Student Research project

Oral Presentation skills

Done by:
Dr Zine-Eddine Bouras,
Department of Software Engineering,
Faculty of Information Technology,
Philadelphia University, Jordan.
E-mail: zbouras@philadelphia.edu.jo

February 2009

Aims:

To introduce the skills needed to present and defend your project effectively in oral form.

Learning objectives:

When you have completed this chapter, you should be able to:

- o Understand how to structure, plan and deliver effective oralpresentations.
- o Demonstrate your software professionally.
- o Understand the purpose of, and be able to plan for, viva voce examinations.

1 Introduction

One of the most important aspects of any project is being able to present your findings to others. There is no point in performing an excellent piece of research if the results cannot be disseminated. While dissemination usually takes place through written reports and articles (see Chapter 8), quite often you will be called upon to make oral presentations of your work. This chapter will cover the skills needed to make effective oral presentations; how to prepare them, how to structure them and how best to deliver them.

2 Oral presentations

2.1 Introduction

Oral presentations are often an essential part of many degree courses these days. They are frequently used to assess students' understanding of their work and their abilities to present their findings to others in oral form.

For many people, their only involvement or encounter with you and your project will be at your oral presentation. They may be interested in your work from a professional or personal viewpoint or they may be part of the assessment team who are evaluating your work. Whatever the case, you should be trying to interest and inspire people regarding your work and be emphasising your own interest in and enthusiasm for your project.

Two types of oral presentation that you might be involved with, particularly at postgraduate level, are conference presentations and internal departmental presentations. Quite often postgraduate students will be expected to present at internal seminars and, for PhD students, submitting and presenting a conference paper may be compulsory during the course of their studies.

An oral presentation can be compared with an iceberg – most of which is always hidden from view below the surface of the ocean. Like an iceberg, your audience will only ever see 10% of the work of your presentation – the delivery itself. They will not see the other 90% of effort that you put into preparing it. Similarly, of all the material that you obtain, and all the results that you acquire during the course of your project, you might only have time to present the more interesting and most important 10% of detail.

There are a number of considerations that should be made for oral presentations: preparation, the content, visual aids you might wish to use, the delivery of the presentation itself, and how to deal with questions. The following sections deal with each of these points in turn before presenting a few final tips that can help you present your project to the best of your ability in oral form.

2.2 Preparation

The first stage of any oral presentation is clearly preparation. The first stage is to clarify your presentation's objectives, taking into account the audience who will be attending and time you have available (including time for questions). If you don't know these things it is important that you clarify them as soon as possible as they will have a significant bearing on what you decide to include and leave out.

Objectives.

Begin by clarifying the objectives of your presentation – what do you hope to achieve with it and what should your focus be? Will you be discussing your project itself rather than its outcomes? For example, its problems, solutions, how you performed the project and so on? Alternatively, you may be presenting the technical outcomes of your project to a more scientific audience (a conference presentation, for example). In this case, you might address points such as how the work was performed, what supporting research is there, what is its context, what you discovered and what your results were. You should also consider the assessment criteria that are being applied to your presentation (this is not relevant for conference presentations but is important if the presentation forms part of your project's assessment). If so, are the examiners interested in the presentation itself rather than the content? Are they interested in how you form your arguments or state your case? This will clearly influence the way in which you put your talk together.

You can identifie some additional possibilities that might represent the main purpose of your presentation:

- to explain what you have achieved and, if applicable, what you intend to do next;
- to obtain advice and feedback;
- a forum for learning and mutual support;
- as part of your assessment or as a monitoring process.

Time.
You will probably find that your presentation will be required to last from anywhere between ten minutes to half hour. Quite clearly, with only ten minutes for a presentation, you will have to get straight to the point you intend to make, while, with a half hour to play with, you will be able to cover more background and build up to the main point of your talk.

You will need to clarify how much time there will be available for your presentation and how much time there will be for questions. Will you be able to decide on the proportion of time allocated for the presentation and the questions or is this specified? How flexible is this time – is it fixed to within one or two minutes or can you over- or under-run to a much greater extent?

Audience.
The number and type of people who will be attending your presentation will have a significant bearing on its style and content. You should ask yourself these questions: are they assessing you? Are they your peers? Are you hoping to inspire them with your work and persuade them to become involved with it? What do they already know? What do you want to teach them? What do you want to show them?

