
UNIT 1 THE PROCESS OF COURSE PREPARATION

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1.0 OBJECTIVES

After going through this unit, you should be able to:

- describe the stages of text preparation;
- describe the different approaches to the writing and preparation of a course;
- recognise the importance of coordination and the method of management;
- identify major difficulties in course preparation and suggest some ways to overcome them; and
- manage the preparation of a study unit or, on a larger scale, a full course.

1.1 INTRODUCTION

Course preparation in distance teaching comprises various stages: course planning, course writing, printing the text, etc. Production of radio and television programmes and audio-video cassettes also comes under course preparation. However, in this unit we shall discuss the preparation of *printed* materials only. Preparation of course materials for media other than print are discussed in course ES-318.

Although we have chosen the preparation of teaching materials in print as the focus of our discussion, we shall not go into the details of every aspect

of course preparation. The reason is obvious: each aspect is to be considered in separate units/blocks. For instance, course design has been thoroughly discussed in block 2. In this block we have five units. We have discussed the process of course preparation in unit 1. The process of editing and role of language has been explained in unit 2. Unit 3, describes the phases of course maintenance and revision. We have focused on the quality assurance in open and distance learning materials in unit 4. Unit 5 presents some of the applications of new technologies in the preparation of texts.

The purpose of this unit is to present you an overall picture of the various processes of course preparation. We focus here on the process of 'preparing' of course materials for self-study. In this unit, we only look at printed text materials—written words and still pictures, since print text is the most commonly used medium in distance education.

1.2 COURSE PREPARATION: THE PROCESS

Even today in developing countries, some of which have already been practising distance education for more than thirty years, self-learning materials for distance learners are not always prepared by those who teach them. Therefore, discussing the basics of course preparation will be of immense use for all who are directly involved in preparing texts for distance education.

1.2.1 Need for self-learning materials

Teaching a learner through self-learning texts is different from any other kind of teaching. The kind of writing required for such materials is quite different from that used in writing a lecture or an article for a journal. In distance learning situations, what is most vital is to keep the 'learner' in mind and imagine that we are tutoring an individual learner. As writers, we would like the learner to remain engaged in activities which go beyond text-book learning, and gradually to become more open and critical in his/her approach to the subject-matter. What might be the characteristics of such ideally useful learning materials? We may answer this question by suggesting what such materials should do. They should:

- i) help the individual learners find their way into and around the subject by repeating the content in different ways and at different stages,
- ii) tell them what they need to do before going through the material,
- iii) make clear what they should be able to do on the completion of the material (i.e., in terms of objectives).
- iv) advise them how to tackle the work (i.e., how much time to allow for different sections, how to plan for an assignment, etc.),
- v) explain the subject-matter in such a way that the learners can relate it to what they already know;

- vi) encourage them sufficiently to make whatever effort is needed in coming to grips with the subject,
- vii) engage them in exercises and activities that make them work with the subject-matter—rather than merely read it,
- viii) give the learners feedback on these exercises and activities enabling them to judge for themselves whether they are learning successfully, and
- ix) help them to sum up their learning at the end of the unit.

1.2.2 Course planning

It is necessary to plan the writing of a course carefully and well in advance. In face-to-face teaching, it is easy to make on the spot adjustments in teaching strategies which will suit the needs of different groups of learners. In distance teaching, this is not possible. The teaching material is prepared in advance, and the distance learners don't have the teacher with them to help them interpret its content. So the suitability of the materials must be decided before they are written. For this reason, systematic planning is essential in preparing distance education/self-learning material.

We can consider the question of systematic planning at two stages. First we have to decide the overall planning of the educational project, which includes the decision about the place for written materials within the scheme. Secondly, we should plan the production of materials. We discuss the first stage here, and the second stage will be discussed under the heading 'Course Development'.

Whether or not you have taken part in course planning, this unit will help you learn more about the planning process. There are a number of possible approaches to course planning, and the one we present here is only one of them.

