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Experiences in Bio389 in 2013-14

One of the key enablers for my exploration of flipped classroom was actually lecture capture. We've been using Panopto to record lectures for a number of years and the fact that I had modules' worth of recorded lecture content available to me opened up new possibilities. Why not send the existing lecture recordings to my students in advance and then use the time I would've spent delivering the lecture to do something more interactive like hold a discussion, run a quiz or encourage group work? I adopted this model for a number of courses where I felt that the 'core' content was actually better delivered via a recording which the student could review and replay, learning at their own pace. Most recently, I've used this approach for a final year module where my section was on adaptations of plants to climate change.

It became clear to me very early that, as with any assessment, there is a need to link the flipped classroom content to the final assessment. This needs to be transparent to the students who are naturally concerned about a 'good' degree and the final exams that they perceive are central to delivering this. Accordingly I presented the text of the exam question for this section of the module and subsequently revised it 'live' in lectures. The final format of the 'open' question was in fact very conventional, requiring a consideration of the wider agricultural context, a detailed analysis of the current state of scientific knowledge about a defined stress and a final evaluation of where the barriers were between exploiting the scientific knowledge to actually putting food on peoples plates. It is worth noting that there was no prescription of which stress the students could consider; the wording of the question allowed them to slot whatever specific topic they felt was the most interesting. It was clear to the students that this would be a question in the final exam. The format of the exam was two essay questions from 4 choices, answered over three hours. I highlighted to them that while they could do the seen question, they did not have to and should they opt out they still had a choice to 2 out of three unseen questions

The teaching delivery involved me sending students links to recordings for this course in previous years where I had delivered the material in a much more didactic conventional lecture manner highlighting to them that these sessions will directly relate to the pre-seen exam question. I made the contact time that would have been taken up with the lecture a more interactive session around the issues raised in the recording. I will admit that this was not planned or thought through as well as it might have been, simply providing a lecture then standing up and asking if any one had any questions did not work well. This was despite that fact that the group of 70 students included a lot who I know well and had been on residential field courses with. I was also surprised at the difficulty in getting good interaction in the lecture since I had tried to highlight the direct link to assessment through the use of the seen exam question.

The rationale of this methodology was designed to have a number of advantages. Firstly, by explicitly linking the education content to the assessment, it should give students a compelling reason to watch the recording or read the other material provided. Secondly, by freeing up the contact time for a more interactive session, students can come with their questions, comments and theories more deeply thought-out, leading to a more fruitful discussion. This aspect proved more difficult and on reflection requires more thought in subsequent iterations. Thirdly, flipping helps students to justify the knowledge they've acquired in an applied setting. This last aspect is relevant to the idea of moving away from knowledge acquisition and focuses students instead on knowledge application – this is the only way to move them from a school mind-set to a higher education mind-set and prepare them for a future beyond education.

I've found that most students do watch the recordings in advance, as in a discussion session or group work, there's nowhere to hide if the preparation hasn't been done (and the student groups tend to 'self-police' in this regard!). You'll always get the odd student who wants to sit passively and be told what to know to pass an exam. But I'm focused on how to move my students towards active, not passive learning. I want them to leave my sessions knowing how to do things, not how to know things. Once students are used to it, the majority loved it and see it as a great way to build team working and presentation skills, as I often asked students to present on their discussion work to the whole class at the end of a flipped session. However there were issues with some students not preparing and the burden then falling on those who has in the flipped session. This may or may not be a problem: if doing the work helps students do better in the final assessment that it probably is not. However the students who did the work were not happy about the freeloaders which were a negative aspect here. It also became apparent that there were at least two groups of students in the class; those who liked it and got it and those who did not. A subset of students did not like this flipping and were more comfortable being told information by the lecturer and taking this away and working it up themselves without having to rely on others, this aspect came out clearly in the MEQs.

At the end of the day the vast majority of the students attempted the seen question. The marks for this were slightly higher than the next best question on the module and it was clear to me that the depth of learning and focus on one issue allowed the best students to demonstrate higher level skills, engage with the relevant research material, show real critical appraisal and some genuine synthesis. What did I learn from my first attempt at flipping?

