Anatomy of Assessment

Chemistry of Molecular Systems Group Poster Presentation

Faculty: Natural Sciences
Department: Chemistry
Module name: Chemistry of Molecular Systems
Degree: BSc and MSci Chemistry with Medicinal Chemistry, MSci Chemistry with Molecular Physics
Level: Y2
Academic Years: 2021-2022
Format: Group poster presentation, coursework
Approximate number of students: whole year group, ca. 200 students
Delivery mode: Group coursework, presented on one day across 3 South Kensington campus lecture theatres
Duration: set over the 8 weeks of Summer Term, 14 hours of work from students + one 1-hour workshop
Weighting and credit: 30% of module, module is 8.3% of Yr 2, Yr 2 is 20/35% of BSc/MSci degree respectively
Module ECTS: 5
Module Type: Core

Insights colour key

Educational Developer

Inclusivity

Learning Designer

Registry

Careers

Educational Technologist

Assessment overview

This assessment involves students working in groups of four, to create a poster on what they deem to be the 'Most Interesting Molecular System'. They then present this poster in a 10-minute presentation (plus 5 minutes scheduled for Q&A) to about 40 of their peers. The topic is purposefully left very open, without any restriction to inorganic or organic chemistry despite the module being largely inorganic; this is to make it as engaging as possible and to reflect how different parts of chemistry are interconnected across most research areas.

A poster creation in itself is a useful skill to develop for those moving into research-based, purely academic or science communication types of roles. However, the idea of creating concise content which goes on a poster is a highly transferable skill for almost any discipline.
The group work element is helpful in developing negotiation, as agreeing on the most interesting molecule could potentially generate some lively debate.

Microsoft PowerPoint is usually used for poster design and works well for printed or electronic presentation. Outputs from other presentation tools may not be so good from an accessibility point of view.

Figure 1: The example poster shown to students on Blackboard as a guide of what is expected

Watch these videos on exemplars:
1. What are exemplars?
2. Pros and cons of using exemplars
3. Strategies on how to successfully use exemplars

Design decisions

Rationale and design
To encourage thorough literature research and ensure groups choose appropriate topics, students are tasked to submit their choice of molecular system via Padlet by the first Friday of summer term (following delivery

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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 and dyspraxia) 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.

Watch these videos on group work:
1. Pros and cons of group work
2. How to prepare students for group work
3. Different ways of assessing group work
4. Advice when implementing group work

of the instructions for the module in week 8 of term 2), which staff then review. Groups are thence advised that their choice of molecular system is either fine, or potentially inappropriate, in which case they are advised to choose another. Molecules must be relatively recently discovered (the rough guidance is within the last 20 years) to keep topics relevant and interesting.

Note that Padlet is not College supported. Aleternatives for choice submission on College supported applications can be via a Blackboard quiz, MS Forms, or Qualtrics.

The ability to choose own area of interest is a great example of inclusivity in action; according to Universal Design for Learning principles, students should be presented with the opportunity to integrate their own interests or their own unique problems to be solved.

The poster presentation format was chosen because the course didn't include any such presentation, apart from in an optional year 3 module, before the heavily weighted BSc project poster presentation. To keep students engaged in other groups' presentations, a 'question roulette' is used. This involves each group being allocated another group to which they must ask a question, with the allocated group being announced by staff just before the relevant presentation. This was found to work well, with students not only asking the one required question, but having more than enough questions to fill the allocated Q&A time even without the staff Qs. There was no replacement of this for those who missed the presentation.

Some considerations should also be given to how the poster presentation questions are organised. For example, one strategy could be pausing after a presentation and ask other to write down the questions to the presenters so that they have some time to prepare. This helps with the auditory processing side of things, i.e. not being able to recognise what needs to be done quickly by impeded understanding of what is being said – this is something that frequently presents in disabilities. Speed of response is something which is part of many neurological conditions. A combined approach of training & practice before the presentation and an adjusted response system to questions that is put in place can really help students.

For students unable to present due to disabilities such as anxiety, most were still part of a small group for selecting and researching a molecular system. However, instead of participating in the presentation, they were asked to write a short piece (with a one-page limit) on why they chose their molecular system, followed by a 10-15 minute viva with two members of staff. This was designed to maintain the teamwork aspect and ensure students have a fair assessment by maintaining the group research section of the assessment to minimise the workload on one individual student. The short writing was included to help students prepare for the viva and give staff an idea of what the student focused on in their research to inspire viva questions, and the viva format was chosen as a close mimic of the presentation format. A viva was also held for students who missed the

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Having appropriate equivalents is very important to allow for mitigation. What needs to be considered is ensuring that the same skills are being assessed. If this is not possible then the marking scheme needs to be adjusted to account for any differences in the mode of assessment.

presentation day (for example, due to illness), and was initially designed as a resit option for students who failed the presentation (though this was very rare).

