

Chapter 3

DEVELOPMENT AND PRODUCTION

Introduction

This chapter provides an introduction to the process of developing and producing audio and associated print materials for distance education and open learning.

By development and production we mean the process of transforming a set of ideas about how to use audio – i.e. the outcome of the planning and design stage – into a form that can be distributed to students as radio programmes or audio cassettes with visual support materials.

The chapter starts from the assumption that you have already decided to use audio; and that you have gone through the basic planning process outlined in the previous chapter. It then goes step-by-step through each of the main stages of transforming your ideas into audio and audio-visual materials that the students can use:

- Preparing programme outlines
- Researching content and contributors
- Commissioning and collecting material
- Compiling audio and support materials
- Drafting presentation scripts
- Rehearsal and recording in the studio
- Post-production editing
- Review and formal approval
- Copying and packaging cassettes
- Storage and distribution to students

Once you have a clear idea of the various tasks involved, you'll be in a better position to decide on realistic schedules for developing and producing audio and related materials – information which you'll need to complete the series outline discussed in the previous chapter. You'll also be better equipped to go on to the next two chapters – which look at the key skills needed in developing and producing audio and printed support materials for distance and open learning courses.

From planning to production

Planning, development and production are obviously closely related and overlapping processes. The decisions you make when preparing your series outline provide a basic framework of ideas within which the process of developing and producing audio materials takes place.

Without good planning it is impossible to produce effective audio for distance and open learning. But without good development and production practices, it is equally impossible to realise even the best made plans for audio.

The role of the producer

The role of the producer is central to developing and producing good quality audio. The producer brings to the task a set of professional skills that are essential for effective communication using sound – including that of coordinating and managing the wide range of activities that are necessary to translate a set of ideas for audio (the series outline), into a set of radio programmes or audio cassettes with printed support material.

However, producers cannot complete this task on their own. Just as planning and design involve the knowledge and skills of a range of people, so does audio development and production. Producers need to work in close collaboration with subject specialists, scriptwriters, contributors, audio presenters, perhaps actors and musicians, and certainly technical staff. The producer's role is to combine, coordinate and direct the team's activities to develop and produce effective audio materials and carefully integrated printed support.

In addition, the audio producer's role often involves close liaison with a number of other people and organisations – for instance:

- With the producers of other media and learning materials – e.g. print, television and video, and computer-based materials
- With national and local broadcasting organisations and the providers of technical facilities and services
- With those responsible for regional and local tutorial and student support services

And all of this activity usually takes place within a context of limited resources and demanding deadlines.

It was suggested in the previous chapter that planning and design benefits from a fairly open and democratic management style, encouraging the active participation of the various professionals in the

team. However, as we move into development and production, the type of activities involved requires a shift towards a more hierarchical style of management. It is difficult, if not impossible, for good audio to be produced by a committee. The closer you get to the studio, the more you need effective leadership and clear managerial responsibility. However, this does not mean that the producer needs to become a dictator. On the contrary, successful production is nearly always characterised by a high level of consultation and consensus building.

This is one reason why some sort of course team approach is valuable in developing audio material (and other media) for distance and open learning. It is also one of the reasons why it is important for audio producers to be involved in the work of the course team from the earliest stages of planning and design. This not only gives the producers a better understanding of the approach being adopted to a course. It also provides an opportunity to contribute ideas on the potential role of audio. In addition, it allows time for mutual confidence and trust to develop between subject specialists and audio producers, which will be of continuing value as the audio material moves towards the production stage.

One area in which agreement is of particular importance is that of editorial control. Who has the ultimate responsibility for deciding on the content and form of the audio material and its supporting print? This question does not normally lead to conflict in an effective course team, in which the different members have had sufficient opportunity to recognise and appreciate each other's specialist knowledge and professional skills. What tends to emerge in such situations is a broad consensus that subject specialists take the main responsibility for matters of curriculum and content, while the expertise of producers is recognised in relation to the form, format and style of audio presentation. And where there are differences, they tend to be readily resolved.

Stages of development and production

The particular process through which audio is developed and produced will depend on the type and complexity of the learning materials you're working on. A simple 10-15 minute radio talk usually involves less work than a complex 20-30 minute documentary or drama programme, or an audio-vision package using a range of audio forms and substantial printed support.

However, in most audio productions – whether radio, audio cassettes or audio-vision – it's possible to identify a series of key stages in the development and production process. As we indicated at the beginning of the chapter, you may find the following ten-point sequence useful.

Ten stages in the development and production of audio

- Preparing programme outlines
- Researching content and contributors
- Commissioning and collecting material
- Compiling audio and supporting materials
- Drafting presentation scripts
- Rehearsal and recording in the studio
- Post-production editing
- Review and formal approval
- Copying and packaging cassettes
- Storage and distribution to students

Looking through this sequence of key stages in development and production, it soon becomes clear that:

- Many of the tasks are overlapping
- Different people are involved to different degrees at each stage of the process
- The amount of time and effort required at each stage will vary with the complexity of the materials being developed and produced

These are some of the issues we'll touch on as we work through the list step-by-step. We'll look at the first item in some detail. The remainder we'll deal with more briefly.

Preparing programme outlines

In the previous chapter, we looked at the preparation of general series outlines, covering the provision of audio for a whole course. Here we focus on preparing detailed outlines for the individual radio programmes or audio cassette sequences which form part of a series. For this task, we use the same checklist and the same five headings we used for series planning in the previous chapter. But this time we'll adapt them to the detailed planning and design of individual programme and audio cassette sequences.

1. Audience

You will have already prepared a general audience profile at the series planning stage. Here you need more specific information, linked

to the particular subject matter of an individual programme or audio cassette sequence:

- What level of knowledge and/or skills will the students have achieved by the time they listen to the audio material?
- What assumptions can you reasonably make about what they know already, what they can do, and what they need to learn?

In formal courses (usually print-led), this generally involves relating the audio to the students' progress on the printed course materials. In non-formal courses, you will often need to obtain specific information on the students' knowledge, attitudes and practices in relation to the topic of the audio material. (These are often called KAP studies – knowledge, attitudes and practices.)

