Lectures

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http://www.economicsnetwork.ac.uk/handbook/lectures/

1 Introduction

"The first duty of a lecturer: to hand you after an hour's discourse a nugget of pure truth to wrap up between the pages of your notebooks, and keep on the mantelpiece forever." – Virginia Woolf

"College is a place where a professor's lecture notes go straight to the students' lecture notes, without passing through the brains of either" – Mark Twain

"Academic chairs are many, but wise and noble teachers are few; lecture rooms are numerous and large, but the number of young people who genuinely thirst after truth and justice is small." – Albert Einstein

"Some people talk in their sleep. Lecturers talk while other people sleep" – Albert Camus

"When I give a lecture, I accept that people look at their watches, but what I do not tolerate is when they look at it and raise it to their ear to find out if it stopped." – Marcel Archard

"Like all people who try to exhaust a subject, he exhausted his listeners." – Kingsley Amis

"The best teacher is the one who suggests rather than dogmatises, and inspires his listener with the wish to teach himself." – Edward Bulwer-Lytton

"My lecture was a complete success, but the audience was a failure." – Anon

Lectures have been employed for hundreds of years as a platform for disseminating ideas and knowledge and for guiding and motivating students, and they continue to be a cornerstone of higher education practices today. Lectures can be defined as the delivery of a course through a series of presentations by academic staff members to a group of students, usually with visual prompts and aids. The term 'lecture' can encompass a range of styles, approaches and formats that will be investigated throughout this chapter. Some of these involve considerable student participation. Traditionally, however, lectures have involved the one-way transmission of course content from academics to students.

But lectures have more than a mere dissemination role. If their intention were merely to provide the students with basic information on the course, then there would be good reason simply to abandon them and provide a competent set of notes in their place. Lectures should also motivate and challenge students and give them insights. This is elegantly summarised by a student who attended Alfred Marshall's lectures at the University of Cambridge at the turn of the century:

"He was certainly a unique teacher. He seemed to grip the mind of his hearer and force it through unaccustomed exercises, with many a violent jolt and breathless chase. He loved to puzzle and perplex you and then suddenly to dazzle you with unexpected light. 'Ages of darkness and moments of vision', was one description

of his lectures, I remember. But the vision was worth it, and was not to be appreciated without the preliminary bewilderment…. What we brought away from Marshall's lectures was certainly not any ordered knowledge of economics, not enough, as he had predicted, for passing an examination, but perhaps an awakened interest, a little more insight, the memory of some moment of illumination and a sense of the importance of economics." (As quoted in Groenewegen 1995, p.314)

This quotation captures a key potential difference between a lecture and a textbook exposition. Of course not everyone is capable of holding an audience spellbound throughout a lecture, especially when it is part of the routine of learning. Nonetheless, lectures can be used as an effective means of promoting student learning even if the lecturer is not inspirational. However, they can also be tedious and of little benefit to students. In large part, the success of a lecture depends on how engaged students are and whether it is providing an active learning environment.

This handbook chapter will investigate the costs and benefits of different types of lecture, and will suggest ways in which the traditional lecture can be improved. Although the focus of the chapter is on lecturing, it is not considered in isolation from the other teaching and learning formats that are likely to accompany and complement it.

1.1 Opportunities provided by lectures

Lectures provide key opportunities for students to learn in an efficient way about the subject they have chosen to study. The lecture will typically convey and prioritise information about the subject in a relatively condensed format. It can also enthuse students and provide a suitable framework for further study. Students are exposed, most likely for the first time, to a professional scholar who may be a researcher at the forefront of that aspect of the discipline. Lectures provide a traditional link between research and teaching. They help to preserve a culture of learning in Higher Education in which undergraduate study is viewed as an induction into an academic discipline, a way of viewing the world.

There are also clear benefits to the lecturer. Assuming that an academic is lecturing on a similar topic each year, the up-front costs of preparing a set of lectures are offset by their re-usability. Also, the traditional lecture, being teacher centred, can minimise the stress for those academics that are hesitant to relinquish control of the learning process to students.

Lectures have additional benefits for the institution. They are seen as making an efficient use of the lecturer's time, since they allow teaching to take place in classes with a very high student/staff ratio. This has become an increasingly compelling incentive when pressures on institutions in terms of research output and accountability to students and other stakeholders have grown. A greater use of

lectures, or of larger lectures, allows resources to be released to address these other issues – either by reducing lecturers' timetables or by releasing time for more small-group work, personal tutorials or online tuition.

1.2 Inherent problems with the traditional lecture

Notwithstanding the apparent benefits detailed above, newer approaches to teaching and learning, such as problem-based learning, are increasingly being introduced on the grounds that, even for an equivalent investment of staff time, the learning outcomes of students are far improved. The use of techniques that aim to generate a greater amount of student involvement is of course nothing new. Tutorials, seminars and other variations on student-centred learning have long been used to complement lectures. However, the justification for abandoning or reducing the number of lectures on a course typically focuses on two criticisms: that lectures are a poor medium, first for conveying information and second for developing student understanding.

Conveying information to students

Are lectures an efficient means of conveying information to students? According to Miller (1956), the average number of items that can be held in short-term memory is 7 (±2). Therefore, if students do not have significant time to process new information one of two things happens, either previous information is displaced or the new information is lost. Lectures which proceed quickly simply do not give students sufficient time to process information. Similarly, the ability to concentrate for an hour or so while taking adequate notes is not something that can be taken for granted. Indeed, listening and note taking can be mutually exclusive activities, especially for more inexperienced students. It cannot be assumed that an hour-long lecture will result in an equivalent sum of learning taking place within a student's head.

This problem can be compounded by the problems of a crowded curriculum. As new theories, research findings and policy initiatives emerge, space has to be found within the syllabus to accommodate them, and not always at the expense of existing content. If more and more content is crammed into a series of lectures it may encourage the lecturer to do little else but talk from the front from start to finish. The logical consequence of such practice is that the pace of lectures is forever quickening to ensure that the expanding syllabus is covered. A lecture could hardly be considered successful if it 'covered' the appropriate part of the syllabus and yet students retained little of what was said or were not guided in their private study.

Students are also more likely to remember information when it is structured in a logical fashion and if it is demonstrably meaningful to them. This again highlights

the important of context to learning. Students need to comprehend why they are being taught what they are and how they will subsequently be assessed on it.

Developing student understanding

To judge the 'success' of a lecture, it is important to identify its intended learning outcomes. Learning outcomes are often specified in module or course descriptors or handbooks. However, caution should be exercised in judging the success of a lecture against them, since these parts of the documents have often been prepared to meet university or QAA requirements, and compliance in this process by lecturing staff does not necessarily mean that the specified learning outcomes are the most appropriate or are even the ones that the lecturer would choose to identify.

In addition, whilst a lecture's success should be judged in terms of what students gain from it, it does not follow that lectures which students consider successful are necessarily good lectures. Students may prefer lectures that allow them to take notes which can be used directly in preparing for examinations or other forms of assessment. If their objective is to maximise marks subject to a time constraint, or to minimise time commitment subject to achieving a target mark, then this will almost certainly be the case. Similarly, a lecture might be very entertaining, and for that reason popular with students, and yet be a poor learning medium for students. Students are also likely to show a preference for the teaching format they are familiar with, as is equally the case with lecturers.

Assessment is clearly an indicator of student learning and hence of the success of lectures. But even if it were possible to separate the contribution of lectures from other learning media to assessment performance, the assessment itself may not capture the extent to which students have acquired and developed an understanding of the subject matter. To gauge this it is necessary to consider a theory of learning first developed by Marton and Säljö (1976a, 1976b) and since elaborated by Ramsden (1992), Biggs (1987, 1993) and Entwistle (1981). In these studies an important distinction is made between surface, strategic and deep learners. Surface learners are characterised as focusing on memorising words, formulae and theories rather than building relationships and connections. Surface learning is encouraged by:

- A heavy workload;
- An excessive amount of course material;
- A lack of independence;
- Assessment methods that emphasise recall and create anxiety;
- Poor or little feedback on progress;
- A lack of interest in the subject.

Deep learners seek to relate theory to practice in a range of different contexts. They are able to organise their impressions into a coherent whole rather a set of disassociated facts or formulae. Deep learning is encouraged by:

- Teaching methods that build on students' existing knowledge and experience
- Active involvement by students in their learning
- Students having choice over content and study methods;
- Long-term engagement with the subject

Strategic learners will adopt whichever approach they believe will maximise their grades. If they believe, rightly or wrongly, that the form of the examination rewards memorisation of disparate facts, they will adopt a surface approach. If they believe that the examination will reward a holistic understanding of key ideas and how these apply in different circumstances they are more likely to adopt a deep approach.