Recommendations from the 2013-14 experience

1. Tie your flipped classroom content very obviously to assessment, so students see the value
2. Be clear with students what you're doing, why you're doing it and how it will help them learn
3. Make sure you've got a strong plan for the face-to-face session that would've been your lecture
4. When you make the contact time more interactive you have to relax and go with the flow if students want to take things in a different direction to the one you were expecting
5. Cut your coat according to your cloth – not everything lends itself to flipping, so you've got to make the right choices depending on your available resources and your students.

Lecture flipping in Bio389 2014-15

So the this year in 2014-15 year I did flipping again. I was sensitive the valid criticism from some students that the flipped teaching had not been well organised. I also felt that the emphasis of skills vs. knowledge had not been as clear as it could be. Students value skills and in the final year are acutely sensitive to needing them for employability so if presented right this is a good selling point.

What did I do second time around?

Firstly I think I have organised it better. Knowing I was going to flip before the timetables were set I was able to get six, one hour teaching sessions spaced a week apart. In the first session I introduced the rationale of my teaching. As it was the second iteration I was able to present the current students with the views of the students who had taken the course last year along with the assessment outcomes. This enabled me to clearly highlight the rationale and reassure students that this approached would not disadvantage them (in fact the opposite) in final exams. Secondly, I gave more thought to the structure of each session and the tasks I expected to have been done. In this regard I was helped by a better understanding of the teaching platform provided by Canvas, particularly using assignments and group work.

Introduction: January 15th 2015

So how is it rolling out? Before the first session, indeed before the module even started, I used Canvas assignments to ask each student to read the recent UKPSF report on the status of plant science research in the UK. The report, *UK Plant Science: Current status and future challenges* revealed that the UK's position as a world leader in plant science is under threat from a shortage of funding and a lack of stable investment in essential skills. It laid actions needed to ensure the UK can respond to significant global challenges such as guaranteeing food security, coping with the threats from climate change, protecting biodiversity and improving human health.

Via canvas students were asked to:

1. Read the UKPSF report
2. Complete a proforma designed to help them pick out the main issues
3. Upload their proforma to Canvas

Using the peer review tool on Canvas they were then asked to review two other proformas and on the basis of those and their own submission list the top 5 stressors of plants. I then summarised their rankings and posted the results of Canvas. They were informed that the class top 5 stresses will form the basis of the subsequent teaching session in this section. Designing this section of the module in this way was intended to get them to engage with the wider context of the relevant sciences. The proforma gave them focus; while relatively experienced, final year students still benefit from some guidance, the peer review of other work allowed them some opportunity for self reflection while direction via Canvas gave a simple way to manage the class between the face to face meetings. I then compiled a list of

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the top stresses as scored by them and posted this on Canvas, indicating that these would now form the basis of the next five teaching sessions. Getting them to rank the stresses in this way gave them ownership of the material, after all they had chosen it, and gave a forward looking structure to the teaching sessions which perhaps had been missing in the 2013-14 version of the module.

Now we had the justification of this section and the stresses that will form the basis of the rest of the module. Both of these had been defined by the students from a general set of parameters provided by me as the leader of this section. I hope this provided a supportive but open ended context in which the rest of this part of the module could take place

Session 1, pests and diseases: 30th January 2015; Work in advance

The first topic, as chosen by the students was pest and diseases. I was keen to avoid the lack of organisation and structure that was an issue with the previous version of the module. To set work up in advance I now used the group section of Canvas. I divided the topic of pests and diseases up into 11 sub-topics. Having set up 11 groups on Canvas I allocated each group one of the topics. They were sent the following instructions:

Pests and diseases of plants can be interpreted in a number of ways. Vertebrates, invertebrates, bacteria, fungi, viruses and other plants can all have detrimental effects on plants. Plants can react and defend themselves in a number of ways, some are potentially common to all pathogens while others currently considered to be specific.

- 1) Induced and non-induced defence
 - 2) Direct and indirect defence
 - 3) R proteins
 - 4) PAMPs
 - 5) Elicitation of defence
 - 6) Jasmonate and Salicylic acid
 - 7) Proteinase inhibitors
 - 8) Volatiles and plant defence
 - 9) Integrated Pest Management
 - 10) Signalling and plant defence
 - 11) Transcriptomics as a tool to understand interactions
- You have been allocated a group and a topic on Canvas and you should be able to collaborate online.
 - Please communicate with the group and agree a consensus for your topic report. For your allocated topic each group should summarise in a one page document report using the headings listed below.
 - There is some reading on Canvas to get you started and some second year lectures on the subject that are a good starting point but these are not in any sense definitive.
 - Give the document a title reflecting the allocated topic.

