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Teaching & Learning Guidance in the School of Physics & Astronomy
PART 4: Guidance for delivering small group teaching/tutoring

4A. The contexts in which you may encounter small group teaching/tutoring

4A.1 "Supervision" sessions

The School of Physics and Astronomy runs "Supervision" sessions for all of our students in the core classes from levels 2 and above. The formats of these sessions, and indeed their frequency, depends very much on the level and course that you are assigned to as a supervisor. There are some general commonalities though.

Supervision sessions see staff assigned a small number of students. In some cases, these will be pre-split into groups of ~5-6, whilst in other cases you will be assigned a larger number and it will be left up to you to determine how best to sub-divide them, or indeed whether to work with them as one larger group.

The purpose of these sessions is to provide the students with the change to revise the material they have met in lecture courses – as a supervisor you are not responsible for teaching that new material, rather to help them consolidate it.

The scheduling of the individual sessions is usually left to the supervisor. This can sometimes be tricky, as you need to coordinate the timetables of multiple students with your own availability. If you are familiar with MyCampus, you can find out the details of a student's timetable there (although that won't tell you if they have part-time job commitments), however you might find it simpler to simply offer your students a series of times that *you* can manage, and see if there is one that suits everyone.

4A.2 Tutorial sessions

As with the supervision sessions, the details of these vary from level to level and class to class. Some can be whole-class in size, others small group sessions. Some are compulsory, some voluntary.

Their purpose is the same as the supervisions though – to help students get to grips with the material taught in lectures. These sessions are typically scheduled by class or lab heads.

4A.3 Work to cover in these sessions

Most courses come with example/question sheets, either drawn from a textbook or created by the course lecturer. These are often the source of the material chosen to be covered as a tutorial/supervision.

All such sheets should come with worked solutions, though you should try to avoid relying on these. It is best to try to find the time to work through the material yourself ahead of time. Partly this is because there are often mistakes in the formal solutions, but it may also help you determine where the students are most likely to struggle. This will allow you to begin planning how to structure your session.

4A.4 Structure of your sessions

For tutorials this will likely be set by the class head, but when it comes to Supervisions, you are typically given the freedom to structure the sessions yourself. There is no right or wrong way to do this. Sessions could be run in a highly structured manner, run utterly free-form, or somewhere in between. There are advantages and disadvantages to all, and your own teaching style will likely determine which works best for you and your students.

An example of a highly structured approach would be to set homework questions for the students to attempt. You could then spend the sessions working through the solutions. If you ask them to submit work before the session itself, you would have the chance to see which areas were causing them problems, and focus on those.

The advantages here are that you retain control of the session and you guarantee that you will get through the material. The disadvantages are that the sessions can become tedious, and offer the students little opportunity to lead discussions.

A free-form approach would be to simply wait till the session then ask the students what they are worrying about. This could lead to some lively debates and discussions; equally, though, it could lead to a lot of silence. It really depends on the personalities of the students and you.

4B. How to be an effective tutor in a small group setting[1]

4B.1 Characteristics of an effective tutor

Organisation

- Is well prepared
- Arrives on time

Clarity

- Explains thing clearly
- Makes difficult topics easier to understand
- Uses examples, analogies, metaphors, and alternative ways of explaining
- Makes the outcomes of the class and course clear

Knowledge and understanding

- Has a sound understanding of the material
- Gives the student a greater understanding of the course and the field
- Admits what they don't know

Dynamism and enthusiasm

- Is enthusiastic about the subject
- Is enthusiastic about teaching
- Inspires confidence in the students they teach

Tutor-group Interaction

- Can stimulate, direct, and pace interaction with the class
- Encourages independent thought and accepts criticism
- Is an effective communicator
- Can monitor whether the class is following the material
- Is sensitive to students' motivation
- Cares about the quality of their own teaching

[1] Developed with Jane MacKenzie, Learning and Teaching Centre (now known as LEADS), University of Glasgow

Tutor-Individual Student Interaction

- Treats all students fairly and equitably
- Gives a mix of positive and developmental feedback
- Is seen as approachable and a valuable source of advice

4B.2 Facilitating a learning session

(Adapted from Goodall and Elvidge (1999) The Teaching Assistant in the Laboratory: Developing Postgraduates' Teaching Skills in the Sciences, University of East Anglia)

You will have to make judgements about when, where and how to intervene in any small group learning session. There are, broadly, 4 stages in the process of facilitating any learning session: *briefing tasks*, *helping students solve problems*, *giving explanations* and *monitoring progress*.

3B.2.1 Briefing the task

- Describe briefly what is to be done.