The process of course planning comprises the following stages:

- i) **Assessment of needs:** The first stage of planning is the assessment of educational needs. Defining educational needs is basic to determining the policy of the institution concerned. When we talk about educational needs, we have in mind education in its broad sense. By saying that an educational need exists, we mean that there is the lack of something which an educational programme can help to provide. For example, adult farmers may want to further their education to increase their agricultural productivity but they may do not have the facilities to do so. Or even if the facilities are available, they may not be able to use them because of certain constraints such as shortage of time, or a difficult location.

Educational needs are assessed through surveys and formative evaluation. Various research techniques can and should be employed for this purpose. This is particularly true of rural areas

where people may not be able to solve their problems in educational terms, i.e., a general desire for better health may indicate a need for health education but the exact form of it should be determined through specially mounted studies. We shall consider two general approaches which have proved useful in the assessment of educational needs. The first is similar to anthropological field work; the researcher stays with the community and observes their behaviour. The second is the survey undertaken to find out prevalent needs. Through individual or group interviews, the potential learners, their parents and/or other members of society are asked to answer certain questions.

If you are running an institute which offers courses on health, agriculture, etc., agencies requiring your help will come to you with their specific needs. In such cases, the assessment of needs becomes relatively easier. In other circumstances, user agencies such as Ministry of Agriculture, Health or Education of Cooperative Organisations can be approached to find out the need of the courses.

Once the needs have been assessed, a clear and detailed plan for the project must be chalked out. This requires a description of the project/course, indicating the problems that are anticipated. We should know everything about the potential learners, such as their learning characteristics, their living, educational backgrounds, and their occupations, etc. At the planning stage, we must stress the importance of analysing the entry behaviour of the learners, i.e., what they already know, and what they can do at the start of a course. A detailed statement of the entry behaviour helps us both to plan writing and to give guidelines to the course development team, which consists of the writer, the editor, etc.

- ii) **Defining objectives:** The second step is to specify the objectives, i.e., to set down precisely what we wish to achieve. This definition of objectives should be the key document for course developers. It is a difficult but crucial part of the whole process of developing materials, since later decisions will depend on the way the objectives have been defined and whether they are relevant to the learners' context. There are three main problems in the process of specifying the objectives:

These problems arise because it is necessary to:

- a) decide and identify the most important objectives that determine the success of the course.
- b) formulate/state objectives in precise and comprehensive terms. As objectives are used in evaluating the quality of materials as well that of learners performance, they should not allow alternative interpretations.

- c) spell out objectives precisely which is not always possible.

However, objectives must be stated clearly without any ambiguity and as far as possible, should be expressed in behavioural terms which can be tested and quantified.

- iii) **Analysing resources and constraints:** Before going for more detailed plans, we must have a clear idea of the resources we can depend on, and the constraints we will have to take into account.

In the first place we should keep in mind the budgetary provision for the course. All the expenditure must fall within the budget at our disposal and we must set out our objectives accordingly.

Secondly, we have to consider the availability of media. How much or what percentage of the course will be covered by text materials? How much face-to-face contact is necessary? Do we have broadcasting facilities? Are sufficient electronic gadgets accessible? These are some of the questions that have to be looked into at the planning stage. These considerations have direct and important implications for course design.

The third factor is the delivery and reception of teaching materials. We have to distribute teaching materials to learners, and therefore, have to think about the possibility of approaching them through postal services, regional centres or any other available means.

Taking all these factors into consideration, we may have to modify our priorities and the overall objectives we had originally set for ourselves.

- iv) **Alternative methods and selection of criteria:** At the next stage comes the selection of alternative ways to meet the objectives. This includes:

- Preparation of an outline of requirements e.g., media, administrative arrangements, etc.
- Studying the forms of the materials and their relationship with each other (i.e., whether the audios and videos are integrated or supplementary or complementary).
- Choosing of the evaluation procedures.
- Selection of suitable strategies to achieve the objectives.
- Defining the criteria by which to choose between alternatives, including learner preferences, educational effectiveness, cost, timing, risks and policy.