Now that you have an idea of the objectives, time and audience of your presentation you can move on to preparing the presentation itself. If you are struggling with ideas on what to include, begin by brainstorming ideas and writing them down on a piece of paper. Annotate each of these ideas onto a single piece of paper or peel-off sticker. You can then go about arranging your material into a logical structure – don't just expect to write a few notes down at random and expect to *ad lib* your way through them on the day. Remember that your presentation should have a beginning, middle and an end, and points that you may be trying to get across may need some build-up or explanation first. For example, if you wanted to discuss the application of artificial intelligence techniques to air traffic control scheduling, you would do well to provide some background on these two subjects separately first, before focusing in on the main point of your talk – the overlap of these two topics.

The next stage of your preparation will be to develop the visual aids you want to use. It is stated that people retain only 10% of what they hear but 50% of what they see. Thus, visual aids are important for getting your message across and help your audience to remember what you have presented. Visual aids can include overhead transparencies, slides, white boards and blackboards, computer-based presentation packages, and physical objects that you wish to show or pass around the audience.

With your talk physically prepared, the last stage of preparation is to compose yourself mentally by rehearsing your talk again and again (sometimes in front of a mirror).

You may well find that you have developed too much material or are trying to cover too much detail, so you should prune your presentation to the time available. You must also familiarise yourself with the room and equipment you will be using. You should make sure that you can answer the following questions:

- Do you know how to use the overhead projector (can you access the spare bulb)?

- Can you operate the hardware (the lap top and the projector) for projecting computer images with PowerPoint®-type presentations?

- Do you know how the slide projector works if you are using one? Can you focus it and go forward and back through the slides?

- Do you know which way to insert slides into the slide projector or which way transparencies should be placed on the overhead projector?

You can begin initial rehearsals in the privacy of your own room or in front of a mirror to check things like timing, structure and flow. Try to rehearse your presentation in front of somebody else as well at some stage. Other people can usually spot silly mistakes or places where they feel you aren't explaining yourself clearly. Finally, try to rehearse your presentation in the room you will actually be using for the presentation – you might be able to do this the evening before for a conference presentation or book the room in your department if it is an internal presentation. Make sure that you can use all the equipment that is there.

One cautionary note to end with is that oral presentations can often suffer from *over* preparation. Sometimes presentations appear stilted; the 'off-the-cuff' remarks appear rehearsed, the talk doesn't flow naturally, the speaker appears to be reading from a script rather than talking to the audience. Try not to fall into this trap by

learning your presentation word for word. The audience expects to be spoken to as people, not read to from a script. Remember that they are all individuals and expect to be spoken to as such rather than as an amorphous group.

2.3 The presentation content

All presentations should have three main sections – the beginning, the middle and the end. The purpose of the beginning is to set the scene and tone for the audience and provide them with information about your presentation's content. To cover all the points necessary for your introduction, try applying the *who, what, how, why, when* approach:

- *Who* are you – what is your affiliation, why are you there?

- *What* are you going to talk about?

- *How* long will the presentation last?

- *Why* should they listen to you – why is what you are going to say important and timely?

- *When* can they ask questions – during the talk or at the end?

It is useful to have an introductory slide for these points. You might then like to set the scene in more detail by identifying the specific topics you will be discussing. A slide with the structure of your talk and its content is also useful here.

Having set the scene for your presentation you can move on to the main body of your talk. What you include within your presentation will clearly depend on the points discussed earlier – its objectives, the audience and the time that is available. A common approach for most talks of any reasonable length (20 minutes or more) is to cover three main points during their main body. People can easily retain three main ideas; any more will become confused and mixed in their minds.

You should always conclude and summarise your presentation – never end abruptly. Try to summarise what you have covered; what were the main points you made that you would like people to remember? What are the conclusions from your work? How do you feel the work can be developed in the future? Try to end your presentation on a high. Many people switch off during the main body of a presentation, listening mainly to the introduction and the conclusions. Don't end your talk stating that you wish you'd never pursued your project in the first place. Try to emphasise the main contributions you have made.

Try to make sure that your audience remembers your talk by giving them something to take away with them. This could be a copy of some of your slides but, perhaps more importantly, it should be something distinctive about your talk they will remember – an unusual diagram, an explosive demonstration or some earth shattering results.

2.4 Visual aids

As noted earlier, visual aids come in various types these days: overhead transparencies, slides, flip charts, white boards and blackboards, and computer-based presentation packages. The two most common are the overhead transparency and computer-based presentations based on tools such as Microsoft® PowerPoint®. Although computer-based packages can produce very neat, colourful and dynamic images, without adequate projection equipment they can be useless. The rules for presenting computer-based presentations are much the same as for producing overhead transparencies. However, three other points are worth noting with respect to these kinds of presentations:

- Will a lap top/PC be available or will you have to provide your own?

- What medium should you bring your presentation on? CD-ROM, floppy disk, Zip® disk or memory stick?

- Will you have a back-up available if something goes wrong? For example, will you take overhead transparency slides of your presentation just in case?

