

Tutorial and Small Group Teaching

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Introduction

When we teach a subject we hope that students will gain information, acquire experimental skills, learn how to plan experiments and interpret data, become adept at problem-solving, and develop a wider vision so that they can generalize about an area of knowledge. The ways in which we teach usually include lectures, practical classes and/or 'dry labs', and tutorials or seminars. In addition, we may use audio-tutorials and computer-assisted instruction, and we will certainly expect the students to study independently from textbooks, published papers and reviews.

Much has been written about the aims of lectures, but there are doubts, frequently expressed, that lectures are not very effective as instruments of either long-term or short-term learning. Nevertheless lectures remain, and are likely to remain, a major instrument in our teaching for a variety of reasons, not all of them good ones. Many of us use tutorial teaching to 'correct' students misconceptions that result from misunderstanding lectures or textbooks.

Laboratory work is seen to be very important for developing practical skills including gaining experience in collecting and recording results and their subsequent interpretation. Many laboratory experiments are justified on the basis that they illustrate or reinforce the content of the lectures, although a number of commentators have mentioned that what little evidence there is refutes this contention.¹ Many of us use small-group teaching at the end of a practical class to draw together results and make interpretations.

So, two of our major teaching methods rely, at least to some extent, on supplementary, small-group teaching for correction, correlation and interpretation. I would like to examine the aims of small-group teaching more broadly, and suggest some additional benefits that are not easily brought

about by other teaching methods. In any case, since many of us use tutorial teaching, which is labourintensive, we should at least try to have clear aims and use the method efficiently. For those of us who do not already use tutorials as part of their teaching, I would like to try to point out some of their advantages and encourage their use.

Small-group teaching

Tutorials are a form of small-group teaching.² By small-group I mean ideally not more than 10 students per instructor, and preferably less, although there are ways of dealing with larger numbers. At the extreme is the tutorial system used in Oxford and Cambridge Universities in which the student periodically meets privately with a tutor. Such a system has great potential for effective teaching, but it is also the most labour intensive in terms of tutor's time. In many places and in a climate of forced economies, the staff:student ratio makes individual tutorials physically impossible. Therefore we are left with some sort of compromise and here again it is important that we should define our aims and achieve the best that we can for our labours. This includes setting out our objectives, understanding how groups work, and ensuring that both staff and students are suitably prepared for the tutorial. Tutorial teaching is rewarding, but useful discussion in a group will not just happen by itself: the tutor needs to control what happens, to manage the group, and be prepared to deal with problems.

Aims of Small-group teaching

The objectives of small-group teaching need to be set out clearly.³ Sometimes groups deal with questions and problems that have arisen in lectures, but it is important that both tutor and students are adequately prepared. There should be direction to the discussion. For example, the tutor should not use the time for a 'mini-lecture' and the students should not expect a replay of what they heard - or only partly - in a lecture.

Often group discusses a prepared topic, or a scientific paper, or the laboratory work they have just completed. Sometimes groups solve problems, in a variety of ways, individually, or cooperatively, with the tutor participating in the most appropriate way.

In general, it is important to the intellectual development of students to experience full participation in a free discussion. In this situation, students have equal rights, learn from each other as well as from the tutor, and make their own judgments. We hope that they will develop critical thinking ability and the capacity to integrate ideas, make deductions and draw conclusions. Their development in this way generates confidence so that ultimately they will start to make a contribution to the discipline. We can summarise: this process of development extends from raw information through digestion, correction and correlation to the establishment of confidence and eventually contribution. Neither lectures nor laboratories nor private study, can easily promote this process of development, although they contribute to it: tutorial discussion can.

A good deal of the success of a group for its members depends on the individual feeling comfortable. At the simplest level this means being able to ask questions without feeling foolish. So, we should recognize that groups have a *social* function, especially for new students, whereby the students can have social contact with their peers and teachers. They can resolve the difficulties in psychologically comfortable surroundings. Groups also have an *educational* function in terms of the development of higher level skills such as listening, speaking, arguing, group leadership, etc. As well as helping their understanding of their subject, these are important professional skills which will be required of them in the future in their professional life, in committees, at learned society meetings and so on.

How groups function

An important characteristics of small group teaching is that there should be active participation by all. This difficult to achieve at first, and is the more difficult if the students are unprepared, ie have nothing to talk about. (We always give them both written work and something to prepare and to be prepared to talk about.) Active participation implies small group size, preferably 5-8 students. Alternatively, there are possibilities of dividing into sub-groups who might, for example, discuss a topic and then report back, via a spokesperson, in the main group.

A second practical point is that groups should be organized so that there is face-to-face contact. So the best arrangement is a circle. A lecture room, with rows, is unsatisfactory, and so is a long table. This also results in the tutor being one of the circle, rather than being identifiable as a supervisor. This, too, has the effect of making the students more comfortable.

Most importantly, the group should undertake purposeful activity. Discussion should be purposeful and develop in an orderly way, not be just idle chit-chat. This is essential for the development of the skills already mentioned - listening, speaking, arguing, etc. - and it requires skillful but discreet control by the tutor. There should not be a need for constant intervention by the tutor, and tutors should avoid satisfying their own desires to be deferred to as the teacher and expert on the subject. The tutor or group leader should encourage the students to take responsibility for initiating discussion, asking questions, providing information, asking for clarification and challenging statements. This makes great demands on the tutor to take account of student behaviour, personality and difficulties. The tutor's role should be cooperative rather than authoritarian. At outset the tutor should specify the group's task and spell out how the group should operate, what role the students are expected to play and what degree of preparation is expected.

The small group atmosphere needs maintaining. This means creating a good climate for discussion one which is open, trustful and supportive. It should not be closed, suspicious, defensive or competitive. Competition is a feature of much of education, but in the real world science is done cooperatively: people pool their knowledge and problem-solving skills.