- There will be an opportunity to comment on the topic of one of your peer groups and to get comments on yours from another group.
- We will consider the reports in the class session on Friday 30th January.

Report format (one page only)

1. Topic area
2. Definitions of the relevant terms
3. Examples
4. How far are we from exploiting your topic to improve crops, where are the barriers?
5. Write one MCQ question with 4 potential answers about an aspect of your topic

I was able to get most of the reports the night before the face to face teaching session. Some had not been loaded up but I think this turned out to be lack of familiarity with the canvas site and some issues with group working. These can always be a problem but in the present case I felt that it was not a major issue as the work was formative. I will have to keep an eye of who does and does not engage with the group work in future exercises. Some students take on the bulk of the work while others free-load. This is an issue for those who feel annoyed by the free loaders but in this type of exercise I think the assessment will ultimately find out those who did not engage well, indeed anecdotal conversations with some students who had engaged backed up this pragmatic view.

Session 1: A mind map of Pest and diseases. 30th January 2015, Face to Face :

In preparation for the face to face session I stripped out the student generated MCQs and converted them into a turning point quiz. My intention was to use these to break up the session with an interactive quiz using the new response ware which would allow students to use iPhones etc as clickers. Before the session I had standardised font etc of the student submissions and compiled them into a single PDF which was uploaded on the relevant section of Canvas. I had printed these out and brought them to the session. I had also prepared a short power point to introduce some of the session. After talking a little about the exam question) I briefly gave them an overview of plant responses to pests and diseases.

Having presented each group with a sub-component of the main topic and got them to do some detailed work in preparation I now needed to get them to pull it all back together to see the whole picture in the face-to-face session. I had thought of doing this as a mind map with students coming down to the front of the lecture theatre and sketching their contribution on to a mind map on the boards at the front of the class. I thought that since the preparatory work had (largely) been done and that these were third year with whom I had a reasonable relationship this would be straight forward. However it proved surprisingly

difficult to get students to come down to the front to sketch their component and its relationship to the other parts. After much cajoling and some tumble weed moments we managed to get some representation of the whole picture on the boards. I subsequently photographed these and put them up on the Canvas site. However I was disappointed with the level of interaction which, given the time I had taken to prepare the session and the work done by the students, I thought would have been better.

The second half of the session used the MCQs that the groups had written as a formative class quiz using the Responseware to allow them to use iPhones as clickers. These student generated questions generally worked OK as clickers, although the questions were uneven in their difficulty and it was obviously tricky for students to know the details of subject areas they had not directly prepared for. Overall though the clickers seemed to be well received.

I finished this session by talking about what I expected for the next face to face lecture. They knew the topic was drought. Picking up on what I had done so far and the feedback I had got, I was keen that the session would be different, that it would explicitly deliver a different identifiable study skills and that it would not take up too much time. The time issue had come up in conversation with students and from my own reflection that each session was only one lectures worth; how much could a student be reasonably expected to do? However, effectively what I was doing was explicitly guiding them through the 'independent work' that we normally expect but offer little in the way of guidance on, on that basis I consider that the tasks I'm asking them to do are not unreasonable. So far that seems to be the view of the students.

Student perceptions of the session

I managed to catch a few students after the session and asked them what they thought the issue was. It was interesting that they said that the lack of interaction had been because that were unaware in advance that they would be expected to come to the front. They said that if they had known they would have been better prepared and would have been more likely to engage. This seems important goes back to the previous point that we can overestimate the skills of final year students and that creating a face to face session where they are absolutely clear about what that are expected to do in advance is paramount. It is clear that the message was not getting through to all as I got this message from a student via email

'I am worried about the amount I learnt over the hour and the work prior to the session and was wondering if it was possible for you to email me copies of lecture slides from previous years that you have used in this module to help my understanding'

I reassured the student that the PDF of the student reports were available on Canvas along with two recordings relevant second year lecture to provide e background. The student had not found this material, again emphasising that absolute clarity is extremely important. It is interesting that I have had very few questions and no student led discussion on the relevant sections of Canvas. Either the students are not concerned, don't know where the lines of communication are or everything is fine!