- How much of this information do you have already?
- What do you need to find out?
- What sources of information are available to you?

2. Aims and objectives

At the series level, we usually develop general aims and objectives for the use of audio within a course. Now you need to identify specific objectives for a particular programme or audio cassette sequence. What exactly do you want your students to learn from the audio and associated print material? Again you may find the knowledge–skills–attitudes checklist useful.

- What knowledge do you want the students to derive from the audio?
- What new skills or competencies do you want them to develop?
- What attitudes and values do you want the students to think about and explore?

You may find it helpful to express your objectives in behavioural or competency-based terms – i.e. in terms of what the students should be able to do as a result of their audio-based study, which they could not do before.

For instance: 'After listening to the audio material, the students should be able to...' – followed by an observable activity, e.g. identify,

describe, distinguish between, demonstrate, analyse, explain, solve, select, apply, evaluate...and so on.

Beware of words and phrases like 'be aware of', 'appreciate' and 'understand', the evidence for which is often difficult to observe directly. Obviously we do want students to be aware of, appreciate and understand. But rather than trying to observe them directly, we need to look for activities or indicators that show that awareness has been raised or that something has been appreciated or understood.

Also, don't limit yourself to short-term learning gains. Be aware of longer-term learning processes. Much of the knowledge you'll be teaching, and many of the skills and attitudes, will not be acquired immediately during an audio-based study session. Learning often takes longer. Knowledge needs to be applied before it is internalised. Skills need to be practised. Attitudes and values need to be explored and tested.

In this sense, audio – like other media – is usually a stimulus to longer-term learning, rather than a vehicle for immediate learning gains. For this reason, it's important in drafting your objectives to take account of longer-term follow-up activities, usually included in the printed support material.

Some benefits of clear objectives

- They enable you to think more clearly about what exactly you want to achieve through the use of audio and supporting printed material.
- They provide clear criteria for selecting relevant audio and print material, and rejecting irrelevant or unnecessary material.
- They help you find out how successful your audio and print have been in doing what you wanted them to do. They also help you identify specific areas of success or failure and suggest how the materials can be improved.

3. Content and structure

The series planning stage identified broad areas of subject matter for audio, decided on the order of presentation and related audio to the other media components of a course. This is often presented as a series of titles for programmes or audio cassette sequences, perhaps with brief notes on what each will contain.

Here we move from the 'macro' to the 'micro' level – deciding on the content and structure of individual radio programmes or audio cassette study sequences. If you have defined your objectives clearly, identifying relevant content should not be difficult. As we noted above, your objectives should give you clear criteria for inclusion and exclusion of subject matter and related audio and printed materials.

Nor should structure present too many problems – at least in the sense of deciding on a logical and coherent order in which to present the subject matter. In formal courses, this will often be determined by the order of the topics in the printed texts. In non-formal courses, the subject matter itself will often have a fairly self-evident internal logic that will make the ordering of the material relatively straightforward.

However, there is another sense in which the term 'structure' is often used – namely, in a pedagogical or instructional design sense. This refers not only to sequencing, but also to the way you present audio and print materials to students.

Here the question of whether you are delivering the audio material by radio or on cassettes becomes important. Because the technology differs, each of these media has its own disciplines in terms of how you structure and present audio material to students. This is a question to which we'll return in the next chapter. For the moment, it is sufficient to think of structure in terms of the order or sequence in which you are going to present the subject matter to the students.

4. Form and format

You will have already decided (as part of series planning) whether to use radio or audio cassettes. And you may also have made some preliminary decisions about what forms and formats are likely to be most effective.

We discussed the range of forms and formats in Chapter 2, where we also suggested some of the main ways in which they can be used in distance and open learning. Here you need to apply this knowledge to the particular subject matter you are dealing with in the audio material you're planning.

- Which audio forms and format are likely to be most appropriate to the subject matter and the audience?
- How can you combine and vary these forms to give the audio material interest, variety and pace?
- How should you present this material to the students? Is there a role for an audio tutor? What will this involve?

5. Support material and activities

This is also a subject we discussed at some length in Chapter 2. At the series planning stage, two basic decisions should have been made:

- First, whether you are planning to combine and integrate the audio with some sort of printed/visual support material
- Secondly, if so, whether the support material will be included in the main course text (e.g. in a formal course), or presented as a separate booklet or study pack which will accompany the audio (which can be done for either formal or non-formal courses)

Once you've made these basic decisions, you can go on to the detailed planning and design of support material for the radio or audio cassette sequence you're working on. In either case, you'll probably find the simple 'before-during-after' approach useful.

Checklist for preparing support material

Before listening

- If students are following a print-led course text, how far should they have progressed before listening to this particular piece of audio?
- More generally, what would it be useful for students to have read, looked at, reviewed, thought about or discussed, before listening to the audio?
- What activities will help them prepare for and get the most out of the audio material?

During listening

- What would it be useful for students to look at while listening? What visual material would extend the scope of the audio material, add to the experience of listening, and help student concentration?
- Are there other things that students could usefully do while listening – e.g. examining objects, carrying out tasks, making notes or reacting on paper to what they're hearing?
- In the case of cassettes, should you encourage students to stop the tape at particular points, so that they can test their understanding, apply what they're learning, practise skills, and reflect on attitudes and values?

After listening

- What follow-up activities would students find useful after listening?
- How can newly acquired knowledge and skills be applied or practised?
- Are there attitudes and values that it would be useful to explore through discussion and debate?
- How can the longer-term influence and effects of the audio material be supported and reinforced?

Your responses to these questions will determine the type of support material you will need to develop and produce – for instance:

- As part of the main course text (e.g. in formal print-led courses)
- As a separate audio booklet (in formal or non-formal courses)
- As a set of visual materials (e.g. flip-chart illustrations, usually in non-formal courses)
- Or as a combination of the different types of the support material suggested above

We will look at some of the practical questions involved in developing and producing these materials in later chapters.