Most students cannot be so readily pigeon holed, displaying characteristics from two or more categories at any one time and may change their preferences over time. Nonetheless, this theory exemplifies the potential shortcomings of a wholly didactic model where it is assumed that what is not said is not learnt. The purpose of this chapter is not to debate at length the merit of this model ([further reading references](#) are provided at the end), but to establish that the intention of any economics course should be more than simply to allow students to adopt surface-learning strategies that promote the accumulation of transient non-contextualised knowledge.

Finally there is the issue of the diversity of ability and prior experience of students. This is especially a problem at level 1, where lecture groups tend to be larger, where some students are new to the subject and others have A' level Economics and/or Maths or equivalent, and where exit routes can vary from Single Honours Economics degrees to degrees where no further economics will be studied beyond level 1. How can a traditional lecture cope with diversity? To which students should the lecture be pitched? What back-up support will be necessary for the weaker students and what additional learning activities will stretch the stronger students?

2 Improving lecture practice

2.1 Student preparation for the lecture

In some cases, it may be appropriate for students to come to a lecture 'cold', especially if it is an initial scene-setting lecture. Generally, however, students will gain more from a lecture if they have done some preparatory work. You could assign them reading or specific tasks. If so, you would probably have to address

the question of incentives for students to do this work. This could amount to simple exhortation in previous lectures or in handbooks or online information, where the importance of the preparatory work was stressed. Alternatively, it could be built into a more formal process of study, leading to some specific individual or group work by students.

Top Tip 1: Giving preparatory work for the lecture helps students to see the relevance of the lecture and they will probably learn more.

Prior work could include:

- Using the Web to provide background information. For example, if you were about to introduce the theory of international trade, you could get students to find out about recent debates and issues, such as trade disputes, the agenda for WTO meetings or the views of various interest groups. Such groups could include the US administration, the European Commission, particular industries (such as farming or steel), environmental groups, or various Third World interests (see for example, www.oneworld.net). If you were about to look at competition policy, you could ask students to look at the summaries of Competition and Markets Authority reports on https://www.gov.uk/cma-cases.
- Revisiting relevant theory covered earlier. For example, in the case of trade, the students could be required to revise production possibility curves, opportunity cost, or general equilibrium theory, depending on whether the teaching is at introductory or intermediate level. In the case of competition policy, students could be required to revise relevant parts of the theory of the firm. The lecture could start with a quick 'quiz' using multiple-choice questions (see below on the technology for quizzes and tests in lectures).
- Asking students to identify a set number of issues to do with the topic. This will help them to contextualise the material and see its relevance. These issues could be posted to a discussion board, so that other students could read them. For example, as preparation for a trade theory lecture, you could ask the students to identify recent trade disputes and the arguments used by the various parties to justify their stance, or you could ask them to consider the arguments for and against providing protection for a specific ailing export industry.
- Assigning reading to be completed before the lecture. This could be an introduction to theory or relevant evidence, perhaps from a textbook or an article. A brief quiz on this could be given at the beginning of the lecture, so as to provide an incentive for the students to do the work.

In all the above cases, clear guidance will need to be given to students about what is required of them. This could be given in student handbooks, but should probably be reinforced by having a discussion early on in the course in seminars about the

role of lectures and how students can maximise the learning benefits from them. It would also be useful to remind students periodically in lectures about these expectations.

2.2 Effective presentation

Students are likely to learn more if a lecture is well structured and well presented. Not every lecturer has a charismatic personality, but students can still be engaged and find the lecture an effective learning experience if thought is given to the structure and method of presentation. This section reviews four issues in planning the structure of a lecture: aims and learning objectives; overview and clarity of structure; use of examples and pace. The second half of the section examines three aspects of method of presentation: presenting graphs and equations; displaying material; and using videos. The section concludes with some observations on dealing with disruption.

Aims and learning objectives

It has become commonplace for lecturers to give the aims and learning objectives at the beginning of a lecture, usually in the form of a PowerPoint slide, an overhead transparency (OHT) or a sheet of paper displayed on a visualiser. One of the main drivers for this has been university 'quality' procedures and accountability to external bodies, such as the QAA, and the stress placed on making intended learning outcomes transparent. Whilst it is good practice for students to see the purpose of what is to come in the lecture and what they are supposed to learn, beginning the lecture with a bullet list of aims and learning objectives in educational jargon can be a 'turn-off' for students. It is important to communicate in 'student-friendly' language. For example, if the learning objectives of a lecture include an understanding of a particular economic theory – its properties, its assumptions, how it can be applied and what its limitations are – then state this as such, rather than in terms of, say, the development of cognitive or analytical skills. It may also be helpful to the theory by looking at the problems and issues it can address.

The format of lecture objectives also gives students an indication of the approach to learning that is expected of them. For example, an objective in the form 'Movements along and shifts in the demand curve' implies that students are required to memorise a list of causes and how to depict these on a simple diagram. An objective 'Analyse changes in the demand for consumer products using a market demand curve' implies that the focus of assessment will be on understanding examples of economic behaviour in practice. The signals communicated by these objectives may indicate to students whether surface or deep learning is expected.

Top Tip 2: Students need to comprehend why they are being taught what they are and how they will subsequently be assessed on it.

Overview, contextualising and clarity of structure

At the start of a lecture it is even more important to give students a sense of how the lecture fits into the syllabus and how it follows on from the previous lecture. A 'lecture map' on, say, a PowerPoint slide or OHT can be used to outline the structure of the lecture in terms of main topics, issues and theory. This summary can be referred to as the lecture progresses, helping to retain and reinforce the students' grasp of the lecture's structure. This can also be referred to at the end as part of a brief summary of what has been covered.

Top Tip 3: If you give the students a 'lecture map' on a PowerPoint slide or OHT, this can be referred to as the lecture progresses, thereby helping to retain and reinforce the students' grasp of the lecture's structure. This can also be referred to at the end as part of a brief summary of what has been covered.

Use of examples

Brief up-to-date examples, or appropriate historical examples, can make the lecture much more interesting for students and help them to see the relevance of theory. Careful thought should be given to the number and nature of examples. Too many examples and the students might not be able to 'see the wood for the trees'; too few examples and the material could appear dry and disconnected from reality.

Examples could be very short: for example, reference to some current news item or to some real examples of something (e.g. of actual firms when discussing market structures); or for a quantitative lecture a very brief worked example. Students' understanding of economic concepts is likely to be much better if they can relate them immediately to the concrete. There is an opportunity cost of using examples in terms of time not spent covering additional material, but again, if the success of a lecture is to be judged in terms of learning outcomes, this may be a cost well worth incurring.

Pace

Pace is crucial to the success of any lecture. It is very easy for lecturers to imagine that if something has been said, then it has been understood and absorbed by students. Part of this mindset is the perception of students as receptacles: 'At the beginning of the lecture, you lift the lid on students' heads, pour in an hour's worth of knowledge, close the lids and the students walk out an hour wiser than when they arrived'. Although we all know that this not how students learn, we are

frequently faced with the dilemma of how to 'cover all the material' in the lecture. Too many lecturers, when faced with the approaching end of the lecture and still having a lot of material to cover, talk faster and faster. The problem stems from two main sources.

The first is that courses have become tightly structured to meet the requirements of auditing and quality assurance. For example, each lecture's content might be laid down in the course handbook. This can remove the flexibility of being able to vary the pace and content in response to student feedback or current events.

The second is an increasingly crowded curriculum. Whilst we strive to keep courses up-to-date and include new theoretical developments, policies and applications we are reluctant to delete an equivalent amount of old material. Take the case of a core level 2 Macro module. If we want to look at the development of macroeconomic theory, do we include both classical and Keynesian analysis, the monetarist critique, the rational expectations revolution, new classical theory, real business cycle theory, new Keynesian theory, including DSGE theory, post-Keynesian analysis, models to incorporate inflation targeting, such as the Romer model with aggregate demand considered as a function of inflation rather than the price level in addition to the traditional AD/AS model, the lead up to and aftermath of the financial crisis, the reassessment of theory and policy in the light of the crisis, the importance of balance sheets and regulatory frameworks, and so on? In other words, do we keep adding new developments to the existing course? Our module specifications say that in lecture x we will cover topic y, and yet in topic y we want to include more and more each year. What is the solution?

The solution is not to speak faster and faster! Students would almost certainly end up learning less, not more. Either you have to reduce the syllabus content so that it can be covered in sufficient depth and at an appropriate pace within the lecture time, or you have to abandon the notion that the lecture should be used to 'cover' all the material. If this latter is to be the solution, then you have to plan carefully how the lecture fits in with the remaining parts of the students' learning. Is it to be used to introduce topics, or to go thought the core theory, or to give pointers or examples not available elsewhere?

Pacing is not just about covering an appropriate amount of material. You will have to decide just what you want students to *do* in lectures. If you merely want students to copy down notes, it would probably be more efficient to give them the notes as a handout, or post them on your Intranet (unless a key purpose of the lecture is for students to learn the skills of rapid note taking, in which case some specific instruction in the process would probably be a good idea).