Finally, management of a group also includes budgeting the time allowed for various discussions or tasks. Here again the group leader must exert discreet control.

Dealing with difficulties

In a lecture, one can ignore a sleeping student, but in a group the leader must try, without seeming authoritarian, to encourage everyone's interest, enthusiasm and participation. In fact, many problems can arise, and I will deal with them briefly. However, one way of dealing with problems in groups in general, is at the social level. In other words, the leader can raise the question that there seems to be a problem, for example with active participation, and ask the group operates, are they not interested in the topics for discussion (and if not, why not), what would they rather do.

Group leaders have to be sensitive both to the group and to the individuals within it. Students have a fear of exposing their ignorance in front of their teachers and their peers. The group leaders can counter these fears by making clear what is the purpose of the group or of a particular task before it, and they can be explicit about how the group members might contribute. If the students are being assessed within the group - and this is not to be recommended - then it should be made clear at the outset what criteria are being used. Fear of assessment and onsequently the introduction of competitiveness is almost bound to be inhibiting. In my view, assessment is best avoided.

Group leaders should make it clear that ignorance is relative. Indeed, teachers should be prepared to admit to their own ignorance but then go on to demonstrate and discuss appropriate ways of dealing with it: what sources, textbooks and articles to go to.

So, tutors should constantly be on the outlook for trouble and should also be aware that they may frequently be as guilty as the students in this respect. Bion has classified group responses into fight, flight, pairing and dependence.⁴ *Fight* may be recognized in the form of hostility or aggression, quibbling over semantics, point-scoring in the attempt to establish intellectual superiority. I repeat that teacher is frequently guilty of some of these. *Flight* can take the form of withdrawal, which is serious because one of the main features of successful group learning is active participation. It can also involve students avoiding difficult situations by distracting behavior or attempting to change the direction of the discussion.

Pairing results when two members of the group carry on a more or less personal conversation and all too often the teacher is one of the participants, perhaps with the the brightest, most forthcoming student. A good group will not allow this, partly by exerting social pressure and partly by all its members unselfconsciously participating in the discussion throughout the tutorial. Related to pairing and to flight, is *dependency* where the group avoids dealing with the problems by getting someone else to do it for them. frequently they await words of wisdom from the teacher but they also may get used to the brightest one or two students taking the most active part for most of the time. Teachers, of course, are susceptible to flattery and should be on their guard.

Staff training

Staff need to be prepared. This means not only that they should be familiar with the material to be discussed, which requires that they do their

homework too, but also that they should be aware of the various things I have already mentioned such as how groups work and how to deal with difficulties. They must understand that managerial input is required as well as intellectual input and that these are equally important for the successful operation of the group. As well as setting the tasks of the group, organizing the material to be prepared, budgeting the time, etc., they should be aware of possibilities for varying the format for a change or for dealing with larger groups. Possible alternative modes are *buzz* groups where the group splits up into subgroups for a few minutes and which then report back to the main group, and *brain-storming* in finding the solution to a problem. Here, wide and creative thinking is encouraged, and criticism is ruled out during the idea-generation phase. All ideas are welcomed in getting to grips with the problem and are written down. Then draws on the knowledge and skills of all the members of the group.

Most important of all, group leaders need to become aware of themselves. It has been said that for many academics, becoming a sharer in a group, rather than a dispenser of knowledge, is a new experience. They need to understand this and then be prepared to transform their roles. Some find this easier to do than others, and no doubt it is related to both age and personality. Although it is a slightly disturbing experience, having an experienced colleague sit in on the tutorial to offer, afterwards, a critical appraisal of group work, can prove to be extremely valuable.

Evaluation

I have already briefly mentioned evaluating or assessing student performance. Much more important is to evaluate the success or otherwise of small-group teaching. Most important is for teachers to reflect on their own talk: what was the quality of the contributions, was the group's purpose or task achieved? One way of assessing the success of small-group teaching is to issue a questionnaire; in other words, to undertake a formal evaluation rather than relying on hearsay. Questionnaires need careful planning or modifying someone else's questionnaire, is recommended.

Conclusion

In a recent book by Weatherall (*The Genetics and Clinical Practice*⁵) the author called attention to the need, in his opinion, for a new generation of doctor who has a foot firmly planted on both the clinical and the basic sciences. There was, he said, a need for not only education but also of *discus-*

sion of the issues involved at all levels. Of course, I am not talking here solely about the education of medical people. These skills are required by all professional scientists. The tutorial can start the process of discussion. This is important not only as a way of helping the understanding of concepts but also of taking an active and informed part in discussing the issues. This is totally different from learning something and then of reproducing it in an examination or of learning intellectual and technical skills that might conceivably be of use in future professional practice. It is start to making a contribution in science.

To summarize, I believe that we should aim to develop, in students, such mental skills as critical and analytical thinking, interpretation and deduction, as well as communication skills. Tutorial teaching and group discussion, if properly organised, must be one of our major ways of achieving these. In addition, in the sciences, there is the need to integrate different facts, see overall patterns and discern general principles. In this respect, too, small-group teaching would seem to offer the enlightened teacher outstanding opportunities. Most important of all is that a properly run tutorial will demand active involvement of all the students. Active involvement means that knowledge must

have been remembered, digested, corrected, and can now used.

It has been reported that we remember about 20% of what we hear, about 30% of what we see and hear, and 90% of what we do, that is, of what we actively participate in. Lectures and Laboratory classes obviously have their place. However, I believe that tutorial teaching, although it is the most expensive system in terms of staff time has greater potential than any other for effective teaching and for production of a fully developed individual by our educational systems.

References

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