Presenting detailed outlines

One way of presenting detailed radio or audio outlines is to adapt the approach suggested for series planning. First, make a note on how far the students should have progressed in their studies when they listen to the audio:

- What level of knowledge and/or skills will they have achieved?
- What assumptions can you make about what they know already, what they can do, and what they need to learn?

Then organise the rest of the information in four related columns, as follows:

Specific objectives	Content and structure	Form and format	Support materials and study activities
[Specific objectives to be achieved through the individual radio programme/audio cassette session.]	[A list of the subject matter/topics to be covered, linked to one or more of the specific objectives.]	[For each topic, an indication of the type of audio material you are planning to use.]	[Support material and study activities – before, during and after listening to the audio material.]

As you develop this outline, you should start to hear the programme or audio cassette material in your head. You should also try to imagine yourself in the position of the students listening to and learning from the material.

- What will the students be listening to? How will they react to it?
- What will they be looking at or doing – before, during and after listening?
- What will they gain from the experience? How will it help their studies?

As with the series outline in Chapter 2, the detailed outline suggested above – sometimes called a ‘running order’ for audio material – will be a basic working document for the development of individual radio programmes or audio cassette sequences.

- You can add to it and amend it as your thinking develops.
- It serves as a basis for communication between the different people involved in and affected by the development and production of the audio material.
- It can also incorporate your collective agreements about the purposes of a specific piece of audio and how it’s going to be used.

This is clearly an important document. It serves as a blueprint and guide for the rest of the development and production process. And it’s for this reason we’ve looked at it in some detail here. The remaining stages we can deal with rather more briefly.

Researching content and contributors

This stage involves identifying and selecting key contributors and suitable audio materials for the radio or audio cassette material you are working on – writers, interviewers and interviewees, participants in panel discussions, actuality and archive material, drama and music – depending on the type of audio material you are preparing.

This is an activity that is undertaken jointly by subject specialists and audio producers:

- Subject specialists will clearly take responsibility for the professional credentials and credibility of the contributors.
- Audio producers will be concerned with the capacity of the contributors to communicate well, and the technical quality of the sound.

At this stage, it is important to be ambitious on behalf of your students. Aim to provide them with the best quality audio materials available – in terms of both the subject matter and the technical quality. At their best, distance education and open learning have now achieved a good deal of status and prestige. You should therefore be able to attract the highest quality of contributors to your programmes. You should also be able to gain access to the places and situations you want your students to experience. Don't be afraid to use the senior staff of your organisation to assist you in gaining the access and cooperation you need.

At the same time, be realistic about the resources you have at your disposal – e.g. time, money, transport, technical support. Often this will require you to make compromises between what you would ideally like and what is practically possible. However, don't settle for easy options. Be imaginative and resourceful. Go for the best quality of material you can get with the resources at your disposal.

Enterprise and imagination in Tanzania

The HESAWA project in western Tanzania (see Chapter 1) produced four audio series on health and water education. Each series consisted of 10 x 30-minute dramatised audio cassette programmes. The project did not have access to professional scriptwriters, actors or studio facilities. Despite this, good quality audio drama was produced, which was enjoyed by its village-based audiences and proved educationally very effective.

Each series of programmes was produced by a four-week workshop attended by 16 local health, water and education officers, assisted by an experienced audio producer.

- The storylines were developed and the drama improvised by the workshop participants, none of whom had previous experience of audio or drama.
- The programmes were recorded on location, using a portable open-reel tape recorder and a single microphone.
- Multiple cassette copies were produced by a local music store, which also serviced the cassette players provided on loan to the 200 village-based study groups.
- The workshop participants, assisted by a graphic artist, also produced a set of flipchart illustrations and an illustrated booklet to accompany each series.

All of which shows what it's possible to accomplish with minimal resources. Similar approaches – again with minimal resources – were adopted by the University of Fort Hare in South Africa, by SOLO in Sudan and by NITEP in northern Uganda, brief details of which are given in Chapter 1.

Commissioning and collecting material

Once you have identified and selected key contributors, you need to approach them, provide a briefing on what you want them to do, and – if they agree – offer them a contract for the work they will undertake.

Initial approach and briefing

When approaching a potential contributor, you need to indicate:

- Who the material is intended for
- What it is designed to achieve
- How the material will be used by students
- What exactly is expected from the contributor
- The timescale for the development and production of the material
- Any payment that will be offered for the contribution
- Plus any other information the contributor needs

This is one of the reasons why having a detailed outline for audio material is useful. The outline will provide you with all the basic information you need for a full and effective briefing.

Contracting

Once someone has agreed to contribute to the audio material, there is a strong case for issuing a formal contract or letter of agreement covering the work they have agreed to do. This document will usually indicate:

- The nature of the work to be done
- The time within which it should be completed
- Any payment that will be made for the work

In addition, the contract will also normally include provisions on how the audio material can be used, on what happens if either side fails to fulfil its obligations and on how any disputes relating to the contract will be settled. Once the contract has been signed, it becomes a legally binding agreement between the contributor and the organisation producing the audio.

This type of formal contract may seem unnecessarily legalistic within an educational context. However, issuing such a document has the advantage of:

- Defining clearly what you expect of your contributors
- Indicating when and in what form you expect it
- Spelling out any financial arrangements involved in the agreement

This can avoid acrimonious disputes later on. It can also provide you (metaphorically speaking!) with a stick with which you can beat your contributors if they don't deliver on time.

Payment and results

Some institutions pay contributors once they have finished the work. Others find it useful to pay fees in two or three instalments. For instance:

- An initial payment on signing the contract – which motivates them and creates a moral obligation to complete the work on schedule

- A second payment when they've completed their contribution – which encourages them to deliver on time
- A final payment when the audio material has been completed and approved – which means they are still available for final revisions

Alternatively, you could have a simpler system, with half the fee being paid on signing the contract, and the other half when the work has been completed.

But whichever system you adopt, it's important that fees are paid promptly and on time. Otherwise, contributors will soon lose their eagerness to work for you and their commitment to the project.