Presumably, you will want students to understand what you are covering, to see its relevance and to be motivated to learn more. In that case, the pacing must take account of this. The planning and delivery of the lecture will need to balance

demands on students' writing, listening, watching and understanding. It is too easy to put up a completed OHT, a sheet full of material on a visualiser, or a complete PowerPoint slide and then start talking about it straight away. What are the students to do? Are they to copy it down or concentrate on what you are saying? If you want them to take something down, it might be best to pause while they do so, especially if it is something they are unlikely to grasp immediately.

An important part of pacing is recognising the attention span of students. This tends to drop off quickly after 20 minutes, unless the students are particularly excited or fascinated by what you have to say (see Bligh, 1998). Part of the solution lies in varying the pace through examples or anecdotes when attention is likely to flag. You could vary the use of visual materials, so that sometimes the students would be concentrating on them and at other times on you; sometimes copying things down and at others just listening or composing their own notes. The key is to inject light and shade: to vary the tempo, the nature of the material and what is required of students. Alternatively you could move away from the lecture being solely a talk and engage the students in various activities. Some suggestions are given in section 2.3.

Presenting graphs and equations

If you are using PowerPoint slides, an overhead projector or a visualiser, an effective way of presenting graphical or mathematical material is to give the students a half-complete diagram or proof which is completed in the lecture. For example, if you were presenting a model which shows an initial equilibrium position and then the effects of a shift in one or more curves, you could give the students the initial position on a handout (with or without the equilibrium marked) and ask students to complete the diagram. This is particularly useful for complex diagrams, such as general equilibrium diagrams. Not only does it save time by avoiding the need for students to copy down the initial part of the diagram, but it also ensures that students can focus on the key points you are making. It is also likely to mean that the finished diagram that the students are drawing is accurate.

This approach allows learning to be an active, yet efficient, experience. Learning is likely to be more active if you ask the students to complete the diagram or proof first and then you go through it. But even asking students to copy down the additional material is likely to make learning more active and effective than students rushing to copy a complete model. If they are copying the key parts (e.g. the effects of a shift in a curve), they have more time to reflect on what is happening in the model.

Resources provided in this way may cause problems in terms of cost and equal opportunities. Can your department afford to make copies free to students? If you make them available electronically, what will you do about students with no personal access to a PC or a printer, or who simply forget to print them off

beforehand or cannot be bothered? Is it acceptable to sell these materials to students? One solution adopted by several departments is to produce detailed course handbooks with lecture outlines. These outlines could contain the partially complete diagrams and proofs. The handbooks could be sold to the students at cost, with all students expected to purchase them. However, this practice incurs up-front cost in preparation time, and reduced scope to amend the teaching programme in response to student feedback.

Displaying material

Whether using the whiteboard/blackboard, a visualiser, OHTs or PowerPoint slides, it is important to give careful thought to what you want the students to do. In lieu of any other guidance, students will assume that you intend the displayed material to be copied down. If used well, visual materials can considerably improve learning by providing a clear structure for the lecture. If the structure remains on the screen, or is referred back to at the start of each new section, students will find it easier to see how the various parts of the lecture are related, even if their attention wanders for a period of time. Similarly, if students lose the thread of an argument, they will be able to pick up the thread from a 'lecture map' presented on a slide or board.

But how much material should you display? If you display a lot, students will spend a relatively large proportion of the lecture simply copying things down. Is this an efficient use of their time? Would it be better to give them a handout or post the material on the Intranet or VLE (such as Blackboard or Moodle)? If you do want them to copy things down, then you must allow enough time for them to do this.

An advantage off using a board is that your writing speed imposes a natural brake on the rate at which students have to process new information. However, if you are talking while you are writing, students will have great difficulty in listening to what you say, copying what you write, and adding notes on what you are saying. Also, some students may find difficulty in reading your handwriting, or in hearing what you say if your back is turned while you are writing. To some extent this can be overcome by writing on a sheet displayed on a visualiser, but students may still struggle with some lecturers' handwriting.

If you use PowerPoint slides or OHTs, the problem of note taking can be worse, as the slides are already complete. Too often, lecturers display a slide and then start talking about it straight away. What is the student to do: copy the slide or take down your comments? For experienced lecturers, this may sound obvious, but it is easy for all of us to fall into the trap of expecting students at one and the same time to copy a slide *and* to listen to our commentary on a slide and annotate their copy of it accordingly.

One solution to the time constraint is to give students your lecture slides in advance, whether in hard copy, or as Word, PowerPoint or other file. If the slides are merely headings, the students can then make their lecture notes under them.

Top Tip 4: Whatever media you use, it is important not to display too much material and to give students time to take things down.

If you are using PowerPoint, you can animate your slides so that bullets or paragraphs or stages in a mathematical demonstration appear one at a time. Similarly you can animate graphs by having lines appear one at a time. They can easily be made to shift in the required direction. A little playing around with the 'Slide show', 'Custom animation' feature can enable you to display diagrams in an interesting and effective way. Increasingly, textbook publishers provide OHTs and/or PowerPoint files of lecture outlines. While these can save you time in preparation, there is the danger that they can make the lecture too 'pre-programmed' in a way that does not necessarily match your style of delivery or the content you wish to cover. In this respect, PowerPoint files are clearly much more flexible than OHTs, since you can customise them to suit your particular lectures.

If you do use the animation features of PowerPoint, be careful not to make them too 'whizzy'. The animation should be designed to help understanding, by, for example, showing the direction of a shift, and not distract the students from the model's properties and the points being made.

It is also important, especially in diagrams, to make a consistent use of colour. For example, original lines could be in one colour, initially shifted lines in a second colour and further shifted lines in a third colour. Alternatively, one type of line (e.g. revenue curves) could in in one colour and another type (e.g. cost curves) in another colour, and so on. Shifted lines would be in a lighter or darker version of the original colour. Either scheme, if consistently applied, makes it much easier for students to understand what is going on in a diagram.

Use of videos

Many lecture theatres permit the playing of DVDs or streaming video clips through the lectern PC or laptop and data projector. Videos, if used with discretion, can add substantially to the impact of a lecture.

Two important questions to consider in using videos are 'What length of clip should I use?' and 'What are the best sources of video material?' If the video is being used to illustrate a point it is best to keep the clip to no more than five minutes. This change of media and pace can aid students' concentration and help them to see the relevance of points you are making. Even with a short video clip, the relevance of the clip may not be obvious to all students. You may well need to

introduce the clip so as to prime students about what you want them to gain from it.

> **Top Tip 5: Video clips, if used carefully, can considerably enhance student learning by helping to contextualise material through the provision of examples. By providing interest and variety in a lecture, they can increase student motivation and interest.**

Sometimes you may wish to show a longer extract. For example, you may wish to use the video as a case study. There is a potential problem here. With the exception of videos made for educational purposes, the pace and structure of the video may make it difficult for the student to make notes. If this is the case, you might find it useful to display some bullet points on an OHP while the video is playing. These could help to make the structure of the video more transparent.

One of the most effective uses of video is to give a topical illustration of a point or to set the scene with something in the news. Probably the best sources here are news magazine programmes, such as *Newsnight* on BBC2 and Channel 4 News. Other broadcast sources include *Panorama* and *The Money Programme*. Alternatively, you could stream clips from news sites, whether from broadcasters' sites or from newspaper sites.

Most universities hold an ERA (Educational Recording Agency) Licence. This allows free use of TV material for educational purposes. The licence permits you or any other university employee to record programmes off air at home or at the university, to make multiple copies (e.g. for depositing in the library) and to compile extracts. You can edit, but not adapt the recordings. You can show all or part of a programme, so long as it is for educational purposes. The DVD should be labelled, 'This recording is to be used only for educational purposes'. Open University recordings require a separate licence. There is no licensing scheme to cover cable or satellite broadcasts and you are free to copy and show these. It is advisable to check with your university the precise nature of what you can and cannot show.

Dealing with disruption

Hopefully, you will not experience this. If you do, you need first to be aware of why the disruption is occurring. It is likely to stem from lack of student involvement and boredom. While it would be nice to think that you are so charismatic that this could never occur, the solution lies not so much in how good a performer you are, but rather in what the students themselves are being required to do in the lecture.

If they are merely being required to listen for an hour, they are very likely to get bored unless you are a superb entertainer. To keep students engaged, try the following (several of which are examined in more detail below):

- ensuring that they have a clear understanding of the structure of the lecture and its relevance to the rest of the module;
- changing the pace;
- giving students different activities (such as short questions to test their understanding);
- making it possible for them to take notes by not going too fast;
- making careful use of visual aids;
- illustrating points with examples;
- giving them one or two short breaks.

Sometimes, students studying economics are doing so reluctantly, either because they had no choice (e.g. they are studying an economics module as a compulsory module on a non-economics degree) or because the subject has turned out to be different from what they had expected. The solution here is to focus on the relevance of the subject to their degree and more generally to important social issues. If they can see that economics grapples with real-world problems, and if what you are doing with them helps them to gain a better understanding of these problems and possible solutions to them, they are likely to be much more sympathetically disposed to studying the subject.