Writing the exam question

Since we were beginning the first of the 'proper' teaching session I felt that at this stage it was necessary to remind students of developing the seen question. I presented them with a generic structure of an exam question in three parts:

1. Context from UKPSF report. The background and landscape,
2. Core question: the science: Which crops? Which stress? What do we know? What do we need to know?
3. Impact: Where are the pinches in the pipeline? What are the prospects? How can we make the information in 2 actually make a difference?

I talked them through this, reiterating some of the points about the seen question and highlighting that this draft was in fact the generic model for any exam question which they should, bear in mind when a answering question from any module. It occurred to me that by teaching in this way I was in fact delivering a set of general study skills that are useful in other parts of this module and in modules on completely different subjects. I pointed this out to them and reminded them that the skills they would gain from engaging in this part of the module would therefore be useful whether they decide to do the seen question or not. It also occurred to me that I could design and possible present this section of flipped teaching as a skills session rather than a straight delivery of knowledge. I decided to bear this in mind for the subsequent part of the module that I am responsible for.

They were now asked to draft an exam question to submit to Canvas. I indicated that once submitted it would be seen and commented on by one of their peers (and they would comment on someone else's question). They were asked to base their question on the three points listed above. I told them that I would present a selection of question to the class in the next face to face session and discuss this further.

I down loaded the exam questions the night before the next session. I read thought them all and selected some examples based on topic (e.g. some were subject specific and some general) and also those which I felt highlighted important aspects of exam structure. It became my intention to show them these questions at the start of the face to face session and try and elicit a short discussion about the main features of the structure. It is currently my intention to then give them one student drafted question and ask all of them to refine

the text of this one in their groups. The question chosen is reasonably structured and is general, thus not restricting students to a particular topic. This should produce 11 very similar texts that I can then finalise the next week.

The comment below came from a student not on the module. However this issue has previously come up at LTC and from the external examiners. We have altered the marking criteria to better suit a seen question. This student had clearly not been aware of this. In any case the previous years examination data showed a slight but statistically insignificant improvement in performance on the seen question.

'It has been brought to my attention that some lecturers who are participating in reverse lecturing- which is a brilliant technique that more lecturers should adopt- are setting their students the task of writing an exam question which they will then get the chance to vote on and will appear in the exam paper. I think this is an excellent idea however as there is only one module doing this it gives that module a massive advantage over others as students will know one of their exam questions before the exam. This approach should either be implemented into every module or scrapped completely'

Session 2: A 'Journal Club' on Drought. 6th February 2016, Work in advance

For the second Face-to-Face session students were again asked to work in groups. I left them in the same randomly allocated groups as for the first session as I was aware that some of them had set up communication outside of canvas (e.g. Face book) and I didn't want to disrupt that.

The students were reminded that the next topic was drought and that they would work in the same groups as for pests and diseases. The deadline for the exercise was set as the evening before the face to face session to give me time to pull their contributions together to lead the session the next day. They were instructed as below:

1. Each individual group member should independently identify a research paper that they think is relevant to 'test tube to plate' in regards to drought stress of plants.
2. The group should discuss/vote for the 'best' paper.
3. The group should be able to articulate why this paper is the 'best'.
1. Each group should upload the title and abstract of their chosen paper along with one line justifying its importance.
4. Papers will be discussed 'journal club style' in the face to face session
5. These papers form the basis of potential outside reading in final exams and will be made available to all on Canvas

This was as much as I was going to say but in the light of the experience of the first session I subsequently sent an additional announcement via Canvas clearly outlining that each group will be expected to comment in the session but that no one will be expected to come to the front. It was also emphasised that the 11 papers that would be the produce of this exercise represented a set of material that was outside reading should they decide to pursue this topic. If they did not the exercise provided training in developing skills in finding triaging and justifying outside reading that they are slow using in their projects and other modules

The night before the drought session I downloaded the exam question suggestions and the group papers. Some had not done so by the deadline. I'm not sure how to deal with this but at present I don't want to make too much of it as firstly I feel that would set up 'us and them barrier' with the students which is what I'm explicitly trying to avoid and secondly its my view that if they don't take part they don't benefit. Obviously I have to be careful that non contribution by one student doesn't affect the others but at present this seems to be a small component.