Generating and collecting material

When your contributors have been contracted, the next task is to generate or collect the material. Depending on the type of audio material you're developing, this process can involve both subject specialists and audio producers in a wide range of activities:

- Planning and writing scripted talks and designing support material
- Commenting on and editing other people's draft scripts and support material
- Rehearsing and recording scripted talks in a studio or on location
- Planning, setting up and recording interviews and panel discussions
- Recording actuality, sometimes with commentary and analysis
- Casting, rehearsing and recording audio drama and simulations
- Rehearsing and recording specially commissioned music

We'll be looking at some of the main skills involved in developing and producing these different types of audio and support material in the next two chapters.

A note on copyright

You may also be involved in locating, selecting and negotiating the use of a variety of pre-recorded sounds – e.g. archive material, sound effects and commercially recorded music recordings – some of which will involve copyright payments.

The law relating to copyright – and the extent to which it is observed and enforced – varies from country to country. It is not possible, therefore, to give country-specific advice in a handbook such as this.

However, it is important for you to be aware that some of the pre-recorded audio material you want to use may require copyright clearance and the payment of fees to the copyright holders. You should take professional advice on the requirements of copyright law in your own country. Failure to do so could result in you and your institution suffering serious legal penalties.

Compiling audio and support materials

Once you've generated and/or collected the audio and support materials you need for your radio programme or audio cassette sequence, the next task is to select, edit and order the material for presentation to the student.

Selection

Very often, when you've recorded or collected the material you need for an audio presentation, you'll find that you have more than you can accommodate within a radio transmission slot or on a cassette. You may also find that the quality of some of the material – pedagogically or technically – is less good than you would have hoped for.

In either case, you need to decide what to include and what to drop. Here again, clearly defined objectives will help you make your decisions.

- What material is essential to achieving your objectives?
- What can you drop without damaging the effectiveness of the audio material?
- What needs to be excluded on professional or technical grounds?

These decisions are not always easy. Both subject specialists and audio producers can become very protective of audio material they have generated or collected. However, the disciplines of the media require us to learn to let go of material that is less essential or not of sufficiently good quality. Once we've made these decisions, we implement them through editing.

Editing

In the case of scripted materials, you can edit them on paper before recording. However, unscripted materials (e.g. interviews, discussions, actuality, improvised drama) cannot be edited in advance – though they can (and should!) be carefully planned. In these cases, editing follows recording.

Three main reasons for editing

- To make sure that the content of the audio material is exactly what you want
- To improve audibility and the clarity of communication
- To ensure that the audio material fits into the time-slot available to you

Audio editing is partly a technical task requiring the skills of a producer or technician. But it is also an editorial task, involving decisions about the inclusion and exclusion of content, which are mainly the responsibility of subject specialists. So, for both technical and editorial reasons, audio editing is usually undertaken jointly by subject specialists and producers working closely together.

Three ways of editing audio

In a physical sense, there are three main ways of editing recorded audio material:

- **'dubbing'** (copying) – generally used when editing audio cassette material, or when open-reel recording tape is in short supply
- **cutting** – a more precise method involving physically cutting and re-joining open-reel recording tape
- **electronic editing** – i.e. editing digital audio tape (DAT) using a computer with appropriate audio editing software

These are important practical skills which give subject specialists and producers a high level of control over the audio materials they are producing. We shall return to them in more detail in Chapter 5.

Ordering

Decisions about the order in which you present material to students will usually have been made at an earlier stage, as part of preparing the detailed outline for an audio presentation. However, once you've completed the selection and editing of the audio material, it is worth looking again at the order in which you are presenting the subject matter. At this stage, you may find that, as a result of selection and editing, you can improve the impact and effectiveness of the audio material by modifying or re-arranging the order in which you present it.

Once selection, editing and ordering have been completed, then an 'insert tape' can be prepared – i.e. a tape of pre-recorded and edited material, arranged in order of presentation, ready for use in the final studio recording. However, before such a recording can take place, an audio presentation script has to be drafted.

Drafting presentation scripts

So far, we have been mainly concerned with the 'raw material' of a distance education radio or audio cassette programme – the scripted talks, interviews, discussions, documentary and dramatised materials that you want to present to your students as a stimulus or support to learning. Here we turn to the question of presentation. How can you present the audio materials to your students in such a way that they get the maximum benefit from them?

Presentation is particularly important in distance and open learning. For students to get the most out of audio, they need to know:

- Who or what they are listening to
- Why they are listening – what they can expect to gain from it
- How they should listen – what they should look at or do while listening
- How the audio material fits in with other parts of the course
- What they can do to follow up and reinforce the audio experience
- When they should listen again and what they should expect to hear

It is possible to present this information in printed notes accompanying the audio material; and it's useful for the students if you do this. As we suggested earlier, such notes can provide a useful reminder of the

content of the audio and may also be helpful for revision and preparing for exams.

However, there is also a strong case for including the information as part of the audio material. It provides the students with a second source of information, closely linked to the material they are listening to. More importantly, it does so in a direct and personal way. It allows the student to hear his or her teacher, talking directly, personally and (hopefully) with understanding and enthusiasm, about the audio material that is being listened to.

Roles of the audio tutor

The presenter of audio material – or the ‘audio tutor’ – has a number of important roles to play:

- Introducing the audio material, and explaining its aims and objectives
- Linking audio to other parts of the course – print, TV/video, tutorial support
- Introducing contributors and alerting students to what they should listen for
- Directing students’ attention to visual materials and study activities
- Drawing out the main teaching points to be gained from the audio
- Suggesting follow-up activities and providing feedback and tutorial support
- Providing continuity and coherence within and between audio-based study sessions

The specific way in which the audio tutor’s presentation script is drafted will depend on the type of audio material and whether it is being broadcast on radio or distributed on cassette. This is a question that will be considered in the next chapter, together with notes on the layout of scripts and their presentation in the studio.