If, despite the above, students are disruptive (by talking, leaving the lecture, coming in late, etc.), then deal with it directly. If you ignore it, it will probably get worse. First try talking to the whole lecture group about your expectations of them and why 'good behaviour' is vital. Then, on any subsequent occasion when disruption occurs, address the culprits directly and, if necessary, ask them to leave.

2.3 Activities in lectures

An hour (or even 50 minutes) is a long time to listen and concentrate. As we have seen, concentration and retention rapidly diminishes after 20 minutes. Not only should student learning be as active as possible, it should be efficient. Ideally, a student should be able to:

- Identify main points;
- Distinguish the important from the diversion;
- Identify when the same point is being presented in different ways;
- Perceive connections (e.g. between one theory or part of a theory and another);
- Relate examples to concepts and theories;
- Relate evidence to propositions.

These can all be aided by a careful use of activities in lectures and this section examines different types of activity that could be used. The inclusion of activities comes at the expense of time the lecturer would otherwise spend in talking to the students. The case for using activities is that the breadth and depth of students' understanding is increased even though the sheer quantity of information covered by the lecturer is reduced.

Top Tip 6: The more active the participation of students, the longer and better will they be able to concentrate.

Tests/quizzes

One of the most effective ways of making learning a more active process and helping students to check on their understanding and learn from their mistakes is to give them questions. The simplest forms include multiple-choice, true/false or listing, or doing a calculation. The questions can be displayed on a PowerPoint slide, an OHT or using a visualiser, although, as Case Study 1 illustrates, there are more sophisticated ways of doing this, for example by using an audience response system (clickers).

The questions could be at the beginning of a topic. For example, if you were about to look at monopoly, you could give the students a list of companies and ask them to identify which are monopolies. Having done this, you could then look at the difficulties of identification, when the boundaries of an industry are 'fuzzy'; the importance of market power; the measurement of market power; types of barriers to entry, etc. In each case you could use the examples from the quiz. Students would then grasp the theoretical points you were making, having first considered some examples and being able to relate your arguments to them.

Alternatively, the questions could be given at the end of a section. This could then test students' understanding. If you then asked for responses (e.g. hands up those who answered A…), this would give an indication of how well key points had been understood. Again, as Case Study 1 shows, a good way of doing this is to use an audience response system. You might also ask students to write down their answers and pass them to their neighbour to mark. When students see what their neighbour has written they can learn from each other as well as from the lecturer, especially if they are asked to spend a couple of minutes justifying their answer to their neighbour.

Top Tip 7: The use of multiple-choice or other simple response questions two or three times per lecture can help to provide a break in pace, an opportunity for reflection and reinforcement and a check on students' understanding.

Worksheet or material on the screen or board

An alternative to short questions is to give the students a problem or some data to consider. This could be on paper, with the students picking up a worksheet at the beginning of the lecture, or it could be displayed on the screen or board. It is normally a good idea for students to attempt such questions in pairs as they can learn from each other. It also makes the exercise more fun. You can then go through the question from the front.

You might also ask students to read a passage that you hand out and then to answer one or two questions on it. The passage could be from a newspaper, book, journal or magazine. It is probably best to make the questions relatively closed. For example, if the lecture focuses on exchange rates, you could give them a brief news article reporting changes in exchange rates between two or more currencies and then ask them to identify possible causes of these changes. More open-ended questions are normally best considered in seminars, where students have the opportunity to discuss their answers with the group.

Completing diagrams or proofs

Copying down mathematical arguments or diagrams can be a fairly mindless exercise. Giving students a partially complete proof or diagram and then asking them to fill in the extra material can help (as argued above), since the student has time to reflect and to focus on the key points you are attempting to convey. For example, if you were looking at income and substitution effects using indifference analysis, you could present the students with a diagram which included the indifference map and the initial budget line, and then ask them to draw the new budget line and the income and substitution effects. Presenting the students with the diagrams in this way would allow you to ensure that they could clearly distinguish between normal, inferior and Giffen goods.

You can make this process more active by stopping part way through presenting a model and getting students to fill in the next step. They can do this individually or discuss it with their neighbour. Alternatively, you can test their understanding at a particular point by asking them which way a particular curve shifts if you change a particular variable, or getting them to repeat a particular mathematical step using different numbers.

Making lists

These can be useful for getting students to think expansively or to think about policy or other implications. For example, you could ask them to identify a list of possible determinants of a shift in a curve or a list of advantages and disadvantages of a particular policy. They could do this individually or with their neighbour; or

they could start by doing it individually and then compare their list with their neighbour's or get their neighbour to mark them against a list that you supply.

The hybrid between a lecture and workshop

You might restrict the formal lecture on a topic to 20 minutes and then set students some work to do, either through a worksheet or questions on the screen. The questions could be in the form of calculations or data response, preferably of the closed variety. You could go through the questions at the end, or post the answers on your Intranet. This practice is illustrated in Case Study 2. Alternatively, you might give students a set of questions on a case study or an article.

The formal lecture might be presented as a follow-up to the questions or it might be used to introduce the key ideas that will be investigated further through the questions. Either way, it is important for you to integrate the case study or article carefully with the lecture to ensure that students are getting the best from both parts.

2.4 Use of breaks in lectures

Given the decline in student attention after some 15 to 20 minutes, it makes sense to give students a break during the lecture. When the lecture resumes, attention is likely to be restored to its original or near original level. This does require, however, that you avoid the temptation to fill the lecture time with you talking, under the mistaken belief that the more you succeed in saying, the more students will be receiving.

If you do opt to give students one or more short breaks, there are several things that you can ask students to do with this time. Some are related to the lecture; some are not.

Breaks related to the lecture

You can ask the students to use the break to reflect on what they have learned so far in the lecture. A good way of using this 'pause for reflection' is to get them to look through the notes they have taken and 'revise' what you have covered in the first part of the lecture. They could also 'tidy up' their notes. One way in which they could do this is to re-work the material into a 'Mind-Map' diagram (Buzan and Buzan, 1994). If this lecture follows on from a previous one, you could also ask them to check that their notes follow on from the previous lecture.

An alternative is for students to exchange notes with their neighbour and for the neighbour to comment on them. This both provides useful feedback to each student on the notes they have made and also helps students to learn from their neighbour's notes. The process should help to clarify understanding and to identify gaps.

Breaks unrelated to the lecture

The simplest form of break is to give the students a few minutes just to stop and have a bit of quiet time or to chat to their neighbour. If the room lends itself, you could let them move around. Such breaks can get noisy and so it is important to set 'rules' that allow you to end the break quickly so that the lecture can resume.

An alternative to the 'pure' break is to provide some form of entertainment. Many lecturers may feel uncomfortable about this, but it can prove very popular with students and the complete change can be very effective in helping to restore concentration. For example you might show an entertaining video clip or read a diverting and interesting text. The video clip could be a cartoon or a comedy sketch, or anything that you feel the students might like (within reason). You could even serialise a programme.

Alternatively you could show an economics item from the week's news which, even if unrelated to the lecture, can reinforce the relevance of economics to current issues. This can be very useful at level 1 for students who will not study the subject again, or who might be persuaded to do so if their interest can be sufficiently aroused.

You might choose some text from a news extract or even a poem. You could even arrange with a colleague to come into your lecture to read something (a 'favour' you could reciprocate). You could assign students in rota to bring something to read out – although you may have to vet their contribution in advance!

2.5 Overcoming barriers to more active learning in lectures

Section 2 has presented a number of alternatives to traditional practice in economics lectures. Whilst these approaches are becoming increasingly common in practice, there are various barriers which restrict their adoption:

- Preparation time: preparing materials (e.g. PowerPoint slides), rewriting lecture notes, etc.;

- Other time costs: maintaining a virtual learning environment (VLE), answering student questions in an online environment, the time taken to gain and evaluate student feedback;
- Risks: students may react adversely to being challenged (at least initially); the new methods may not be successful in terms of learning outcomes as hoped; you may feel uncomfortable in a new lecturing environment;
- Reactions of colleagues: if you take a 'radical' approach to lectures, and the students like it, there could be an adverse reaction from more conservative colleagues; there may be a departmental expectation of what a lecture should be and this may be a very traditional model of 'covering material';
- Financial considerations: the use of technology (such as an audience response system or aspects of a VLE) may require hardware, software and technical support, all of which may be blocked for financial reasons.

Given the above, it is often easier to introduce change iteratively. Try some small activity in a lecture that takes no more than a few minutes, or try introducing a break for a couple of minutes. See how successful it is.

Try revisiting your learning objectives and asking whether the lecture really addresses them. Revisit how the seminars build on the lecture material. Consider whether you are making the best use of the materials you make available to students. Do they contain too much or too little material? Should they be made available before or after the lecture?

Consider how you present information, for example, on PowerPoint slides. Do you want students to copy them down? Why? Are you giving them long enough? What work do you expect your students to have done before the lecture? Should you assign specific preparatory activities?

