

Does peer and self assessment add value to, and enliven, a poster session following a practical class?

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Background and rationale

Level 2 biochemistry students in the Cardiff School of Biosciences have day-long practical classes one day a week. They engage in a number of experiments over a 4 week block of teaching which builds into an extended practical investigation of a theme, which they then write up in the form of a paper. This case study relates to one such series of experiments which investigated the quaternary structure of haemoglobin, bringing in the practical techniques of gel exclusion chromatography, protein assays, SDS-PAGE and Urea gel electrophoresis. Many of the students, particularly the weaker ones, found it hard to integrate the findings of these various investigations and draw overall conclusions. This was particularly true if one of the experiments had not gone well and was providing confusing data. They were unable to see the bigger picture, so their interpretation of the data was often poor. A poster session was introduced as part of this practical to give the students an experience of a different form of presenting data but the task also had the benefit of giving them immediate feedback on their interpretation of the data prior to them writing their extended “paper” style write-up. To engender a sense of fun, competition and hence greater interest in the activity, I started introducing the 4 week practical by telling the students that they were to imagine that they are not students in a level 2 lab, but rather a team of research scientists working in an internationally renowned laboratory on the quaternary structure of a novel protein. They suspect that other groups have found a similar protein and you want to publish your results at a forthcoming international conference and get recognised as the group that came up with the definite structure. I give each team an identity as the team from a particular country and try to always refer to them as the representatives of that country over the next 4 weeks.

‘How to do it’

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This is the first time the students have made scientific posters, so I spend some time during the 4 weeks explaining the sort of information that you would expect to find on a scientific poster at a conference and what the elements of a good poster are, without being too prescriptive. I explain that at many society meetings, e.g. Physiological Society, British Pharmacological Society; posters and presentations are assessed to see if they merit publication, and likewise their posters were going to be assessed at their conference. I point out that in many work environments, industrial or academic you are going to have to peer assess colleagues. That being able to provide critical but positive feedback to other people is an important skill that they need to practice and will need to use in their future workplace environment- whatever those may be. I then explain that they are going to peer assess each other's posters. I point out that this MUST be done in a positive way. They are not to criticise anyone else's efforts but rather I want them to think of something that was particularly good about the poster or the data and the way that it was presented, plus one way in which they think this could be improved. Each group must comment on each of the other posters AND on their own. To

establish a score, I also ask them to rank order the posters. Each group will do this for each of the posters, (as do I). I then add up the rank ordered positions of each poster and use this to assign a mark, i.e. the poster that gains the most first place positions will get the highest score etc. Thus the teams peer assess each others' work.

Within a team, however, each member will make a different level of contribution to the team. To assess this, I asked each team member to give a score rating (A to D) for each member of the team, including themselves. To encourage them to be critical and to acknowledge that different students bring different talents and contributions to a group, I ask them to assess each other under a number of different headings, such as artistic contribution, background research and understanding, quality of data, and team-working skills. This then leads to a score for each individual's contribution to the team effort.

Advice on using this approach

For this session to work well, I found it was essential that it was presented to the students in the right way. It needed to be upbeat and engender a sense of fun and competition, so the students took on their roles as country representatives and took suggestions and criticisms onboard without feeling victimised or resentful. It was also very important to explain the professional context, so they saw this as a real-life experience and understood that this was an important transferable skill not just some weird activity that I had dreamed up, that did not have a place in the "serious" business of passing grades and becoming a scientist! On one occasion, I let pressure from other teaching activities; project and PhD students cause me to rush some of these important "communication" parts of the sessions and just ran through the motions of the students doing the practical and posters without setting up the context fully. The result was a disaster, the students failed to fully engage with the activity, the posters were poor and the student feedback on the session even worse - in complete contrast to that from other groups that had been through the "full" experience.

Trouble shooting

Students find the idea of assessing friends difficult. Initially I asked them to give a single grade to their team members and to grade their contribution to the team. In some instances, usually when genuine shirkers were involved, grades genuinely reflected a team member's contribution, but on the whole contribution-grades were not very discriminating. By asking students to recognise specific skills in their peers, I found the grades became more discriminating and I would like to think it encouraged students to think about the benefits of team working and the various talents that members bring to that team (but maybe this is just me being idealistic!) Students found particular difficulty when a team member had been absent for one of the sessions for a genuine reason, such as sickness. I was usually asked for advice with scoring that individual and discussed with the students whether they thought someone should be penalised in such circumstances but I always said that it had to be their decision and that they had to take on that responsibility.

Does it work?

Yes! This was a novel activity that taught transferable and employment skills that the students did not experience anywhere else on the course. The students left the session talking about what had happened and discussions with former students have shown that they remembered the activity several years after the event. With a few limited exceptions, I would say that most found it a positive and enjoyable experience. Feedback on module questionnaires produces comments like "wish we did posters more often" and "I enjoyed this session". The use of country names for teams adds a sense of fun (with teams often getting into character with bilingual presentations, flags or other emblems depicted on the posters and even on one occasion a recorded speech by the President of the USA!) but also keeps any comments from becoming too personal. Comments are directed at a "team" not an individual and I insisted that they must be balanced, one "best point" and one thing that could be improved. The activity did not do away with the formal written assessment component but lowered the emphasis placed on this, as the posters and peer/self assessment marks also contributed to the overall grade awarded. Thus a variety of skills were assessed and weak students given immediate feedback and guidance on how to improve their written assessment.