I read through all the submitted abstracts of the papers and sorted them on the basis of how far along the 'test tube to plate' pipeline I felt it fell. I provided a diagram of my interpretation that I will show them in tomorrow's session. After a further discussion of the exam question draft I intend to ask each group to verbal say where the paper fits in the sequence and to suggest what single factor would enable them to move it further towards the 'plate' end of the pipeline. After last weeks silence I am not sure how interactive they will be but I hope that the spur of the exam question and the clearer instruction about what would be happening in the session may help to engage them better. I also intend to have the slides from the second year Panopto recordings that were provided on Canvas so I can highlight these supporting materials to any who have missed them.

Session 2: A 'Journal Club' on Drought, 6th February 2016; Face to Face

Exam question. I had selected a series of the exam questions submitted by the students on canvas. These were chosen on the basis of subject specificity or being general. I presented these to the class and talked through them. I then explained that I had chosen a general one as the best, showing them the text. I indicated that the wording was rough and needed work and that the text was on Google docs and asked them all to begin to edit the draft of what would become the final seen question.

In the session I then gave a stripped down version of two second year drought lectures. These had been available the week in advance on the Canvas site but it was not clear how many of them would have looked at it. This took around 20 minutes. Comments afterwards indicated that they felt this was helpful but I worry that this represents a return to didactic teaching and give an escape route for those who had not done the preparatory work.

I then drew the 'test tube to plate pipeline' diagram on the black board. I had the abstracts of the papers and the students comments in front of me so could direct things and react. I had previously said that I would not be asking individuals to come to front as they had not liked this in previous sessions. Shout outs allowed me to add their papers along the continuum, saying where they thought it fitted. Most were near the research end. It was useful to highlight this and them to ask they to consider what they would need to do to

move their paper away from the research end towards the food on a plate end. This was successful with some good suggestions after a 5 minute chat in groups. In essence this is what they have to do the developing exam question and represent the sort of critical analysis of the literature that they should be doing generally in all modules. I made this explicit to them. I also showed them my slide of the triage of their paper selections and explain my rationale when there were any differences between my analysis and theirs.

I summarised and said that the summary of their selected papers would be on Canvas and represented a resource of outside reading should they need it for any exam answers. I finished by indicating that the next session would be on CO₂ and that reading and lecture recordings would be on Canvas over the weekend.

Session 3: CO₂ , 12th February 2016; Work in advance

Student instructions for the session were put on Canvas: 'The Session on the 12th February will focus on elevated CO₂, This may be the stress you choose to focus on the seen exam question. Professor Rob Mackenzie director of the Birmingham Institute of Forest Research (BiFoR) will give a 20 minute talk of the FACE experiment being set up by the university. We will then have a class discussion on FACE and elevated CO₂.

Before the session you should be familiar with what we mean by FACE, the interaction between water availability, nitrogen availability and elevated CO₂. I have put up 4 relevant papers and links below. I will expect that you have looked at this before the session next Thursday.'

Session 3: CO₂ , 12th February 2016; Face to Face

I started the session by taking the draft seen exam question from Google docs. I highlighted the 'cassette' parts of the question where they could drop in different topics depending on their interests. This also flagged up the structure of an exam question generally, something that I kept coming back it as one of the skills this part of the course was attempting to deliver. I then showed a third version of the draft question in which the highlighted 'cassettes' were replaced with specifics that made the question directly relevant to elevated CO₂. This then formed the introduction to Rob's talk on FACE

Rob's talk covered a range of issues relevant to elevated CO₂ including nutrient cycling climate change generally and the integration of different stresses making the useful point that a reductionist approach is not the only one and that multiple stresses can occur synergistically. This was an important point both specifically but also general for the rest of the module. Rob attempted to get the students to engage with frequent relevant questions to the audience, but as they seem to have been throughout, the group were tacit, even on

simple questions. I have no idea why this is as they had been (or should have been) well prepared for the subject. This is a worrying aspect of this cohort. Perhaps we need to structure discussions differently?

At the end of Rob's talks we returned to the CO₂ specific version of the exam question and there was a short but useful discussion of whether trees could be included as a crop within the current wording of the question (probably yes) and whether the wider issue of the natural environment as a resource could be included (probably not in the present wording but they were asked to consider how the generic question could be reworded to incorporate this aspect and to edit the question of Google docs accordingly). I indicated at the end of the session that the next topic would be temperature

Mid Programme Questionnaires (MPQ)

At this point of the module the MPQ went out to all students. There were few comments of the course specifically but one anonymous free-hand comment highlights the problems that some students have with this module:

In my module "Adaptation to Changing Environments", Dr Pritchard is doing "flipped" sessions, concentrating on formative tasks given throughout the week but no proper lectures. I feel I am not learning nearly as much from this as a result and the sessions do not seem to be working well, with many other students in the class commenting the same. The tasks to complete before each lecture are extremely time-consuming and simply an extra burden within an already very busy year. Independent study should be our choice as students and it should not be forced on us.