This is not to say that you should not introduce radical change, but a progressive approach is probably safer, less costly and more practical. Try limiting changes initially to things that do not take up more time. Once you have learned how to manage the new processes efficiently, they may save you time. For example, students may use more forms of self-help and rely less on coming to see you, or you may be able to rely more on FAQs on a discussion board. This could then allow you to devote more time to other forms of student support or to developing materials.

3 Building on lectures and student support

What do you expect your students to do to build on the lecture? What support do you offer them and how can this be provided in a cost-effective way?

3.1 Work for seminars and tutorials.

Typically, lectures are directly related to seminars or tutorials and it is worth stressing the importance of carefully integrating the two. You will need to address the following questions.

- How much time do you want students to spend on follow-up private study after the lecture before coming to the seminar? This should be made clear to students, so that they can maximise the benefits from the seminar. It is unwise to assume that students will know what is expected of them.
- Do you want to refer back to material or activities in previous seminars? If you do, this is likely to give students a greater understanding of how the course is structured.
- Do the seminar questions directly relate to the material covered in the lecture? Here you will need to decide whether the lecture material needs reinforcing through seminar questions or whether the seminar could be used for follow-up work, such as examining policy implications. For example, a seminar following a lecture on fiscal policy could involve students preparing a Budget based on information provided to them beforehand or examining the details of a particular Budget.
- If you are going to use various short activities in lectures, including diagram and table manipulation, completing proofs, etc., does this enable you to do more creative things in seminars? For example, you could reduce the amount of 'drilling' in seminars (such as going through numerical exercises) and increase the amount of debate on policy issues (see chapter on seminars).
- Do you use some of the time in seminars to allow students to ask about points they did not understand in the lectures? Do you actively encourage them to do this? If so, are there any other ways of achieving the same objectives that you might consider using, such as discussion boards to which you reply or student self-support groups (see archived chapter on VLEs)? These alternatives could release seminar time for other activities and prevent them becoming in part a repeat of the lecture.

It is impossible to give answers to these questions that are appropriate to all circumstances. For example, the most appropriate answer will depend on the nature of the learning objectives and the type of work students are expected to undertake outside of lectures and seminars. However, it is important to stress the need to integrate the lectures and seminars and to use each to complement the other.

3.2 Online materials

Posting materials, such as lecture notes and copies of PowerPoint slides, has become commonplace. These could be within a virtual learning environment (VLE), such as Blackboard or Moodle, or on the course web-site, intranet or shared drive. If learning in lectures is to be an active experience for students, you will need to have a clear strategy for the use of these materials. If they are too detailed

and follow the lecture very closely, they could be seen as a substitute for the lecture by the student. You may well want them to be so, thereby giving students greater flexibility in their modes of study. In this case, however, you will need to address the issue of students merely downloading the materials and not actually using them, but being lulled into a false sense of security that they can use them 'later'.

Online materials can support student learning more effectively if they are integrated with the seminar programme and related to assessment. If your course is in a VLE, you can use its features to organise the materials within the scheduled programme and, if you choose, make them available for only a specific period of time. This can provide an incentive for students to access the materials shortly after the lecture.

More creative use of online materials as a follow-up to lectures would include interactive 'study guide' questions. For example, if you were covering a particular model in the lecture, you could set a series of questions online for students to test, consolidate and deepen their understanding of the model. These questions could be multiple choice, problems or manipulating graphs. You could choose whether to make the answers available online. Question sets are readily available, whether through the Economics Network question bank, the Economics Network links to resources section or from textbook publishers' sites or electronic resources.

If you are using online study guides, you will need to decide what incentives there will be for students to use them. How closely will you link them to assessment? Will you encourage students to work in small groups and what are the incentive mechanisms for encouraging them to do so?

Lecture capture

Many lecture theatres nowadays are equipped with the facility for recording the lecture. The simplest form is a recording where the audio is what you say and the visual is whatever is presented on the screen, perhaps just from the lectern or your laptop computer, but perhaps also from a visualiser or interactive whiteboard. Another form is similar to this but with the addition of a 'talking head' of you, which appears in a small panel on the screen when the students play it back. When no PowerPoint or other image is displayed on the screen it can be set up so that just the image of you appears in full screen.

Students can access the recording through the module VLE or intranet and play it back in their own time. Normally you can choose when to make the recording available. You might make it permanently available – at least until the end of any resits – or you might prefer to make it available for just a short time after the lecture to encourage students not to get behind.

The advantage of lecture capture is that students can revisit the lecture as many times as they like until they feel they have fully understood it and/or have a comprehensive set of notes. It is also a safety net for students who have missed the lecture, say for reasons of illness. What is more, it allows students to concentrate on understanding during the lecture and not to worry too much about noting everything down.

A possible disadvantage is that lecture attendance will fall as students know that they can always access the lecture online. Where lecture capture has been used, however, most lecturers report that attendance has not fallen, but rather that students see the live lecture and the recording as complements, not substitutes.

The handbook chapter, *Creative uses of in-class technology*, looks at lecture capture in more detail.

Flipping the lecture

The practice of 'flipping the classroom' has developed in many universities and colleges, especially in the USA. In the context of lectures, the flipped classroom is where the lecture is recorded in a studio or empty classroom, or in the lecturer's office or home, and the students access it and watch it in their own time. Alternatively, the lecturer may select online material for the students to watch or read, which may be in the form of podcasts of lectures in the public domain. Or it could be a mix of the two.

Having watched the material, students then come to class – which might be in the full-sized lecture group – and have an interactive session. This can involve exercises, problem solving, case study work, role playing, etc. The session may be in the form of a workshop (see case study 2) where students work individually or in pairs; this is more suited to a traditional fixed-seating lecturer theatre. Alternatively, it could involve small-group work if the room has loose chairs and the students can move around.

Flipping has proved particularly suitable for many US courses, where often there are solely large classes rather than separate lectures and seminars. This allows work done in class to be more interactive and for deeper learning to take place. In the UK system, however, it is less relevant, given that interactive learning can take place in seminars/workshops – if appropriately designed (see the handbook chapter on Seminars), especially if the lectures themselves also contain interactive elements.

Nevertheless, the advent of facilities to record lectures and to integrate external materials within them does give universities greater flexibility in allocating both staff time and rooms. One way in which flipping could take place would be for all the lecture materials to be pre-recorded and for the 'lecture' sessions to be used

solely for workshops on more technical issues and for the seminars to concentrate more on debate and policy issues.

Recording of lectures in the studio/office/empty classroom, which could be of varying lengths to suit the material, is particularly suitable for courses which use problem-based learning. This is examined in the handbook chapter on Problem-Based Learning.

3.3 Use of interactive facilities in VLEs

The use of VLEs is discussed more fully in a later chapter, now archived. This section provides a brief overview of possible links between lectures and a VLE.

Discussion boards

One useful mechanism for encouraging students to make full use of their learning in lectures is to set up a discussion board. This is easy to do in a VLE. Alternatively, you could set up a Facebook page specifically for your module. But even a conventional email list can serve the purpose. You can post questions on the lecture that follow on directly from its content and students would be expected to respond. For example, if the lecture was examining market failures, the discussion could be based on particular examples of market failure and possible policy solutions. You can 'require' students to make a set minimum number of contributions. You can log their contributions and decide on an appropriate encouragement or 'penalty' for students who do not contribute.

If you do set up a discussion board or Facebook page, you will have to decide what students can expect of you. If you merely 'pump prime' it and then expect students to make all the contributions, it can be relatively undemanding in terms of your time. If used in this way, it can be a very useful mechanism for promoting a culture of mutual self-help. It is important that students clearly understand what use they are expected to make of the medium and what your role is.

Chat rooms as virtual seminars

As an alternative or addition to using a discussion board, you could set up a chat room in a VLE. Students could log on at a particular time and you could choose whether or not to lead it, merely start it off or not be present at all. The virtual seminar could last for a set length of time or could be open ended. The advantage of the former is that it requires a clear commitment of time by the student and is seen as something structured. The open-ended seminar has the advantage that it can continue as long as it is valuable to the remaining students.

Either way, the seminar can be seen as a discussion session on the lecture, whose purpose is to help students to sort out problems they may have. These may be

simple questions of clarification or they may be issues of contextualisation or application. Alternatively, you could start the seminar by giving some follow-up material from the lecture – an example, case study or problem – and posing the students some questions based on it.

To get the students used to using the chat room facility and to the protocols for 'synchronous' debate, it is a good idea to hold the first of these seminars in a computer lab with you present to answer questions about how to use the facility and to ensure that people are contributing. Thereafter, students can take part in the seminar from any computer with Web access.

It is important to recognise an important limitation of chat rooms: they have poor graphical and algebraic facilities. This makes them unsuitable for technical discussions. They can be excellent, however, for exploring policy implications and for examining issues where there is scope for differences in opinion. They can also provide a medium in which shy students can feel comfortable in contributing, especially if you allow them to use an alias, with their true identity known only to you.