Rehearsal and recording in the studio

Once your pre-recorded audio material is edited and ready, together with any associated print or visual materials, and when the audio tutor’s presentation script has been finalised, then it’s time to take the radio programme or audio cassette sequence into the studio for

rehearsal and recording. Or occasionally, in the case of radio, for 'live' transmission.

Roles and responsibilities in the studio

There are four main roles and sets of responsibilities in the recording studio:

- **Radio/audio producer** – who takes overall responsibility for the direction and management of the studio session, and of the rehearsal, recording and professional quality and standards of the audio material
- **Contributor(s)** – those who are taking part in the final recording of the audio material – e.g. the announcer, audio tutor, and any other people who are contributing
- **Technician(s)** – who are responsible for setting up and preparing the studio for rehearsal and recording (checking recorders, microphones, acoustic etc.), operating the equipment, mixing and balancing the sound, and delivering professionally acceptable sound quality
- **Subject specialist/adviser** – a member of the course team, who can advise on matters of professional quality in relation to the content of the audio and printed support materials

Ideally, the studio script should have been circulated in advance to all those involved in the recording. In this way, they will have had a chance to familiarise themselves with the form and content of the programme. This allows audio tutors to get to know the script in advance and to practise their own part in it. It also gives technicians advance warning of any special requirements for the studio session. For a complex recording, it's useful for the producer and technician(s) to meet in advance of the recording session, to discuss any technical difficulties involved in the production.

What happens in the studio?

Once all the participants have arrived, there is a fairly standard sequence of events for rehearsal and recording:

- **'Taking level'** – when the technician checks and balances the sound levels of the pre-recorded insert material and studio microphones. The technician also decides (with the producer) whether 'equalisation' would improve the quality of the various sound sources. The technician records these decisions on the studio script so that they can be implemented during the recording. This stage also provides a useful opportunity to check the order of the insert tape and compare the opening and closing words or sounds of each band with those recorded on the script.
- **Rehearsal** – which provides an opportunity for the audio tutor to practise the presentation of the script; and for the technician(s) to rehearse the mixing and balance of the recording. During the rehearsal, the producer's main role is to listen carefully to the performance of the audio tutor and any other contributors, to offer constructive criticism and advice, and to encourage and promote the highest professional and technical standards. The rehearsal is also a good opportunity to check the timing/duration of the script; and if necessary to adjust it accordingly.
- **Recording:** If the rehearsal has been well conducted, the recording should be straightforward. As indicated above, the producer's main role is to manage, direct and monitor the recording. The technician(s) are responsible for delivering good quality sound. The audio tutor (and any other contributors) should then be able to concentrate on communicating effectively with the students. And the subject specialist/adviser is there to make sure the content of the audio material is of an acceptable professional standard.
- **Playback and checking:** Following the recording, at least part of the final version should be played back to check the technical quality. This is also a good opportunity to do any minor editing that may be necessary to tidy up the programme. Usually, the audio material will have been timed (at least approximately) during the recording. However, if there is time at the end of the session (and if the programme is fairly short), then it's a good idea to use the opportunity to take an accurate timing of the final version.

Post-production editing

Even after a carefully prepared, well organised and efficiently managed studio session, some further editing may be necessary. There are several reasons why this may happen:

- It's often difficult to predict or keep exact timings for complex studio productions. So the programme may over-run, and need to be made shorter to fit the time-slot available.
- Often, the effectiveness of the presentation can be improved by further editing – e.g. by making some of the pauses longer or shorter, or by editing out repetitions which prove unnecessary when you hear the whole programme.
- Sometimes, despite the best efforts of the producer, audio tutor and subject specialist, errors are made in presenting the script, which can be corrected by judicious editing.

Three main reasons for post-production editing

- To ensure the radio or audio cassette material is of the right length
- To improve the audibility and educational effectiveness of a programme
- To correct any errors that may have been missed during script editing or studio recording

However, too much reliance on post-production editing should be avoided – for the following reasons:

- Because it's time-consuming;
- Because there are limits to the improvement you can make by editing
- Because it suggests that the planning, preparation, presentation and production of the programme could be improved

If it is possible to get the audio material right during the final studio recording session, so much the better!

Review and formal approval

In many distance and open learning institutions, audio and other materials are subject to a process of review and formal approval before they can be made public and distributed to students. This process is sometimes carried out by the course team or by the department responsible for the course. Sometimes it is the responsibility of a specially appointed body within the institution – e.g. a Course Approval Committee which has to review and approve all new courses produced by the institution.

Whatever the composition of the review body, it usually has three main functions:

- **Editorial review** – to consider and comment on the content and presentation of the audio and support material; to ensure that they are accurate, up-to-date, accessible and at an appropriate level; and to suggest ways in which the quality of the materials might be improved.
- **Professional review** – to consider and comment on the educational and professional standards of the material; to check that they conform to the highest standards of professional practice in distance/open learning media production; and to advise on how the production and presentation of the material might be improved.
- **Technical review** – to consider and comment on the technical standards and quality of the material; to check on the clarity and audibility of the sound and on the design of the supporting printed/visual material; and to suggest ways in which technical procedures, practices, standards and quality might be improved.

It is clear from the range of functions outlined above that the review body needs to have a broadly representative and professionally experienced membership. It would normally consist of:

- One or more senior subject specialists, with substantial knowledge and experience of the subject matter being taught
- One or more senior staff from the media production departments – with knowledge and experience of audio and the other media being used
- One or more representatives of the course team responsible for the planning, development and production of the material

In addition, the review body would benefit from the services of an independent chairperson – probably a senior figure within the institution, but without direct involvement in the departments producing the materials.

A number of options are open to the review body:

- It can approve the audio and supporting print materials
- It can approve the material, subject to certain conditions
- It can approve the material, with recommendations for future action
- It can reject the material, and insist that it either be dropped or re-made

In most cases, provided the materials have been carefully planned, developed and produced, the resulting audio and print package is likely to be approved. However, the decision of the review committee is not the only matter of interest. Its comments and observations can also be of interest and value, particularly in guiding the development and production of future audio and support materials. In this sense, the review procedure can usefully be seen as part of the formative evaluation process.