In a viva, staff start by asking the student why they chose their molecule, then focus the questioning on the topics the student seems most interested in, where they have focused their research. If a student is struggling to engage with one line of questioning, staff aim to try a different approach to explore areas the student is more familiar with.

With presentations, especially in cases where every student is expected to present, some considerations have to be given to adjustments for students who might not feel comfortable to present. A short presentation shouldn't be challenging to many students yet, some students, for example those with severe autism, might struggle. Having an alternative, such as a short video, or, as in this case, a viva would enable to the student to deliver something which didn't mean they had to stand up in front of the group and do it. Such alternatives could potentially take the stress out of presenting. Providing students with choice is providing them with the option that suits their learning best or limits the impact of their disabilities.

When deciding on whether or not to offer alternative methods for presentation, such as a pre-recorded video, it is important to ensure that the ILOs allow this flexibility. If the ILOs or the competence standards indicate that public speaking and presentations are key to the final qualification or part of professional standards then students should be prepared and supported to present as part of helping them develop professional practice. The Disability Advisory Service offers preparation for vivas to students with declared learning difficulties but a level of support can be embedded into sessions. The support revolves around familiarization, having students practice and unpacking where the issue might be in relation to anxiety levels.

Alignment with Learning Outcomes
This assessment focuses on students working with unfamiliar molecules and applying concepts they have learnt throughout the course to unfamiliar molecules. As well as this, it also develops and assesses students' literature searching skills, which is evident in the impressive selection of molecules from students, and their understanding of the literature is shown by their presentation, in areas such as a molecular system's mechanism of action or evidence it exists.

Fit within the course
This module is designed to follow the Year 1 module 'Chemistry of the Elements' (CotE), with a similar inorganic focus and development of concepts introduced in Year 1. This Year 2 assessment is designed to be a progression of a Year 1 CotE coursework in which students record a group presentation on their chosen aspect of an allocated group of elements in the periodic table. The Year 1 CotE coursework involves less detail than the Year 2 assessment, as in Year 1 students have to cover multiple elements instead of just one molecule, with no expectation for students to describe evidence taken from literature to support their claims. As a pre-recorded presentation, it is also a stepping-stone to presenting in-person as required in the Year 2 assessment.

This Year 2 poster presentation also aims to prepare BSc students for their Year 3 BSc project, which is assessed by a poster presentation.

Assessments that link to and build up the skills that are then further in other years presents a more connected assessment strategy.

Practicalities

Implementation
Designing this assessment was not too time-intensive (roughly a few

Allowing students some time in sessions to get to know each other, with a scaffolded requirement to negotiate ground rules around group work is useful for establishing good foundation for group work. 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 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 them be used to inform peer assessment of group working.

hours). Approving students' choice of molecular system also only took a few hours, which was carried out by one staff member in 2021-22 since diving the labour had led to some inconsistencies in 2020-21. The main time commitment lay in administration and hosting the presentations and viva. In 2020-21, organising the assessment to run online was challenging and a significant time commitment. In 2021-22, the assessment was run in-person, but some students didn't understand the importance of being on campus for an in-person assessment, which, along with groupwork problems and students who could not present for a fair reason, led to hours of emails and scheduling. Streamlining this administrative load, and the communication of presentation alternatives for future years is a priority; part of this plan is to use the coursework Blackboard Discussion Board to host an FAQ thread. Other areas with room for improvement include organising viva times with students via individual emails, and chasing students via email to submit their peer-assessment marks.

A one-hour workshop with two staff present was held the week after exams ended, to facilitate group work and offer feedback to students during the poster-design process. This was felt to have a high attendance rate suggesting students considered it useful, and required about 8 hours of staff time (i.e. two staff attend four workshop groups each, with 1 hour per workshop).

In 2021-22, the presentations were hosted on one day, across three lecture theatres. This involved five approximately 3-hour sessions (9:15-12:15, or 13:30-16:15), with a 30-minute break in the middle of each session. There were two members of staff in each session, who made their own notes on each group then decided on a mark and feedback for each group in the break and at the end of the session. The presentations therefore took about 30 man-hours to host.

Hosting the vivas was much more time-intensive than hosting the group presentations. Excluding organisation, each student taking a viva represented about 40-50 minutes of staff time, as the viva itself took 10-15 minutes with two members of staff present, plus about 10 minutes to mark. In 2021-22, this meant that despite a minority of students sitting a viva, hosting them took well over 6 hours.

Feedback and Marking

Two-thirds of the final grade came from staff grading the presentation and viva, and one-third came from a peer-assessment mark. In 2021-22, final marks were released to students 3 weeks after the presentation day.