If one of these virtual seminars is held after each lecture (in addition to normal face-to-face seminars), it can significantly deepen students' learning from the lecture and make them feel that they have an opportunity to contribute.

If you have time, you can post edited 'highlights' from the seminar. Failing this, you can simply leave the contributions on the site for students to revisit in their own time.

For a more general discussion of virtual seminars and how they can be used, see the case study, Use of Virtual Seminars in Economic Principles, on the Economics Network site.

Follow-up questions by students

You could encourage students to contact you if they have queries about the lecture. If you do not want to answer the same question over and over again, then you could again use a discussion board or Facebook page with a 'frequently asked questions' (FAQ) section. Once you have answered a question and posted the answer, then you will not answer the same question again, even if asked by a different student. The students would be expected to consult the FAQ section to check that any question they ask you has not already been answered. This can save you a lot of time and is very useful for encouraging a culture of self-help in learning, rather than students simply expecting 'to be told'. An FAQ section could be substituted for half of your office hours and you could dedicate the released time to answering the online questions.

Top Tip 10: Encourage students to answer questions posed by other students after the lecture on a discussion board. You need only intervene if the students were not working their way to the 'right' answers. This is a mechanism for encouraging self-help.

3.4 Assigned work

Assigned work: private study

Rather than merely expecting students to follow-up the lecture by reading or working through questions, you could assign them work to do. If you are not assessing this assigned work, whether summatively or purely formatively, you will need to provide incentives to encourage students to complete this work.

You could emphasise the intrinsic benefits of the work in helping them to improve their understanding and, thereby, their final grade. You might also emphasise the development of subject-specific and generic skills that will be of benefit to them later in their studies or in their career. The use of log books or a system of personal development plans/portfolios (PDPs) would help to encourage this more holistic and reflective approach.

The assigned work could help students to prepare for the next lecture. For example, if in the next lecture you are going to develop a theory that you have introduced, you could set students a couple of case studies that put the theory into an applied context or set a couple of problems that require the students to use the theory. For example, if you have been looking at Keynesian goods market analysis, or *IS/LM* or *IS/MP* analysis, and were planning to look at fiscal policy in the next lecture, you could get the students to study particular features of the last Budget and how they relate to projections made in the government's *Budget* document. This type of work can help students to see how the lectures are linked. It is useful to pose one or two questions at the beginning of the next lecture to evaluate this work. These could be in the form of multiple-choice questions, e.g. on a Powerpoint slide. A show of hands would be a simple way of checking how well the students had answered them. An audience response system is a more sophisticated approach (see Case Study 1 below).

Assessed work: formative and summative

There are several ways in which lectures can be linked to assessment.

First, students' understanding of the material may be tested directly. A seminar shortly after the lecture could begin with an objective test, a short essay, a problem, or a case study.

Second, the lecture could be directly relevant to an examination or formally assessed assignment. Students are likely to be motivated by the knowledge that a specific lecture covers material directly relevant to a question posed in the examination. However, while this might be an effective means of getting students to attend the lecture and to concentrate, it could encourage surface learning if it merely provides an opportunity for students to regurgitate material. If deeper learning is to be encouraged, then students would need to know that the form of the assessment will require them to apply, rather than reproduce, the understanding gained through the lecture.

Third, students' lecture notes could be assessed. This could form a small part of summative assessment, if clear marking criteria have been given to students. Alternatively, students could read and provide written comments on each other's notes. This commentary could then be assessed. This approach provides benefits to students through the commentaries they receive from peers and the reflection on note-taking that the assessment encourages.

Fourth, each student could be asked to provide a commentary on one lecture which would be distributed to other students and formally assessed. The number of students commenting on each lecture would vary according the size of the lecture group. Once students have prepared their commentary they could be disseminated through a VLE, Intranet or shared drive. You could require that word processed notes should have appropriate diagrams and tables in PowerPoint or Excel, pasted into the document. With a large lecture group, you could assign some students to act as editors of the notes. These types of activity not only encourage students to take a more reflective approach to their learning in lectures but also help to develop précis and critical skills. They also signal the importance of lectures and provide useful feedback to you.

4 Evaluating your lecture

Most universities have systems of formal student evaluation of lectures, involving some form of questionnaire. Sometimes these simply involve students scoring particular aspects of the lectures, such as clarity, pace and relevance. Sometimes they give the opportunity for students to make comments, and sometimes both. If these are to be used to allow you to make improvements to your lecturing, it is important first to establish what that the questions are seeking to evaluate and what assumptions are being made. For example, the questions may focus largely or wholly on you as a 'performer', rather than on the student learning experience. A lecturer may be very entertaining and popular with students, but that does not necessarily mean that lectures have been effective in terms of student learning.

If the most effective form of lecture is one where the students are actively learning during and after the lecture, then evaluation questions should reflect this. Students may prefer lectures that allow them to get a clear set of notes which are relevant to

their formal assessment. As discussed above, some students prefer to be 'passive learners', and may resent lectures that are challenging in terms of material and activities.

The formal student questionnaire is only one means of evaluating your lecture and gaining useful feedback. This section reviews other methods of evaluating the success of a lecture programme.

Self-evaluation: judged against criteria

One of the most valuable means of evaluating your lectures is to reflect on what you are planning to do or have done in terms of student learning objectives. Before the lecture you might consider the following:

- What do you want students to get from the lecture?
- How will the lecture achieve this?
- Are you planning to cover the right amount of material, given the abilities, experience and motivation of the students?
- Are there any other better ways of organising your material?
- Are the examples appropriate?
- Are visual aids clear and the right length? How could they be improved?
- What activities for students are planned? What do you want students to gain from these activities?
- How will the materials you provide to students complement the lecture? Will they encourage or discourage attendance and/or attention?
- How will the lecture be related to assessment?

This list is by no means exhaustive, but it does illustrate the importance of reflecting on the links between what you are planning to do and what the students will actually do and learn (as opposed to what you would like them to). After the lecture, it is important to reflect on what you believe students have learnt and whether you could improve on delivery, content and student activity. It is vitally important to be realistic and not to believe that just because you have said something, students will have understood it. Try to judge honestly what you have achieved in terms of the learning objectives you have set. While self-evaluation is important, this should ideally be backed up with more objective forms of evaluation.

Feedback during the lecture

If you are brave, you could ask the students periodically to judge your lecture against some clear criteria. This could be in the form of multiple-choice questions, perhaps using an audience response system. This allows students to 'vote' on various aspects of the lecture and the results are instantly displayed for you and the students to see. A less threatening alternative is to ask students to complete short

question slips and to deposit these in a box at the end of the lecture. These could be questions about specific aspects of the lecture, or they could be more general. For example, you could ask students to name two things they liked about the lecture, two things they found difficult and two ways in which the lecture could be improved.

It is best to avoid asking students to comment orally on aspects of the lecture, unless the group is small and the students feel very comfortable to state that they are having problems. Whilst traditional forms of lecturing sometimes include asking students orally whether they have understood, this is normally a waste of time as they will generally prefer not to respond.

Feedback after the lecture

If you are using a virtual learning environment (VLE), such as Blackboard or Moodle, you could set up a discussion board inviting comments on the lecture. You could arrange this in sections. For example, students could be asked to identify topics they have not understood, questions they would like to ask, and discussions to which they would like to contribute. You could have a section devoted purely to general feedback on the lectures. You could have an FAQ section, where you post the answers on the strict understanding that if a student asks a question, you will answer it only if you have not already answered the same question (or very similar) from another student. As well as providing useful feedback for improving the quality of your lectures, such a system supports students' learning.

If you do not have access to a VLE, an email list can serve the same function. You could also use email, if you want students to be able to comment to you privately. Alternatively, you could ask students to submit written comments on the lecture, and then come to see you personally to discuss their comments. Provided this is set up in a spirit of being mutually helpful, it could be a very useful and a profitable use of the office hours system. Alternatively, some time could be set aside in seminars to discuss these comments.

Some lecturers provide students with their mobile phone number and encourage students to ring them with any queries. These can be much quicker to resolve than through email as the query can be discussed. To protect their privacy, some lecturers may prefer to have a dedicated pay-as-you-go mobile for this purpose.

Submission of notes by students

Another useful way of assessing how well you have communicated is for students to submit their lecture notes to you for comment. Use of this practice depends on how much time you have to devote to making comments, but verbal comments could be delivered quickly and individual students could see you with their notes in

your office hours. This approach can provide the lecture with valuable feedback on the effectiveness of lectures and students with valuable comments on their note-taking.

Peer observation

Many departments have instituted a formal system of peer observation of teaching as part of an appraisal system. Others use it as a confidential and more informal form of staff development. If it is used to enhance teaching, rather than merely judging performance, it can play a very valuable role in improving student learning from classes.