Although blackboards and white boards are used extensively within teaching environments, they are not always well suited to presentations. You will find yourself continually turning your back to the audience to draw or write something; you may find yourself talking to the board rather than the audience; and, if your handwriting isn't particularly neat, your jottings may be illegible anyway. However, they can be useful if you have previously drawn or written something on them before you start your presentation or need to develop an idea or a list with audience participation. Having said this, unless you are confident with these media, it is best to avoid the use of blackboards and white boards during presentations.

For overhead transparencies and PowerPoint®-style presentations there are a number of simple considerations that you should bear in mind during their preparation:

- **Detail**. Try to make sure that your slides are not too detailed or too sparse. It is suggestsed 40 to 50 words per transparency can be absorbed in one go, or suggest a maximum of seven lines of text with no more than seven words per line. Large paragraphs should certainly be avoided. Figure 1 provides an example of a slide that is too detailed, containing too much text. Figure 2 presents an alternative view of this slide in which the information has been presented as a series of bullet points that the presenter can talk around.

4.　Software Attributes

Quality of software is reflected by some attributes. The software should deliver the required functionality and performance to the user and should be maintainable, dependable and usable

Maintainability : Software must evolve to meet changing needs

Dependability : Software must be trustworthy

Efficiency : Software should not make wasteful use of system resources

Usability : Software must be usable by the users for which it was designed

---

Figure 1. An over-detailed slide

4.　Software Attributes

- Reflect Quality of software.
- Software should deliver the required functionality and performance
- Software should be:
  - ✓ **Maintainable**: evolve to meet changing needs
  - ✓ **Dependable**: must be trustworthy
  - ✓ **Efficient**: should not make wasteful use of system resources
  - ✓ **Usable**: must be usable by the users

Figure 2. A clear slide

- **Pictures**. Remember that *a picture paints a thousand words*. Try to strike a balance between images and text in your presentation. People are more likely to focus on and remember images than long textual explanations.

- **Font**. Use a clear font of an adequate size. Don't use a gothic font or a size that is so small it cannot be read easily from the back of the room. The way to decide on a suitable font is to try out a sample in the room beforehand. In a smaller room you might well get away with a 14 or 18 point font, but in larger auditoriums you will not.

- **Colours**. Be careful when using colours on your slides. Some colours clash quite badly and others do not show up very well when projected. Once again, experiment to find out which combinations are most suitable. As a general rule, bold, deep colours stand out best of all and contrasting colours between foreground text and background should be used. Computer-based presentations can usually get away with more varied colours than those based on transparencies as the projection equipment used is normally more powerful.

- **Hand writing**. Try to avoid using hand written or hand drawn diagrams on transparencies if at all possible. Word processed and computer-generated transparencies look far more professional and appear much clearer.

- **Multimedia**. If you are performing a computer-based presentation you can also consider including video clips, sound, and computer graphics in your presentation. These can take time to prepare and they can also 'pad out' your presentation when the audience has really come to listen to you. However, there are certain aspects of student projects that can be presented in a better way through multimedia. For example, a video clip of a software system being used in the field; a short animation of some graphics generated by your software package and so on. Be careful when using these multimedia systems (make sure they are portable and will work on the presentation lap top) but be aware that they can 'spice up' otherwise dull presentations.

- **Orientation**. It is often argued that transparencies should be presented in landscape rather than portrait format. This will clearly depend on the content of the transparency. Try to be consistent and stick with a landscape layout if possible.

- **Bullet points**. Some of the clearest slides are those containing a few bullet points which you 'talk around' during your presentation. These points provide focus for the talk and are not so detailed that the audience spends more time trying to read the slide than listening to you.

- **Style**. Try to produce a consistent style for your slides – a consistent background and text colour, a consistent font, a border style perhaps including your name, affiliation and presentation title. A consistent style looks more professional and the audience does not have to keep 'acclimatising' to ever changing formats. If you are using a computer-based system like PowerPoint® you can set up a 'Slide Master' that applies a consistent style across all the slides you produce.

- **Slide transitions**. If you are using a computer-based presentation system like Power- Point®, you can vary the transition from one slide to the next (there are around 60 possible transitions in the system on my machine – varying from 'Blinds Horizontal' to 'Wipe Up'). There are no rules regarding which transitions are the 'best' to use so you should select those that seem most professional to you. You might consider varying the transitions from one slide to the next to make it more interesting for the audience or you may stick with one style that appears more professional.

Two other aids you might wish to consider are handouts and objects that can be passed around the audience. Before you pass out handouts you should be aware of their purpose. If the audience will need to refer to the handouts during your presentation, you should pass them out before you begin. If not, it is best to leave them until the end as they can cause a lot of distraction to you and the audience during your presentation.