One of the important decisions we have to take is concerning the choice of media. Which medium will be most effective in achieving

the objectives? And how can different media be brought together to achieve a common goal? Generally, print is used in the form of informative booklets, while radio and television programmes may be used to help the learner to work through the course. In case there is no printed material available, broadcasts may be used as the main means of sending the messages or information. For example, in the rural radio forum, a group meets to listen to radio programmes and discuss them. During SITE (Satellite Instructional Television Experiment 1975-1976) community television was used to telecast messages of family planning and educating the rural masses about the problem of population explosion in India.

At IGNOU, efforts are being made to see that each block is accompanied by audio and video tapes. All the components will thus be supplemented and complemented by each other.

- v) **Developmental trials:** It is obviously ideal to try out a course as a pilot programme before it is finally printed. Even if it is not feasible to try out all the self-learning material in a pilot version, it may be possible to try out part of it on a small group of learners and to draw upon their reactions to improve the course material.

After incorporating the modifications suggested by the learners, the course may be given its final shape, and sent it for printing.

- vi) **Evaluation:** Evaluation/assessment may take two forms:
- a) *Assessment of courses by learners themselves:* A brief questionnaire seeking information regarding the quality of the study units may be sent along with the materials, and the students asked to respond. The responses received should provide an idea of the strengths and weaknesses of the materials from the point of view of the students. Improving study materials on the basis of such analysis is bound to enhance their pedagogic value.
 - b) *Assessment of courses by another person (Tutor, Trainer or Counsellor):* Over a period of time, it is necessary to evaluate courses and see how far they are meeting the educational needs which they were identified in the beginning. It should be possible to design worksheets on a course so that the tutors, may provide some information about its effectiveness. Tutors and course-writers can make use of such information at a later stage when they want to revise the courses. We shall elaborate on this theme in the last unit of this block.
- vii) **Feedback:** Feedback is of crucial importance at each stage of the process of developing teaching materials. The reactions of learners are used to make the text more suited to their needs. The assumption

behind the concept and collection of feedback is that there is usually no single perfect solution to a problem, and that even if there is one, we are unlikely to find it at the first attempt. So we can use 'feedback to the learner' in order to help him/her with the next stage of his/her work and can use feedback from him/her in our effort to develop better self-learning materials.

The learner needs some standard to measure his/her own answer to the self-assessment questions. He/she lacks the immediate response normally provided by a tutor or a group of fellow learners, and so the text must itself include a response. Usually, we need to include not only correct answers but also a discussion of 'why' these are correct and what makes other answers wrong. Discussing through an answer in this way is what the good classroom teacher does all the time. The learner who is still uncertain can then be directed back to the relevant section of the text.

In this section we have discussed course planning, and concentrated on the first stage of course preparation as a process. We have tried to keep our discussion as brief as possible.

Check Your Progress 1

List the stages of course planning.

- Note:** a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of this unit.

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1.2.3 Course development

The second stage in the process of *course preparation* is called *course development*, and it pertains to the actual *writing* of the course materials. The essential aspects of this process are discussed in the following paragraphs under three sub headings: i) Arranging the topics, ii) Preparing unit outlines and iii) Writing the text.

- i) **Arranging the topics:** The first task in course writing is to arrange topics in a logical sequence, which should be based on the learner's

present knowledge of the subject. Thus, a course should start at a point which all the learners who have opted for it will be comfortable with it. So the opening sections should be of an elementary nature.

From this starting point, the subject-matter should proceed step by step. Each step should take the learner a little further on and help him/her consolidate his/her learning through some activities before he/she goes to the next step. While on a topic, we should introduce it, explain it and reinforce it sufficiently before going on to the next one. As a general principle, all the topics of a course should be roughly similar in terms of content density, learner activities and length. For the sake of convenience we shall denote the *textual body* covering a *topic* by the expression *study unit* or simply '*unit*'.