A pairing system, where the two lecturers take it in turns to be observer and observed, can be a relatively unthreatening process and a very useful means of finding out how to improve your lecturing skills. This is especially so if the process is carefully structured, with prior discussion of learning objectives between observer and observed. The action of observing and giving feedback can be as instructive as the feedback from being observed. There is a danger, however, that the partners merely reinforce each other's prejudices. For this reason, it is normally good practice to rotate partners and also to provide some staff development activity in observing and giving feedback.

5 Case studies

5.1 Case Study 1: The use of an audience response system

John Sloman, The Economics Network, and **Dr. Caroline Elliott**, Lancaster University

One way in which lectures can be made more interactive is to use an <u>audience response system</u> (ARS) or 'clickers'. Universities are increasingly making such systems available in lecture theatres and other classrooms and they are beoming more and more popular with lecturers.

An ARS allows lecturers to ask students questions displayed on the screen. Students then, either individually or in pairs, use a handset to answer the questions. If you are not familiar with it, the system is similar to the 'ask the audience' feature in the popular TV show, *Who Wants to be a Millionaire?* The handset, or 'clicker' as it is often called, is similar to a TV remote control. It has number and/or letter buttons. The students press these in answer to a multiple-choice or numeric question. The handsets communicate with the lectern computer, or the lecturer's laptop, which has a receiver inserted into a USB port.

The questions can be given verbally, on an overhead projector, or in PowerPoint or Word using a data projector. The responses are then displayed on the screen at the front, either separately or, if PowerPoint is used, integrated into the PowerPoint slide where the question has been displayed.

The system

There are two market-leading systems in UK higher education. The first, and original leader, is InterWrite PRS®, also known simply as a Personal Response System or PRS. It was developed specifically for education. The original version uses an infrared system (as with TV remote controls). This entails having receivers strategically placed around the room, probably wall or ceiling mounted. Up to 40 handsets can be used with each receiver, which must be within 18 metres (60 feet) of each handset. The handsets have 10 alphanumeric buttons and high- and low-confidence buttons.

A more recent version of PRS uses a wireless radio frequency (RF) system. This is the InterWrite PRS RF®. The system allows up to 2000 handsets to be used. These communicate wirelessly with a hub, which can be in the lectern, and which connects via a USB cable to the lectern computer or laptop. Radio frequency systems such as this, unlike infrared, do not require 'line of site' to operate. This is useful where there are likely to be obstructions to line of sight, such as the heads of students in front.

The large RF handsets have 10 numeric buttons plus positive, negative and decimal point buttons, A, B, C, D and E buttons, and True and False buttons. The handsets also display the student's answer. Although the wireless radio version is more expensive in terms of equipment, it can work out cheaper by saving on wiring costs.

The other popular system and now the market leader is TurningPoint®. TurningPoint itself is software designed to run an audience response system, but it comes supplied with ResponseCard® handsets. It can, however, be used with other makes of handset.

As with PRS, TurningPoint with ResponseCard handsets comes in an infrared and radio form. The wireless RF version is better for lecture theatres and has a range of 60 metres. One RF receiver can work with up to 1000 handsets. The ReponseCard handsets are simpler than the large PRS RF version handsets, with only alphanumeric buttons. They are, however, light, thin and robust, and easy for the lecturer to carry around. The latest version has a few more features, including a LCD screen, but is not quite as compact as the simple version.

A recent development for TurningPoint is ResponseWare®. This allows students to use any Internet-enabled device, such as a smartphone, tablet computer or laptop,

as an alternative to a handset. Students simply connect to the ResponseWare [login](#), enter the session number, which you have previously set up, and then a voting screen will appear each time you pose a question and then they simply click on their chosen answer. Universities can purchase licences for users. If, for example, they purchase 100 licences, up to 100 students can use the system at any one time. The licences can be used by anyone in the university – they are not restricted to specific students.

Use with PowerPoint

The software supplied with both PRS and TurningPoint is designed to make it easy to construct questions to be used in freestanding mode, or in PowerPoint or other formats. In the case of PowerPoint, both products add a toolbar to PowerPoint. This enables you to incorporate questions into an existing PowerPoint presentation, which can then be used in lectures with the audience response system.

In PRS, you can simply write your questions on a PowerPoint slide, which could be freestanding in its own file or simply as one of the slides in a presentation. The software then allows you to add PRS functionality to the slide. Each student is represented by a cell in a grid at the bottom of each question slide. When students answer the question, their cell changes colour. The larger the class, the more of the slide is taken up by the grid. With groups larger than 40, it might be preferable to put the question on an OHP acetate while allowing the PRS results to be displayed through the computer projector.

With TurningPoint, you can either create a PowerPoint question slide from scratch directly into TurningPoint format, or you convert an existing PowerPoint slide. TurningPoint allows greater use of the PowerPoint slide than does PRS because it records only the numbers of students who have responded at the top of the slide.

Modes

You can use either system in anonymous mode, which is probably suitable for most lectures, where the objective of using an ARS is to improve student learning and to provide feedback to the lecturer rather than to assess or track students.

Alternatively you can identify responses by handset. Thus if these are allocated to particular students you can grade these students' responses. This might be useful for purely formative assessment or merely to track students' progress or attendance. In certain circumstances, depending on universities' regulations and where cheating is not possible, the systems could be used for summative assessment too.

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The rest of this case study focuses on the learning and feedback benefits of an ARS. First, Caroline Elliott from the University of Huddersfield discusses the use she made of PRS at Lancaster University in a second-year Microeconomics Principles course. It is an extract from an article in the *International Review of Economics Education* (Elliott, 2003).

Use on a Microeconomics level 2 module at Lancaster University

"Having taught second-year microeconomics for a number of years, I was aware that it was a course that students have historically often found challenging. Further, in a lecture environment students may be unwilling to volunteer information regarding their level of understanding of material covered. Consequently, I primarily used the PRS questions as a means of anonymously testing students' understanding of material recently covered. If, after observing the results of a question, I was concerned that students had not fully understood the material on which the question was based, I could briefly review the material for them, and also tailor follow-up tutorial content accordingly. I also used multiple-choice questions as a way of introducing a subject, asking students to apply their economic reasoning skills prior to being formally introduced to a new Microeconomics topic. In addition, I used the PRS to gauge how much information students had remembered about a topic from the first year of their economics degree studies. …

I can confirm that the PRS has provided a very useful means of checking students' understanding of material covered, both quickly in the lectures and also after the lecture. This has meant that I can more accurately determine what material should be revisited in tutorials, as well as in the lectures. Further, I appreciate that it has offered students an easy method of gauging their own understanding, and comparing their performance against that of their peers. While some of these benefits also transpire from the active learning methods reported by Harden *et al. (1968)*[1] *and* Dunn (1969)[2], the PRS has additional advantages. Bar-chart summaries of students' answers are produced and visible to the lecturer and students alike, while responses can also be accurately recalled after the lecture has ended, including the responses of individual students when the PRS is used in the named mode.

I have also found that the PRS has had a very significant effect on students' performance in lectures, stimulating their interest and concentration, as well as their enjoyment of lectures. It has proved to be an excellent method of encouraging active learning, while offering a means of varying the stimuli received by students in a lecture environment. Furthermore, they have found the PRS very easy to use. …

At the end of the lecture course, I asked the students (anonymously) to complete a questionnaire about the PRS as well as a standard lecturer feedback questionnaire.

The PRS questionnaire contained five statements to which students could respond by selecting answers 1 to 5, 1 indicating strong disagreement and 5 denoting strong agreement. Students were also given the opportunity to add any additional comments at the bottom of the questionnaire.

To the statement 'The PRS is easy is use', the median response was 5 and the mean response was 4.96. I fully expected this result and believe that it was helpful that I introduced the students to different features of the technology gradually. Hence, I only explained about the high- and low-confidence buttons on the handsets after the students had used the PRS in a couple of lectures. Similarly, I only used the named mode of operation after a number of lectures in which the PRS was used in the anonymous mode.

The statements 'Using a PRS has increased my enjoyment of lectures' and 'Using a PRS has helped my concentration levels in lectures' both gave rise to encouraging median responses of 4 and mean responses of 4.3. Clearly, not only was I aware that using the PRS improved students' alertness, but also the vast majority of students recognised that their concentration levels improved when using the technology. Unfortunately, it cannot be deduced to what extent this reflects greater active learning or the changes in stimuli received during lectures. 'Using a PRS has encouraged me to attend lectures' produced a median answer of 4 and a mean response of 3.6, with some students pointing out that they would have attended lectures anyway."

Potential benefits of using an ARS in lectures

There are several potential benefits from using an ARS system, depending on the context in which it is used. The first and probably most obvious one is that a lecture can be easily transformed from a simple transmission process, where essentially the role of students is the passive one of receiving, assimilating and recording information, to a much more active learning experience. By encouraging students to think about and respond to carefully tailored questions, students' understanding and retention of material, both factual and theoretical, can be greatly increased.