Handouts of your presentation can easily be generated with computer-based systems like PowerPoint®. They allow you to put two, four or six copies of your slides on a single sheet of paper (or even note-based pages that have a copy of the slide and a space for making notes). Be careful that your audience does not lose interest in

your talk because they have all they need on the handouts. To avoid this you might like to give the copies of your slides on handouts after your talk is completed.
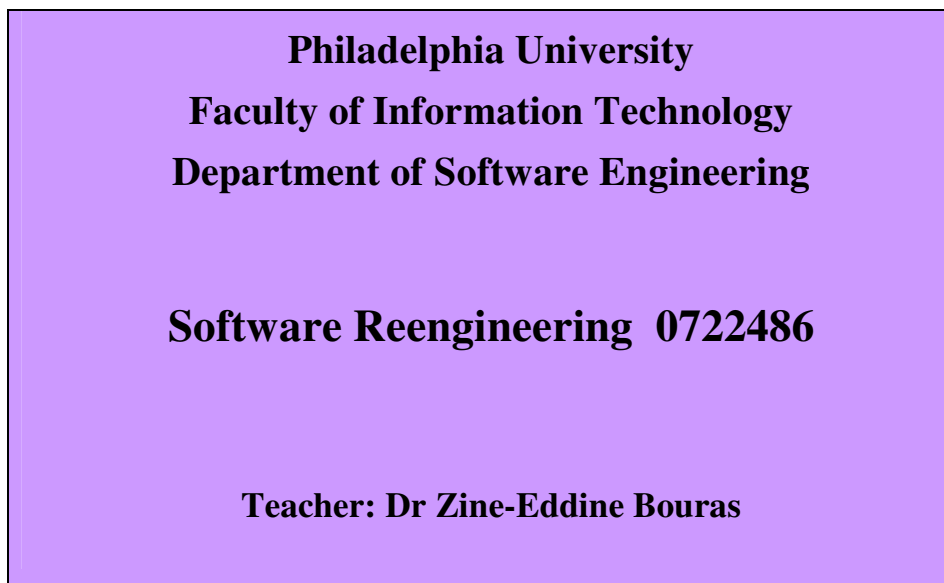
2.5 Slide content

Your presentation should be split into three distinct components:

1. **Introduction** – consisting of one or two slides that introduce you and your talk.

2. **Main body** – the slides that constitute the bulk of your presentation and cover the main points that you wish to get across. How many slides you use within this section will depend on the length of the presentation and the information you wish to convey.

3. **Summary/conclusion** – a number of slides that summarise your presentation and perhaps identify areas of further work.

The introduction to your presentation usually involves two slides (although this can be compressed into one slide for shorter presentations of less than ten minutes). The first slide should present (as a minimum) the title of your talk, your name and your affiliation. You might also include the name of your supervisor(s) if you feel this appropriate and any co-authors of the work. Sponsors and organisations/companies involved with the project might also be included on this slide.

You should consider numbering your slides – so that people can refer to them after the presentation when they are asking questions, and, for transparencies, if you drop them you can soon sort them back into order. Sometimes people also include the total number of slides with the slide number (for example, '1/12' or '1 of 12'). This gives the audience an idea of how much of your talk is left at any stage (which sometimes helps and sometimes does not!). You might also consider adding the date or, in the case of conferences, the name of the conference somewhere innocuous at the foot of each slide. These can make the slides appear more 'personal' to the audience – they have been produced just for them at this conference (despite the fact that you are re-using the slides from another talk you gave some time ago!).

<div style="border:1px solid #000; background:#b19cff; padding:20px; text-align:center;">

Philadelphia University

Faculty of Information Technology

Department of Software Engineering

Software Reengineering 0722486

Teacher: Dr Zine-Eddine Bouras

</div>

Figure 3. An example of an introductory first slide

Figure 3 presents a typical example of an introductory first slide. Note that title, presenter and affiliation are included. You will use this slide to introduce these points as these are things that are easy for you to remember and it helps you to settle into your talk.

The second slide usually presents the structure of your talk as series of bullet points. A typical example is presented in Figure4. This is another slide that is fairly easy to 'talk to' and should also help you settle into your stride.
Your talk then moves into the main body of the presentation.

It is suggested the following slides for the main body of a presentation lasting around 20 minutes:

- Background

- Arguments

- Aims and objectives

- Approach

- Results

The *Background* allows you to introduce the project to the audience. The *Arguments* are those supporting the *Aims and objectives* which are introduced next. There is a slide discussing the *Approach* (and methods) used for the research. The *Results* are presented next. As noted earlier, the content of the main body depends largely on the purpose of your presentation. For a software development project you might be presenting the requirements, designs, some implementation issues and so on.

