspective practising individual reflection is also extremely valuable as it aligns more with authentic practice that students will experience in a workplace. Students (or employees) will be asked to do a group analysis but in terms of professional development doing an individual reflection is more common and having an opportunity to practice this alongside group reflection/ analysis would help them develop skills to get the job in the first place and work through performance review processes. This is why fleshing individual reflection alongside the group one can be very valuable. [Please see this video about group vs individual reflection.](#)
- When deciding on the number of assessments ensure that the work required to perform them can be done within the allocated time as indicated by the ECTS value. It is also useful to take the broader programme level view to identify how assessments on one module overlap with others. This should help avoid overassessing and ensuring that assessment diet is appropriate for the hours of effort;
- Patience is key, especially with having students to transition from using their technologies to the more official ones (here move from Whatsapp to OneNote). There will be teething problems and consistency is key – it's a process and a journey;
- It is useful to consider what is more valuable – peer feedback or peer marking or both. Thinking of the pros and cons of each and considering the end goal of learning on the module can help decide on the most appropriate route.