In those (hopefully) rare cases where audio material is rejected by the review committee, the production team clearly has a serious problem. Re-making audio and its supporting materials is costly and time-consuming. It also plays havoc with budgets and production schedules. For this reason, in planning the development and production of audio, it is important to build in contingency factors, both in terms of staff time and budgetary allocations. We shall return to this question when we consider scheduling below.

In the case of radio, once the programme has been formally approved, it is ready for storing prior to transmission and student use; though it may also be necessary to draft continuity announcements for the transmitting radio station. However, in the case of audio cassettes, two further stages need to be completed before the students can use the material – copying and packaging, and storage and distribution.

Copying and packaging cassettes

There are two main ways in which multiple cassette copies can be made from the master open-reel tape that emerges from the final studio recording session:

- If an education institution or a local commercial enterprise has invested in appropriate equipment, multiple cassette copies can be produced directly from the open-reel master tape. This produces high quality copies at high speed. But the substantial investment in the equipment is only justified if very large numbers of cassettes are to be produced.
- However, it is more common, particularly if smaller numbers of cassettes are required, to produce first a master cassette copy from

the studio master tape; and then to use this as the original for high-speed multi-copying on more modestly priced equipment. This produces slightly less good quality copies; but they are generally of an acceptable standard, particularly if most of the material on the cassettes is speech-based.

Institutions and projects need to decide which of these two methods to adopt. In either case, there are some general guidelines that can be adopted in relation to the copying and packaging of audio cassettes.

Some guidelines on copying and packaging audio cassettes

- It is important to use good quality cassettes produced by reputable manufacturers –in terms both of the quality of the tape and of the cassette mechanism.
- C60 and C90 cassettes (giving 60 and 90 minutes of playback time) are probably the best to use. The tape on C120 cassettes (two hours of recording) is too thin for repeated use, and likely to twist and break.
- It is worth using the more expensive chrome oxide (Type II) tape for master cassette copies. But the cheaper 'Normal' (Type I) tape is generally acceptable for student copies.
- Dolby NR (noise reduction) should not be used in copying, since many students will not have this facility on their cassette players, and using Dolby will result in increased 'tape hiss' when they are listening to the cassette.
- It is important to sample and check the quality of the cassettes regularly during the high-speed multi-copying process.
- Also, make sure that the cassette copying equipment is regularly serviced and maintained. This applies especially to the cleaning and de-magnetising of the recording heads on the cassette copier.
- Once sufficient cassette copies have been made, then they need to be adequately and accurately labeled. Information can either be printed directly onto both sides of the cassette, or printed on specially designed labels that are attached to the cassette. In either case, provided sufficient information is given, this makes it unnecessary to produce printed inlay cards and the cassettes can be distributed in clear plastic boxes.

- The following basic information needs to go on the cassette: the name of the institution or project, the title of the course and/or programme of studies, and (if there is more than one cassette for a course) its number in the sequence. It's also important to label the sides of the cassette (usually A and B) and it may be helpful to indicate what material is on each side.
- A typical cassette label might look something like this one suggested for the Bangladesh Open University

Bangladesh Open University
School of Social Science, Language and Humanities
Bachelor in English Language Teaching (BELT)

Cassette 1

Side A

ELB 1503 – English Language Teaching and Learning
[Further information – e.g. Module Number and Title]
© BOU, 1997

Storage and distribution to students

When the cassettes have been copied and labeled, they should then be stored in a relatively cool, dry and clean place, ready for collating and joining up with any other materials that form part of a course – e.g. audio notes, printed study texts etc. - ready for distribution to students.

In some institutions and projects, the binding/packaging of printed materials is done in such a way that audio cassettes can easily and conveniently be included with the print. One way of doing this is by incorporating a plastic envelope (for the cassettes) in the cover of the printed material. Another is to enclose the cassettes in a folder or box that also contains the printed materials.

Audio cassettes can be distributed in a variety of ways, depending on local circumstances. Whether they form part of a larger learning package, or whether they stand on their own, they will probably take one of the following routes:

- They can be distributed by post to the individual students.
- Alternatively, if the postal service is regarded as slow or unreliable, or if it is not accessible to some students, or if the package of learning materials is unusually large, a courier service might be used.

- In some cases, particularly in larger organisations, materials are sent to regional centres and then on to local study centres, where they are collected by students, either on a pre-arranged date or when they are attending one of their regular tutorial sessions.
- Another method is for tutors or study group leaders to collect the materials at one of their induction or training sessions and then to pass them on to their students when they return home.
- And in some cases, students collect their materials from the headquarters or regional centres when they attend weekend courses, residential schools or examination sessions.

All of these methods can work effectively. What's important is to find one that works well and reliably for your students in your own local situation – and at a price which you and your students can afford.

However, even in the best designed systems, it's inevitable that some audio cassettes (as with other materials) will get lost, damaged or stolen. Audio cassettes are perhaps particularly vulnerable, since they can easily become detached from their accompanying printed materials. They can also be damaged by poor quality cassette players. And – unlike most other learning materials – they also have commercial value, in that they can usually be re-used for other purposes, most commonly music recording.

Three main consequences follow from this:

- First, in estimating the number of cassettes needed, in addition to those required for students, tutors and institutional use, a percentage (perhaps 5%?) should be added to cover wastage – e.g. accidental damage or loss, or (very rarely we hope!) theft.
- Secondly, before distributing the cassettes, the appropriate plastic 'tabs' should be removed, to prevent accidental (or intentional!) re-recording – except in specific circumstances, when you want to encourage the students to re-record on the cassettes, e.g. to practise language skills, undertake assignments or provide feedback on some aspect of a course.
- Third, sets of replacement tapes should be held centrally, or at regional or local centres, which could be provided to tutors and registered students (perhaps for a nominal charge, or at cost price) if and when they need them.