Figure 4. An example of a slide outlining the talk's structure

The final few slides that you present summarise and conclude your presentation. You may need up to four slides to complete this task. One slide might simply summarise the talk that you have given. For short presentations this is probably unnecessary as people can remember what you have covered. For longer presentations (over 30 minutes) a summary may be useful to bring everything back together for the audience. A second slide might be used to highlight the conclusions of your work – what have you discovered, developed and contributed, for example. A third slide could also be used to present ideas for future work – how your work may be developed and what direction you feel the research should go. This *future work* slide is also a useful starting point for the questions and discussion that inevitably follow a talk. The last slide that you might consider using is an *Any questions?* slide. An example is presented in Figure 5. This is used to complete your presentation; it might provide your contact details again if people are interested and it invites the audience to start asking you questions about your presentation.

Figure 5. An 'Any questions?' last slide

2.6 Delivery

Although you might be well prepared and your visual aids look stunning, a poor delivery can ruin your presentation. Rogerson (1989: 97) identifies a number of factors that can distract the audience from what you are saying during delivery:

- Talking with your back to audience or mumbling. Lots of 'mmms' and 'errs'.

- Not scanning the audience as a whole but focusing on one part of the room only.

- Wild gesticulation – people focus on this rather than what you are saying.

- Irrelevant information or sidetracking from the main point.

- Extraneous noise.

In addition, you might also be trying to cover too much detail in a particular area – perhaps presenting lots of statistics, detailed equations and so on. Many people only remain focused at the beginning, when they are wide awake, and towards the end, when they wake up and try to catch up on what you are saying. Your delivery has a distinct affect on the audience's attention during the main body of your presentation.

- **Scanning**. Make sure that you scan around all the audience during your presentation and remember to talk to people, not just their faces. Quite often you will see two or three people paying close attention to what you are saying, perhaps nodding in agreement or taking notes. You will tend to find that you focus in on these people. It then feels as if you are almost talking to one person at a time, not a large group and this can help reduce your nerves.

- **All clear?** When you put slides onto the overhead projector or you project slides from your computer, make sure that they are clear. Make sure that you are not standing in the way, the slides are the right way up and everything is in focus.

- **Handovers**. If you are involved with a joint presentation, for example as part of a group project, make sure that the handovers to each other are rehearsed and you know the sequence in which you are speaking. It looks very unprofessional for people to end their section abruptly and ask the rest of the group 'who's next?'

- **Voice**. Make sure that you maintain a clear, confident voice throughout your presentation and don't mumble. Take deep breaths, slow down and pause to compose yourself if you have to.

- **Timing**. Make sure that you keep to time during your presentation. Keep a watch or a clock within sight and know the time when you are due to finish. As a general rule-of-thumb you would expect each slide to take at least a minute to present – so, for a 20 minute presentation, 20 slides would be more than enough.

- **Pauses**. Pauses can be used for good effect during a presentation. The audience will pay close attention to what you have to say after a pause, so use them just before you have something important to say. Try not to use too many or they will lose their impact.

One other factor you will want to consider as part of your delivery is how to use your notes. Many people use a series of cards with points set down on each of them covering the content of their talk. Quite often, however, people get ahead of themselves and are seen rummaging through their cards to check what they are supposed to be talking about next. Alternatively, you can have your notes written down on the backing sheet of each transparency you use. These might direct you towards the points that you want to make for that transparency. Another approach is to have one or two sheets of paper nearby with the main points and structure of your talk noted down to prompt you, possibly with lines and arrows to direct you.

It is up to you how much detail you put down on your cards or sheets. With practice, just a few prompting words should be sufficient. At the other extreme, you might want to write down your talk word for word in case you dry up and have to read it out, but this is ill-advised. Although you should make the notes detailed enough so that you know what to say, they shouldn't be so detailed that you have to stop your presentation to read them. A cursory glance should be all that is required for a well rehearsed presentation.

2.7 Dealing with questions

Although you might complete your presentation satisfactorily, quite often the hardest part of an oral presentation is fielding the questions at the end. This is the part over which you have little control. In some circumstances, particularly if your presentation forms part of your assessment, the questioner knows the answer to the question they pose. They are probing your depth of knowledge and ability to convey that knowledge. They are also interested to see how you handle questions and how well you can 'think on your feet'. A few points worth considering that will help you to deal with questions are:

- **Preparation**. Try to think beforehand what kinds of questions you might be asked; will they be technical or more general? What kinds of answers will you be expected to give – extended answers or short answers? Will you be expected to justify or defend parts of your project?