The second benefit is that it makes the lecture more interesting. Not only is the student more engaged with the material, but the lecture becomes more fun. Most people enjoy a quiz. The instant results and immediate sense of achievement from answering a question correctly are great motivators – as is the desire to get the next question correct if you get the wrong answer! Lecturers may be cautious about using 'fun' as a motivator, but if students learn and remember more, then it would seem to be well justified.

This leads to the third main benefit. More interesting lectures and lectures where more is learned are likely to improve student attendance.

In addition to these benefits, there are some others, depending on how the system is used.

- It is a very efficient way of asking questions. The results can be shown immediately in the form of a bar chart.
- It eliminates the 'crowd' effect of getting students to respond to questions by a show of hands. With a show of hands, for example, answer A tends to be selected much less frequently, and a popular answer is likely to encourage the 'don't knows' to raise their hands too. With an ARS, it is virtually impossible to see what other students are selecting, except perhaps for their neighbour.
- Sharing one handset between two students and allowing them to discuss the answer to each question can improve understanding as they can learn from each other.
- At the start of the course, it can be used to establish personal characteristics of students, such as age, sex, what degree they are on, whether or not they have A-level Economics or Maths, whether they are straight from school, whether the course is compulsory or optional for them, and so on. Not only does this provide useful information for you as lecturer, but it is also a way of building awareness by students of the community of which they are part.
- It provides instant feedback to the lecturer on students' understanding. For example, a large majority with the correct answer would suggest that students have understood and hence you can progress to the next section of the lecture. If, however, the answers are evenly spread between the alternatives is would suggest a general misunderstanding and you might want to go though the material again, perhaps in a slightly different way. If a large number of students have selected a particular wrong answer it can suggest a particular misunderstanding and you might want to address this.
- The system can be used to give the lecturer instant feedback on the students' perception of the quality of the lecture. You would need to be brave to do this, but by asking the students what are the best and worst aspects of your lecturing, you can adjust to this immediately rather than waiting for the class satisfaction survey or relying on anecdotal comments. Other questions might be on whether the pace is too fast or too slow, or whether there are too many or too few examples. Also any point of concern raised by individual students outside the lecture can be put to the whole class to test whether this is of general concern.
- It can be used to check on prior learning from prepared work. This not only provides an incentive for students to prepare for lectures, but again provides useful feedback to the lecturer. Similarly it can be used to check on understanding of material from the previous lecture.
- It can be used to establish students' opinions on open-ended topics or policy issues, such as whether income should be redistributed from rich to poor or whether the government should cut taxes and also government expenditure by a corresponding amount. This helps the lecturer to balance discussion of

advantages and disadvantages by directly addressing the views of the students.

- Classroom experiments and games can be easily conducted. These can be an excellent way of illustrating theoretical or conceptual points. You can find many such games on the Classroom Expernomics site.
- Revision sessions: a large proportion of a lecture could be given over to questions as a way of giving students practice for a forthcoming exam.

If the system is used in the named mode, it can also be used to keep a record of attendance. In addition, students' answers can be stored and used for identifying students who are in need of support. In certain controlled conditions, it could also be used for summative assessment.

Possible drawbacks of using an ARS

Some lecturers worry about the time taken to distribute handsets and collect them in at the end. Typically, however, if distribution is carefully planned, this should take no more than a couple of minutes and hand-in even less, especially if students deposit their handsets into a box on the way out of the theatre. If students have their own handsets or if ResponseWare for students' own smartphones/tablets/laptops is used, then there should be no set-up costs at all. Some universities distribute personal handsets free to students at the beginning of the course and only charge for replacements. This too eliminates hand-out/hand-in costs.

Another concern is whether so much material can be 'covered' in lectures, given that the questions inevitably take time that could have been used for talking by the lecturer. The obvious answer to this question is that it is better to sacrifice some words for the sake of better learning. What is more, the sacrifice is likely to be small, given that the total amount of time devoted to questioning need be only a few minutes out of the whole lecture.

The use of audience response sytems is also discussed in the handbook chapter on Creative uses of in-class technology.

Alternatives to an ARS system

One alternative, also discussed in the handbook chapter on Creative uses of in-class technology, is to use mobile phone text messaging to answer questions posed by the lecturer, to give feedback or to ask questions of the lecturer. Various software packages allow the lecturer to capture text messages and display them on the screen (see the section on mobile phones in the above handbook chapter). As that section states:

"The use of mobile phones in the classroom has the advantage of opening up discussions in situations where most students would not otherwise participate. Students' anonymity and the ability to have more time to think about the question encourages larger numbers of students to participate. Students tend to enjoy the interaction and the activity helps to maintain concentration and focus."

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[1]   R. McG. Harden, , Sir E. Wayne and G. Donald, 'An audio-visual technique for medical teaching', *Journal of Medical and Biological Illustration*, vol. 18, no. 1 (1968), pp. 29–32.

[2]   W. R. Dunn, 'Programmed learning news, feedback devices in university lectures', *New University*, vol. 3, no. 4 (1969), pp. 21–2.

5.2 Case Study 2: The use of lecture time for workshops

John Sloman, The University of the West of England

I was module leader on the level 1 Economic Principles module at the University of the West of England (UWE) for several years in the 2000s. At the time it was a year-long 30-credit module. Students on other 30-credit modules on the programme had 2 lectures per week and 1 seminar (in a group of 20) per week. There were 240 students on the Economic Principles module, and if class contact were to have followed the pattern of the other modules, this would have meant having 12 weekly seminar groups. Total staff hours would have been 14 hours per week.

The material that would be covered in seminars would be a mix of formal theory (such as constructing models and working through graphical and numerical problems) and the consideration of policy issues, cases and other more open-ended questions where there is room for discussion and debate.

The decision was taken several years previously to introduce a third type of class. This was a workshop. Workshops were for the full lecture group in a lecture theatre seating 310. They were taken by two members of staff. Students had 2 lectures per week, 1 workshop per week and 1 seminar per fortnight. Student class contact was thus 3½ hours per week (rather than 3) but staff hours were only 10 hours per week (rather than 14). Workshops were used for technical material or for questions where there is a clear right or wrong answer. Seminars were reserved for discussing policy issues, case studies, debates, small group work, etc.

Students were given 3 lecture hours per week on their timetable but were not told in advance which would be lectures and which would be workshops. They did know, however, that workshops would be based on material covered in lectures.

When students arrived at a workshop, they picked up a problem sheet. This contained a series of questions: graphical, algebraic, numerical problems (set out in sections), multiple-choice questions, making lists, etc. There was room on the sheet for them to write their answers. The students worked through one or two questions, discussing them with their neighbours as they did them. The lecturer then went through the answers from the front. Then the students did another one or two questions, and so on.

The lecture theatre was tiered, and so the students were asked to leave one row free in every three. The students soon got used to this and it was an easy process to organise. Leaving every third row free in this way allowed the lecturers to go round giving help to students if they were stuck. Although such a workshop involves two (or three) members of staff, there only needs to be one experienced lecturer. The others can be graduate teaching assistants (GTAs).

Workshops proved very popular with students and a good medium for learning and applying basic economic concepts. They consistently scored high 'satisfaction' ratings in student questionnaires. There are significant economies of scale in such classes and yet virtually nothing is lost by doing the workshop exercises in such classes rather than in groups of 20. In fact the gains can be substantial:

- Students enjoy the variety of having three different types of class.
- Seminars become very lively and can be much more problem- and issues-focused.
- The workshop format makes efficient use of GTAs. They need a far lower level of teaching skills on the one-to-one basis in which they are helping students in workshops. In fact, it is almost a form of peer support; students like being helped by GTAs who were recently undergraduates themselves.
- The lecturer time released can be reallocated to extra office hours support (again this could be by GTAs) and support in an online environment, such as running a discussion board to answer follow-up questions to the lectures or workshops.
- Workshops can lead directly into extra practice work for students. At UWE, additional 'homework' questions were attached to the workshop sheet, again with space to write the answers. Students handed these in to seminars. As the questions could all be marked simply right or wrong, they were very quick to mark. Tutors did not write comments on the answers. Instead, they stapled a worked answer sheet to the student's homework.

The frequency and total number of workshops that are feasible to run in a department depend on the nature of the module. On 20-credit one-semester

modules, the workshops could be run weekly. On 20-credit year-long courses, or 10 or 15-credit one-semester modules, the workshops could be organised on a fortnightly basis.

Rather than having a whole hour devoted to a workshop, an alternative is to introduce workshop activity into lectures. If lecture hours are increased by 50 per cent, then approximately one-third of each lecture could be devoted to workshop activity, without any reduction in the time for traditional lecturing. The mix of lecturing and workshop activity in each lecture hour could make for a very active learning experience for students.

6 Where next?

Suggested Reading

The majority of existing pedagogical research into the use of lecturing and student learning continues to be generic. The best sources for economics-specific educational research are the journals the *International Review of Economics Education* and the *Journal of Economic Education*.

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