The task should always be written down. It is a better guarantee of clarity and consistency and it allows students to check each stage. Give the students enough time to read through the instructions properly. Don't talk while they are reading because they won't hear what you say.

- Explain the purpose

What is the purpose of the activity? How does it link to what has gone before or what will come up in future sessions? This is important in terms of provoking and maintaining interest and motivation.

- How much time is allowed for the activity?

Tell the students how much time they have for the task. Discuss with them how long each stage might take. This is especially important if the work is to be spread over a number of sessions.

- Check understanding

Make sure the students understand the task. Think about how you phrase questions. The question, 'Is that OK?' or 'Is that clear?' cues the answer 'Yes' and that might not be true. Try 'Is there anything you don't understand?' or 'Is there anything I need to make clearer?'

- What happens next?

Is there an assignment to be done, or a report or essay to be written? What is required? When is the deadline? When will the work be returned?

4B.2.2 Helping students solve problems

As a tutor your role in supporting students' learning will be different depending on the activity in which the students are engaged. One of the most important responsibilities will be to help students when they get stuck or encounter a problem. Ideally you should aim to provide sufficient support to enable the students to solve the problem themselves rather than solving it for them. By listening actively and choosing your questions with care you can help your students to develop their own solutions. Below are the main ingredients in the process.

- How to intervene

Students may ask for help or you may become aware that there is a problem from the behaviour of the group. Make it easy for students to admit they are in difficulties. Think about your opening question. Try 'Is there anything I can do to help?'

- Clarifying the problem

Use a mixture of open questions, reflective questions (questions which encourage the student to develop a line of thought further) and closed questions (questions used to check facts).

- Listen carefully and check your own understanding

Questions which summarise what the student has said:

'Are you saying that..?'

'Do you mean that... ?'

- Looking for solutions

Clarify any basic misunderstandings:

'If you go back to the worksheet what does it say in section 2...?'

Remember to give plenty of encouragement and praise for what they have achieved.

4B.2.3 Giving explanations

As part of your role in supporting students' learning you will find yourself being asked questions which seem to demand an explanation.

There are different types of explanation:

- what happens (facts and interpretation)
- how it happens (description)
- why it happens (reasons).

The ingredients of a good explanation are:

- clear context and purpose
- the explanation has a logical structure
- it is appropriate i.e. not too long or complex
- interesting - uses examples, visual aids, personal experience.

When you can't give an explanation:

- There will also be occasions when you are asked for explanations that you cannot give. This seems to be the nightmare scenario for many teachers. However tempting it is to try to appear the expert, do not bluff your way out. Tell your students that you do not know and either tell them that you will find out or suggest how they might find out for themselves

4B.2.4 Monitoring progress

If students are not progressing satisfactorily you need to establish why before you can intervene successfully. Start by finding out what is preventing the group, or individuals within the group, from progressing satisfactorily with the task?

- *Is there a lack of understanding about the required task?*

Perhaps you need to brief them more fully.

- *Are they disinterested or bored in the current task?*

Perhaps you need to make the point of the current task clearer in terms of the whole topic or course.

- *Have they gone off at a useful tangent?*

Perhaps it is worth pursuing this tangent for a while before steering the group back to the task in hand.

- *Is the task too demanding?*

Can you negotiate breaking the task down into smaller pieces?

Supporting learning does not mean intervening only when a problem arises nor does it mean taking over completely. If a group appears to be getting on with a task or project perfectly well it is still important to monitor their progress from time to time. It shows you are interested, gives them a chance to clarify any questions, to raise issues and share their success. Don't forget to praise their efforts and achievements.

4B.3 Questioning skills – different questions/prompts for different purposes

4B.3.1 For gathering Information

- Open questions, e.g.

  'Tell me about ……..'

  'Could you describe what you think about ….?'

- Probing questions, e.g.

  'Explain why you think this is a properly controlled experiment'

  'What do you mean by ….?'

- Closed questions e.g.

  'How long did it take ?'

  'Did you attempt question 3?'

4B.3.2 To make sure you've understood

- Clarifying questions e.g.

  'Are you telling me that you think this is the equation we should use……..?'

  'And do you think that ……..?'

4B.3.3 To aid problem solving

- Encouraging comparison e.g.

  'What are the relative merits of method A versus method B…?'

- Hypothetical questions e.g.

  'What would you do about if …..?'

  'In what way would you approach this problem if we use this coefficient?'

It can be useful to identify potentially difficult questions/concepts in advance of facilitating a session and design a handful of questions you might use to guide students to solve their own problems.