- **Plants**. It is not uncommon for presenters to 'plant' questions with colleagues in the audience. This can help to relax you because you have the prepared answers, and can take up time that might otherwise have been filled with more difficult questions.

- **Confidence**. At all times try to remain confident. You have been asked to speak for a reason, so you are justified in being there and people feel you are worthy to be asked a question.

- **Brevity**. Try to keep your answers brief and to the point.

- **Conflict**. Avoid conflict with the audience. Admit that differences do exist, discuss alternative interpretations and opinions, and try to address things from a higher level. In addition, avoid apportioning blame. If some results came out unexpectedly or some aspects of your project didn't conclude satisfactorily explain why this happened from your perspective. Don't blame person x or person y – your project is your responsibility so justify it from this angle.

- **Clarification**. You should always ask for clarification if you haven't understood a question. Don't try to answer what you think was asked or the question you would like to answer. The questioner will usually probe you further until they receive the response they are looking for.

- **Offer to speak to them later**. If you are really struggling with a question or really don't understand it you can offer to speak to the questioner in more detail later.

- **Address the audience**. When you answer questions make sure that you address your answer to the whole audience. Your presentation isn't over and you still have a responsibility to speak to the entire audience rather than entering an intimate conversation with one individual. In conference situations, the

chair of your presentation's session will often step in if questioning becomes hostile. This is very rare but it does happen on occasions. If you feel you are being victimised or insulted you should ask the chair to intervene on your behalf.

2.8 Presentation tips
To conclude, a few tips are presented that are worth considering to improve your oral presentations.

- **Time**. If you have difficulty keeping to time (either over- or under-estimating), have some spare slides you can 'drop in' or take out of your presentation depending on how time is progressing.

- **Pointers**. Try to avoid using laser pointers. They are never clear and wobble all over the screen you are trying to point at. A much better way is to use a pen or pointer on the overhead projector itself. If you are nervous, place the pen down against the point you are referring to and leave it there. If you are using a computer-based presentation you could use the mouse pointer as a pointing device.

- **Movement**. Many people fidget and move around alarmingly when they are giving a presentation. With practice, you can suppress these urges and learn to avoid annoying habits such as jangling keys in your pocket. If you are going to make a movement, try not to make it an exaggerated one unless you need to do so for emphasis and to demonstrate your enthusiasm. If you want to stop yourself walking around, place a finger on the nearest desk or chair – subconsciously your body will want to remain fixed where you are.

- **Nerves**. Everybody suffers from nerves to some extent or another. While nerves are never totally eliminated, they do ebb as you become more and more used to giving presentations. The tip here is to give as many presentations as possible and practice as much as possible. The more you do, the easier it becomes. Without a few nerves you will not have enough adrenalin to give an exciting presentation. If you are shaking you could perhaps switch the overhead projector off as you change slides.

- **Technical failure**. Overhead projectors are not infallible (the bulbs do blow in them quite frequently) and lap tops linked to projectors do go wrong from time to time. Quite often, projectors have spare bulbs within them that you can switch to; so learn how to do this. Alternatively, have a contingency plan, such as using transparencies if you have a computer-based presentation or moving to a white board or referring to handouts of your slides if you are using an overhead projector. Usually, however, if there is a major technical failure, your session chair will step in to assist you.

In conclusion, above all else, be *enthusiastic*. Enthusiasm can do a lot to hide nerves and perhaps some content lacking from your presentation. The audience will remain on the edge of their seats when they see how interested you are in your work and will become motivated and supportive of you as well.

3 Demonstrating
3.1 Introduction
As a student on a computing course of one kind or another, there is a strong chance that you will have developed a piece of software at some stage. Whether this software is the main component of your project, or whether it is merely a vehicle for testing out and presenting some ideas, you may well have to demonstrate this software to your tutor, your examiner, your peers, a client or some other interested parties. This section discusses ways to prepare for such a presentation, some considerations you should make before your demonstration, and some tips that will assist you.

3.2 Preparation
You should prepare for a software demonstration in much the same way as you would prepare an oral presentation. You should decide on your demonstration's purpose, then plan, prepare and rehearse your demonstration.
When deciding on your demonstration's purpose, ask yourself what you hope to achieve. What do you hope to show and get across to the audience?

Your demonstration should also be planned thoroughly. Structure the demonstration beforehand – don't just expect to 'play around' with your program on the day. Like an oral presentation, it should have a beginning, middle and an end. You should also decide how you want the demonstration to be performed:

- **Solo running**. This involves you running through a particular, planned sequence of tasks on your own, with no interruptions or audience interaction. This approach is not advisable as it might appear that you are 'protecting' your program's weaknesses by merely demonstrating some simplistic features. In other words, any variations to the sequence or the data you are entering might cause your program to crash. Although this might not be the case, that is how it might appear to the audience.