There are a number of issues with this comment. The 'not learning' comment highlights that some students are fixated on knowledge as the currency, not skills. This ties into student motivations: they want a good degree and see that as solely the final mark. I had hoped that the emphasis on the skills that are delivered and the direct link to employability would have defused this argument, clearly it has not done so for all students. This may be a presentation issue, although I felt I had work hard on this aspect, or it may represent a diversity in the learning needs of the student body that can not therefore be solved - one size does not fit all. A related point is that this student does not see that the advance tasks are directed independent work that are in fact helping with what they should be doing anyway. The generic nature of this, in that it would help with other parts of the module and indeed with study in different modules, does not seem to have got through.

Talking to some of the students it's clear that they do not always engage with the set material, it's low down their priority list, perhaps because it's not summatively assessed. Again the integration of this material with the overall aims of the module does not seem to be working well. With this cohort the flipped sessions are hard work and the students

difficult to engage. This may be due to the fact they haven't done the work, because the physical space (usually lecture room), are not fit for purpose, or because the activities of the flipped session are not very engaging.

Session 4: Temperature, 27th February; Work in advance

Reflecting on the anecdotal feedback I'm slightly disillusioned. Accordingly I've decided to make the next session on temperature more structured with less need for preparation. The students were told that the session will focus on Temperature, and that the main effects of chilling freezing and high temperatures would be summarised in a short lecture. I indicated that the seen exam question would be considered as to how it might be addressed if temperature was chosen as the stress. Some reading (three paper research papers) were posted. Panopto recordings of second year temperature lectures were made available.

Session 4: Temperature, 27th February; Face to Face

In the session I gave the cut down temperature lecture pulling out the major points. A handout was provided. I then showed the current state of the exam question and we discussed how that might be answered if temperature was the stress chosen. I then led a class discussion on one of the papers. This paper examined the latitudinal gradient of response to temperature of different ecotypes of *Arabidopsis*. It presented data identifying the different conditions at low and high altitude and matched the reproductive and vegetative characteristics of the plants to these environments. This was led by myself but no real discussion emerged. In the light of previous resistance of the class to talking at the front I tried to pull together responses on the board. This worked well although the lack of prior reading by the class made it more difficult than it should have been. I felt that the message from the analysis of this paper were useful in highlighting a more ecological analysis, highlighting that plant life history strategies might complicate attempts to modify crop yield and that there are potential genetic resources in crop wild relatives.

Final session summing up. 12th March 2015; work in advance

It was over a week before the next session and due to the in-course assessment hand in and the lack of engagement with preparatory work I felt it was not appropriate to set and advance work. Following from conversations with a few students I decided that a summary of both the skills delivered and the basic knowledge base I expected might be appropriate. Accordingly I prepared a power point presentation revisiting the rationale of this part of the module and presenting the nearly final exam question. I propose to have a short discussion about this at the start of the session. I also prepared a number of turnignpoint MCQ questions picking up some basic point form each of the topics we dealt with. I had not booked the clickers as I had decided to do this relatively late so planned to use the Response ware.

Final session summing up. 12th March 2015; Face to Face

The session went relatively well. I reiterated the aims of this way this part of the module was delivered, highlighting both the process and the study skills we felt it provided. I went over what we had done over the module and reminded them where the material was, some of which they had produced. I then put up the current version of the question for Google docs and there was a short discussion about it's current form. I then used the Responseware clickers to got through some simple MCQs designed to indicate some of the knowledge that would be required if they decided to do the question. Some of the MCQs required a more subjective interpretation and so allowed me to indicate some areas that might be helpful in answering the question, in particular making sure knowledge was applied in a crop and climate relevant context. At the end a few students asked some further questions about the grant applications and the session ended.

It will be interesting to see how the students react to this part of the module in the Module Evaluation and also how they do in the final exam, indeed how many of them actually do the question. After talking to Scott Hayward (the MO) I thought it would also be interesting to put this document up on Canvas and see if the students have any reaction to seeing the teaching process from the staff side.