One final question arises – namely, whether an institution or project should attempt to recover and re-use audio cassettes, once students have completed their courses. An economic argument could possibly be made for this in terms of cost savings. However, a stronger counter-case could probably be made, in terms of the administrative costs of recovery, checking and re-using audio tapes, and the inherent dangers

to audio quality in such a procedure. It therefore makes more sense to build the costs of the audio cassettes into the overall cost of producing course materials, and allow the students to keep their audio cassettes – along with the printed materials – as a (hopefully welcome) reminder of their time as a student.

Scheduling development and production

Now that we have reviewed the main stages of the development and production process, we can turn to the question of scheduling, and also complete the series outline discussed in the previous chapter.

- How long will development and production take?
- Over what time period should the activity be spread?
- When should the process start?

Scheduling is a topic on which it is difficult to generalise. It depends on a number of factors, including the following:

- The number of subject specialists and producers involved, their motivation, energy and experience, and the resources and facilities available to them
- The amount, nature and complexity of the audio and support material being produced
- Whether the audio component is to be transmitted on radio or distributed on audio cassettes
- The extent to which the audio materials are integrated with other distance education media – e.g. printed texts, TV/video etc.

However, there are a few general statements about scheduling we can make with some degree of confidence.

- We can make rough estimates of the amount of time it will usually take subject specialists and producers to develop and produce different types of audio material with printed support.
- We can also usually determine two key dates: (a) the latest date by which radio programmes have to be transmitted or audio cassettes have to be distributed to students; and (b) the earliest date we can start work on developing the materials. These dates will give us the limits within which we can design our schedules.
- We also know that complex programmes take longer to produce than simple programmes; and that the greater the level of

integration between audio and other media, the longer the development and production process is likely to take.

Armed with this information, we can now begin to look more closely at scheduling.

How long does development and production take?

One way of approaching this question is to take the ten development and production tasks we identified above, and make a rough estimate of how long each task is likely to take – building in a reasonable allowance for unanticipated delays and contingencies. Assuming that an overall plan for the series (series outline) has been prepared, we can make rough estimates of the time required as follows:

- Preparing detailed programme outlines (say half a working day)
- Researching content and contributors (say one day)
- Commissioning and collecting materials (say two days)
- Compiling audio and print materials (say one to two days)
- Drafting presentation script (say one to two days)
- Rehearsal and recording in the studio (say half a day)
- Post-production editing (say half a day)
- Review and formal approval (say half a day)
- Copying and packaging cassettes (usually no course team time needed)
- Storage and distribution to students (usually no course team time needed)

That adds up roughly to about seven to nine working days for one radio or audio cassette programme, plus printed support material. Of course, not all programmes will take the same amount of time. As we suggested earlier, a simple 15 minute scripted talk will usually be quicker to produce than a complex 20-30 minute documentary or magazine programme. Also, experienced subject specialists and producers will usually work faster than new ones.

Implications for scheduling

What these estimates mean, in effect, is that for fairly simple 15-20 minute audio programmes, with straightforward support material, you should probably allow about one working week (five working days).

For more complex audio material, requiring a lot of location recording and tape editing, or more elaborate support material, you should probably allow up to two working weeks.

In addition, you should probably add on some time for unforeseen delays – e.g. unavailability of contributors, sickness, family and other commitments.

Simpler programmes can usually be produced in sequence – with subject specialists and producers completing one programme before going on to the next.

More complex programmes tend to take longer to set up and produce, with the work being spread over a longer period. As a result, for more complex programmes, subject specialists and producers often find themselves working on more than one programme at a time, with each programme at a different stage of development.

When should development and production start?

We suggested earlier that there are two key dates which set the limits within which we can prepare development and production schedules:

- The radio transmission date or the date by which audio cassettes have to be distributed to students. This defines the end point of the schedule. It is the last date by which audio production has to be completed.
- The earliest date on which it is possible for you to start work on developing the audio and support materials – often defined by progress on the printed component of a course, by the completion of the audio series outline or by freedom from other commitments.

By definition, the development and production process must take place within the time-frame prescribed by these two dates. The end-date – when the audio material has to reach the students – is usually easy to determine. However, exactly when development and production needs to start will depend on a number of other factors. We can illustrate this

through a series of examples – starting with a simple example and then making the situation more complicated.

Basic guidelines for scheduling

- Start from the date by which the audio material has to reach the students.
- Estimate how long it will take to produce the audio and supporting print.
- Work backwards from the distribution date, to establish the **latest** date by which you have to start work on the programmes.
- Look at audio's relationship to other media, and any other relevant factors, to decide the **earliest** date by which you can start production.
- Design a schedule which allows you to deliver the audio material on time, and which starts as early as is practically possible.

Example 1: A simple radio series

Assume you are working on a fairly simple radio series, consisting of 24 x 15-minute weekly radio programmes. The programmes are designed to provide tutorial support for a formal course. The printed text for the course has already been produced; and there are no special notes to accompany the radio programmes.

How long before transmission would you need to start work on developing and producing the radio programmes?

In theory, you could develop and produce each of these programmes in the week before transmission. This is because:

- They are fairly simple programmes
- The printed materials which they support have already been produced
- There are no special notes to accompany the series

However, such a schedule would be a bit risky. It doesn't allow any time for contingencies – sickness, equipment failure, transport problems etc.

It would be safer to complete the production of each programme at least two or three weeks before transmission. If you wanted to, you could of course produce the programmes even earlier; though this would limit your scope for including up-to-date news and information in the programmes.

Example 2: Simple audio cassette material

Now take the same example – 24 x 15 minutes of audio, providing tutorial support for a formal course, with the printed text already available. But this time, assume you are distributing the material on cassette.

What would be the implications of the shift from radio to audio cassettes for the scheduling of the development and production of the material?

Instead of producing 24 x 15-minute weekly radio programmes, you will be producing either six C60 or four C90 cassettes (360 minutes of audio). The production process will still take 24 weeks. To this, you should probably add on a further three or four weeks for contingencies.

In addition, you'll need extra time for multi-copying, labeling and packaging the cassettes. You'll also need to allow time for combining them with the printed materials and dispatch to students – say another four to six weeks? That means that the total development, production and distribution time will be 31-34 weeks. So the process must start at least seven or eight months before the students are due to begin their work on the course.