- **Rolling demonstration** – in which the software runs itself through a predetermined demonstration that cannot be interacted with. This might be a demonstration package you have developed rather than the software package itself.

- **Audience participation**. Allowing the audience to request things or suggest examples as you run through the program in a relatively free manner. This is the most common approach to software demonstrations where you have an approximate idea of the functions and options you wish to demonstrate but expect to be directed at times by audience requests.

- **Audience running**. Allowing the audience to play with the software with you guiding them. This approach is suitable for a system that is demonstrating usability and ease of learning.

- **Supporting presentation**. When students perform software demonstrations, they sometimes use two machines. One is for the demonstration of the software; the other is for a short PowerPoint®-style presentation that introduces the demonstration – the project, the client, the format of the demonstration and so on. You can run the presentation and the demonstration on the same machine but there is a risk that your software won't load and run smoothly while the presentation package is still running in the background.

When you prepare your demonstration you should bear three things in mind: *time*, *audience*, *focus*.

- **Time**. How much time is available? You do not want to over- or under-run your demonstration, so careful preparation and timing of actions during rehearsal is important. If you are over-running think about parts of the program that don't really need demonstrating. Can you go straight to the part of the program you really want the audience to see and skip any introductory screens or messages?

- **Audience**. Know who the audience will be – what do they know, want to see/learn? Are they staff, students or a client? What will you have to explain? What is the audience likely to ask you? Will you need to justify primary things such as the choice of programming language used, the algorithm you have decided to use and so on? It may be that you are presenting your software to your tutor but the software is actually for somebody else – an industrial client, for example. Your tutor, therefore, may be more interested in your design, interface development and so on, whereas the client may be more interested in learning how the software works and its functionality and limitations.

The size of group will also have a bearing on your presentation. According to Rogerson (1989: 103), a software demonstration 'to a large group will be more generalised and more high level than that to a smaller group when the interests can be identified and the demonstration tailored accordingly'. The size of audience will also have an effect on the choice of hardware you will need to use. For three or four people, a single monitor might be suitable, but for larger groups you will have to consider using a projection system of some kind or another.

- **Focus**. Concentrate and focus on the good points of your software – not just basic functions such as loading and saving files, printing and so on. Similarly, try to focus the demonstration towards the purpose of your project. For example, if your project aimed to explore human computer interaction issues, concentrate on the software's screen designs, layouts and navigation routes. If it was to implement and test a particular algorithm, focus on the results and outputs from the software and its efficiency.

Before you actually perform your demonstration you should rehearse it thoroughly – preferably on the hardware system you will be using on the day. Make sure that your software will work on the system you will be using – is it the right hardware configuration, does it need a graphics card and so on?

3.3 Demonstration tips
The following points are a selection of tips that will help you prepare and present effective software demonstrations. This list is not exhaustive and the effectiveness of individual tips will depend on the type of demonstration you are performing, the programming language you have used, and the audience.

- If possible, try to set up as much as you can beforehand. People hate to wait around while you load software, set up overhead projectors and so on. If this is not possible, try to practice loading your software somewhere else so that you can load it as quickly and easily as possible. Although your presentation may not yet have started, people can be put off your program before they have even seen it working because it appears to need half an hour to install! Alternatively, be prepared to give a small anecdote, story or some additional information about your program to help pass the time while it loads.

- Make sure that all the audience can see the screen clearly. Is there any reflective light on the screen? Is the monitor clear of smudges and finger marks?

- Know your software's limitations, bugs and faults so that you don't try to do something that your software can't handle. This is also useful if you are to demonstrate a particular aspect of the code in which there are problems, so you don't look embarrassed or surprised when things go wrong. In this case, you can explain that a particular section is still under development or hasn't been thoroughly tested yet. You can also state that the fault/bug is known and is documented on the report!

- Know how your software works and how it is structured. This will enable you to explain these points if asked and will demonstrate your deeper understanding of the code.

- If your software is well written and well structured it may well consist of a number of *stubs*. These stubs are sections of code (components and functions) that haven't been completed but will be developed in the future. Developing a program using a top-down approach to identify its components and functions is a recognised practice and is acceptable providing that the system doesn't crash when it accesses these stubs. In these cases it is usual for each stub to return a message such as 'This function is still under development'. Developing your program in this way improves its maintainability, readability and structure.

- Highlight some additional features you have included that may not be apparent from a straightforward demonstration. For example, if the software asks the user to enter a month number, the software might check that the value is between 1 and 12 (not apparent if they entered 6). These kinds of checks, although included, are not normally evident from a demonstration unless pointed out or questioned.