Staff feedback was given to each group on Turnitin. To collect the peer assessment marks, students were asked to fill in an Excel template (figure 2). Students who did not submit justified marks for their group members were given zero for the peer assessment component. The average of the marks given to a student constituted their peer-assessment grade. The faculty learning technology team managed this aspect of calculating marks from the student-submitted Excel files. The comments of what each student

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Engaging students in the assessment process of the group work gives important insight into the extent of individual contributions. Even if group work is closely monitored, group members are better placed to evaluate contributions than the lecturer who only sees the snapshot of their experience. It is important though to make sure that the criteria against which the students are assessing each other's contributions are known from the start and it's useful to provide some scaffolding questions to structure feedback. In terms of design, if group work happens over a longer period of time it is useful to incorporate a point half way through for students to give each other feedback on how the work is progressing. This gives an opportunity for each member to evaluate others' and their own behaviours and contributions and make necessary changes for the summatively assessed stage.

did well or could improve on were collated and reviewed by staff, then given to students via Turnitin. This Excel-based method feels outdated – for future peer assessments, the college has introduced a new platform on 01/09/22, called FeedbackFruits, which can be embedded into a Blackboard page, and might be a more efficient alternative.

Figure 2: The Excel template used to collect peer assessment marks and feedback

The first time this assessment ran, the final mark had an additional peer-assessment component, as students were also asked to grade all the presentations that they watched. However, this was abandoned as not only did it create extra work chasing students, but it also diluted the quality of the marking, as students tended to just mark their friends highly instead of basing grades on the quality of the presentation. This extra peer assessment had been trialled to encourage students to remain engaged in watching their peers' presentations, but this has been replaced by the 'question roulette' initiative (see Rationale and Design).

When preparing students to give peer feedback some raising awareness around disabilities and certain barriers that students might experience is beneficial. The general training that emphasises the value of balanced feedback – using both praise and criticism, and raises awareness of the language that is helpful and unhelpful - can help students to be more inclusive when providing feedback to others. This could be further supplemented with a feedback template that emphasises the balanced focus (For example – what are strengths, what are the areas for improvement) and a discussion of examples.

Peer assessment is a valuable learning process both for the giver and receiver of the feedback. It is a time consuming process, however, in terms of student preparation to assess. This should involve introducing students to assessment criteria and rubrics / mark schemes ahead of time, as well as allowing 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.

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.

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Advantages of assessment type

- Giving students an element of choice in assessment is always good practice as it allows them to develop their interests
- Learning how to deal with conflict within groups and understanding the different mechanisms for collaboration is important.
- 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. Being able to work in a group helps students develop related transferable skills;

Limitations of the assessment type

- A common pitfall for students included getting 'lost' in the literature surrounding their molecule. Encouraging students to focus on a few core aspects that make their molecule interesting helped them to filter through the results of their literature searches more effectively, and this approach usually led to a clearer presentation telling the 'story' of the relevant molecule.
- Student also needed reminding that the example poster they were given is just an example, not a structure that they must stick to if it does not apply to their molecule.
- As with any group presentation, it was clear where groups divided the work and stuck their individual sections together, without researching other sections and smoothing over the links. Where groups had teamwork problems, it was much easier to resolve when students spoke up early, so this should be emphasised to students when the project information is released.
- While group work helps develop a lot of useful transferable skills, the danger with group work around an artefact such as poster is that students will distribute work in such a way that each party works on a different part of the poster. This means that they are essentially working separately and missing out on developing important transferable skills such as negotiation and potentially conflict resolution.

Advice for implementation

- For assessment design more generally, it can pay off to think through alternatives at the same time as the standard assessment, to build in inclusivity from the design phase. In this case, this could have helped to standardise the vivas offered as a presentation alternative.
- It is good inclusive practice to provide access to a digital version of a poster even if the presentations take place face-to-face. This is to allow access for people who might struggle with the printed design. Having an online version extends participation to all who want to be included.
- Using accessibility tools to check the posters for any inclusivity issues to ensure it is readable to people with a visual impairment. This would include ensuring that the posters can be accessed via a screen reader and that visual images have appropriate tags.
- Ensure that preparing students to work in groups effectively is part of your preparation for the assessment. This video outlines some strategies that can help you with that. Also this case study contains some examples of activities that you could use to help students work together better;
- Include inclusivity considerations when it comes to group working, for example include and explicit discussion of how specific learning difficulties could affect group work to help students develop empathy towards those with different working patterns and styles;
- Ensure there are opportunities for alternative approaches to demonstrating assessment criteria for students with disabilities;
- 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.
- Peer review / assessment of exemplars could be an effective means of formative assessment and / or preparation / helping to manage students' anxieties relating to approaching assessments. In cases where using examples of past student work is inappropriate, developing some 'sample' exemplars which could be used as a review exercise so that the students get a better idea of what 'good' performance looks like.

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