It would of course be possible to send the materials to students in batches – for instance, two batches of twelve weeks work, or three covering eight weeks each. This would not affect the time required for production; but it would mean you could start the production schedule later. You could be working on the second or third batch of cassettes while students were using the first batch. However, you would also have to take into account that this would involve the institution in additional dispatch costs – which could be substantial if large numbers of students were enrolled.

Example 3: A more complex illustration

Assume you are still dealing with a 24-week course. But now the course team has decided – at the series planning stage – to use audio in a more demanding way. It is still planning to provide on average 15 minutes of audio material per week. But it is proposed that:

- Audio will draw on a wide range of forms and formats (talks, interviews, actuality, drama); that most of the material will be recorded on location and need editing; and that the material will be presented by an audio tutor.
- The audio will be closely integrated with the printed text for the course – which will include preparation for listening, illustrations and exercises for use with the audio and suggested follow-up activities.
- The audio material will be on four C90 cassettes which will be delivered to students with the printed text at least one month before the course is due to start.

So far, work on the printed text for the course has not started. But it is expected to take about two years to plan, write, edit, produce and distribute the printed materials to students - with the time roughly allocated (by months) as follows:

Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 13-15	Months 16-18	Months 19-21	Month 22	Months 23-24
Plan and commission	Write first drafts	Review first drafts	Write second drafts	Review and revise second drafts	Prepare final version	Produce printed material	Delivery to students	2 months contingency

Given the situation outlined above, what sort of schedule would be needed for the development and production of the audio materials for the course? When should the process start? And how should it proceed? How will the work on audio materials relate to that on the printed text?

There is no 'correct' schedule for this type of planning activity. Several possible approaches could be adopted. The purpose of the example is to get you thinking about what is involved in scheduling, and the sort of issues faced by distance educators in a fairly realistic situation. What follows is one approach to developing a schedule for this type of situation. You might be able to suggest alternative (and better) approaches.

First, we know that the audio material needs to reach the students, together with the print, at least a month before they are due to start studying. This gives you your starting point. Now work backwards from that.

As with the print, you will need a month for delivery to students. And it would also make sense to build in a two-month contingency period. In addition, you will need another, say, one month for multi-copying, labeling and packaging, and combining the cassettes with the printed materials. So that means you should aim to complete audio production at least five months before the students are supposed to start studying, though that includes the two months contingency time we have built in.

So how long should you allow for the development and production of the audio material? We know that the audio material is more complex than that in the earlier examples. It uses a wider range of forms and is closely integrated with the printed material. So development and production is likely to take longer.

Let's assume that each 15-minute audio segment will take on average about one-and-a-half weeks – i.e. 7-8 working days. That means that producing the audio and supporting print material would take about 36 working weeks (24 x 1.5 days) or about eight-and-a-half months. So development and production work must start at least 13.5 months (5 + 8.5) before the students are due to start using the materials – or just over a year before they receive them.

So if that is the **latest** date by which development and production has to start, what is the **earliest** starting date that is possible? We know that the audio and print materials are to be closely integrated. This means that the initial planning of the audio can (and should) start at the same time as the initial planning and commissioning of print – i.e. about a year earlier than the latest date by which audio development and production has to start.

Once the initial joint planning of the print and audio has been completed, it will then be possible to go on to development work on the audio material – preparing detailed outlines, selecting contributors, writing and collecting insert material, preparing the accompanying visuals, and so on.

However, given the close integration of audio and print, it would probably be unwise to start finalising audio scripts and recording final versions of the audio material until the main teaching text has at least reached its second draft stage – e.g. months 13-15 (review and revision of second drafts) in the print schedule above, or even better months 16-18 (preparing final versions). In this way, it will be possible to make accurate and precise cross-references between the audio and printed materials.

What this suggests is that, if audio and print are to be closely integrated, we need to develop an audio development and production schedule which is closely linked to that for the printed materials. One possible pattern might be as follows:

PRINT								
Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 13-15	Months 16-18	Months 19-21	Month 22	Months 23-24
Joint planning print and audio	Write first drafts	Review first drafts	Write second drafts	Review and revise second drafts	Prepare final version	Produce printed material	Delivery to students	2 months contingency
Prepare detailed audio outlines	Identify and select contributors etc.	Develop insert material	Develop insert material	Select, edit and order inserts	Finalise studio scripts and visuals	Final recording and copying	Deliver to students	2 months contingency
Months 1-3	Months 4-6	Months 7-9	Months 10-12	Months 13-15	Months 16-18	Months 19-21	Month 22	Months 23-24
AUDIO								

There are several important points to note about this type of integrated scheduling:

- The planning of audio is integrated with that of the printed materials right from the start.
- The development and production process for audio is phased – first planning for the whole audio series; then development of insert materials; and then finally presentation script and studio recording. Further detailed schedules will be needed for each of these phases.
- The development process for print usually takes longer than that for audio. In the early part of the schedule (e.g. months 7-12) audio can be developed at a fairly leisurely pace. Later in the schedule (e.g. 16-20) audio activity is much more intensive.

In addition, once you've mastered the idea of scheduling, you should be equipped to go back and complete the scheduling item in the general series outline which we discussed in the previous chapter. On the two remaining headings, there's more on resources in the chapters which follow, and monitoring and evaluation will be dealt with in the final chapter.

Checklist on the development and production of audio

By the end of this chapter:

- You should have a clear idea of the roles and responsibilities of subject specialists and producers in the development and production of audio for distance and open learning.
- You should also be aware of the main tasks involved in the development and production of audio, the type of activities they cover, and some of the main questions and issues to which they give rise.
- In addition, you should be able to use this knowledge to work out realistic and practical schedules for the development and production of audio materials for distance education and open learning students.

However, knowing about the development and production process is not the same as being able to accomplish the tasks which it involves. To do so, you need to acquire a range of practical skills. We introduce some of the basic skills involved in audio in the next four chapters.