- Never say – 'Oh, that shouldn't have happened' or 'What's happening now?'

- Be aware of similar software packages. Know the competition and understand how your software compares with (and improves upon) them.

- Practice beforehand. The main point to emphasise is rehearsal. You don't want to run out of time having only demonstrated half of your program and you don't want to come across unexpected bugs.

4 Viva voce examinations
Not only do students often have to present their projects in oral presentations but they also have to 'defend' their project during a viva voce examination (*vivas*).

A *viva* is an oral 'interview' conducted by examiners (one or more examiners may be involved). Sometimes it is used merely to check that the work of the project is your own and has not been done by someone else. Sometimes it is used to clarify some points you made in your report that are vague or unclear. It is more commonly used to assess your understanding, depth of knowledge, confidence and ability to present your project in an examination situation. You should be prepared to defend your project during the examination, justifying why it is important and timely. You should also be able to explain and discuss the contribution that

your project is making. You will not be expected to know your report/dissertation word for word (for example, what is on page 10, paragraph 2), so you should be able to refer to your report during the examination.

In some cases, the viva is used only to upgrade your mark; for example, at undergraduate level, if you are a borderline case the examiner might be looking for a good reason to increase your final mark. At postgraduate level, the viva is used as an additional way of examining your understanding of your project and the subject area and provides further evidence to support your project.

The nature of your course will affect the duration and content of any viva you might have to attend. Vivas can last anything from five to ten minutes. For open ended vivas, generally speaking, the shorter they are the more confident the examiners are with the quality of your work and the less they feel they need to probe you on your understanding.

Who conducts the examination will also be dictated by your course's requirements. At one extreme, it might be little more than a brief chat with your supervisor. For research degrees, it is more than likely that external examiners will conduct the viva, with internal examiners and possibly your own supervisor in attendance. Sometimes examining committees are involved and sometimes the examination is held in public (this is common in Europe). For undergraduate projects, external examiners are unlikely and your own supervisor or another academic within your department will conduct the interview.

Whether your viva is a short interview with your supervisor or the more formal postgraduate viva, you should still prepare for it thoroughly:

- Make sure that you read your report thoroughly beforehand so that it is fresh in your mind. For postgraduate projects, there can often be a gap of several months between the time you submit your dissertation and the time you attend your viva.

- Try to identify any errors, omissions and perhaps shortfalls with your work, so that you are prepared to defend these points in the examination. If an examiner identifies a shortfall with your work of which you were unaware, it can catch you off guard and leave you struggling. If, however, you have identified any problems beforehand, you can perhaps be prepared to discuss why you didn't do something in a particular way or feel that such-and-such a method was inappropriate in your case. You could then move on to emphasise some of the more important findings you made.

- Be aware of the things you left out of your report – references, data, methods and so on. Be prepared to defend your reasons for omitting them.

- Be prepared to discuss future developments to your work. Where do you feel your research is heading? What do you think is the future of your subject area? What topics do you feel are suitable for further research and development? If you are unable to do this you might give the impression that your project has been merely a vehicle for obtaining your degree and you have no motivation towards the work or enough interest to care how it is developed in the future.

- Be prepared to answer quite general questions about your project; 'Tell me about your project', 'Which part of your project did you enjoy the most?', 'Why did you choose to do this project?' and so on. These kinds of questions can often cause more problems than the highly technical questions on specific aspects of your project that you understand in detail and can talk about for hours.

- Make sure that you understand the broader subject area in which your project resides. This will allow you to emphasise the contribution that your project is making and enable you to discuss its context within wider issues.

During the examination:

- Make sure that you defend your project positively. In other words, don't criticise the work of others but focus on the contribution that your own project is making. You should show that you do take the work of others seriously even if you disagree with them.

- Be prepared to answer open questions and give extended answers, not just simple 'yes' or 'no' answers. Ricketts (1998: 25) presents some typical questions you might encounter in your viva that require extended answers. Typical questions include:

- What related research did you locate and draw on?

- What do you feel was the most challenging part of your project?

- What was the most interesting part of your project?

- What is the main contribution your project is making?

- What would you do differently next time?

- What makes you think your project is the right level (scope, breadth, depth, quality) for your course?

- What parts of your work could be published?

- Why did you **not** use methods X, Y or Z?

- Avoid confrontation. Don't argue with the examiners but try to explain your point of view and why you feel things are the way you see them. The examiners will expect you to argue your case, but not aggressively.

Overall, remember not to panic during your viva. The examiners are not trying to catch you out but merely trying to probe your understanding about your work and clarify some of your ideas and the points that you have made. Bear this in mind and think of your viva as an *opportunity* to put forward your own views on the subject and support the work you have accomplished.