- ii) **Preparing unit outlines:** Having arranged the topics in a logical sequence, the next step is to prepare outlines for individual units. We need to plan and structure each unit in such a way that the learner experiences a minimal learning load while absorbing the content maximally.
- iii) **Writing the text;** the entire textual material of a study unit may be broadly divided into the following sections: opening section, the main body of the text and the ending of the unit.
 - a) *Opening section:* The opening section of a unit should help the learner approach the content, preferably on the basis of his/her previous knowledge or skill. This section includes:
 - The title and the number of the lesson/unit — the title should contain the fewest possible words to describe the content of the text.
 - The outline of the unit content presented as *unit structure* or simply as *structure*.
 - The statement on the unit objectives which can be expressed in different ways explaining what the learners are expected to do and learn, as they should know where we are trying to lead them.
 - An introduction which explains in brief the content of the units. The introduction is a crucial part of the unit. It must be attractive and encouraging and must make the learner feel that he/she can manage the rest of the unit. Besides providing adequate motivation to the learner, the introduction should provide appropriate information and guidance with regard to the skills or knowledge a learner needs to have in order to comprehend the content properly and easily.

- b) *Main text/body*: The main text comprises the actual thematic content of the unit, and is based on learning activities. It refers to other sources of information available. The relevant references include text books, audio-video programmes, earlier units and so on.

Active learning: To sustain the motivation of the learners, we need to ensure that the text is based on an active approach to learning and that the learning activities are diverse enough to maintain the learners' interest. These activities enable the learners to perform various educational acts from thinking to carrying out scientific experiments. They help learners comprehend and retain the information and knowledge obtained from the unit.

Language and style: Language and style are also important factors since they help to make a text effective, if they are used with care. We should use simple language and avoid long, unfamiliar words, double negatives, the passive voice and other difficult structures, unless they are demanded by the text. Common words should be used in a straight-forward way to avoid creating any confusion in the learner's mind.

The language of a unit should be as warm and friendly as possible, and the style conversational for which the learner should be addressed directly.

Illustrations: The insertion of illustrations and diagrams in the main body of the text makes the content clearer and more comprehensible, and prove can helpful to the learners by informing them about the points made in the text or by reminding them of what they have already learnt.

- c) *Ending*: The last part of the unit should summarise all that has been discussed in the unit, and supply feedback on all the activities carried out so far. Thus, the learner is prompted to revise whatever is important in the text.

Assignments are given out at the end of a unit/block and the learners are asked to send their responses to the tutor for marking. Tutor comments, which are sent back along with the evaluated responses, help learners prepare for their final examinations besides improving their understanding of the units.

1.2.4 Course production

This is the last stage in the process of the preparation of materials. It includes the production of both audio-visual and printed materials. The course management group has a limited function now—it monitors the progress of production till the materials are delivered to the learners. Audio-video production is also undertaken along with the production of

Preparation of Texts

print materials. The multi-media package thus prepared is sent to the learners to be used in their own time.

Audio and video production has been discussed elaborately in course ES-318. Here, we shall touch upon a few aspects of the production of materials.

Editing: Editing is one of the most important stages in the process of text production. Editing will be discussed in detail in unit 2 of this block. Generally, an editor performs the following tasks: he/she

- i) ensures the soundness of the text, including the density and the correctness of content,
- ii) prepares manuscripts for printing,

Layout: This includes consideration of the size and type of font to be used, the page size, the number of columns, the nature of margins, placement of pictures, etc. in order to make each page of the unit attractive and learner-friendly.

The other stages in the process are:

- assigning art work to artists,
- typing the text, and
- proof reading

Printing: Printing is an elaborate industrial process. We don't intend to dwell on this theme since the institutional academic staff may not be involved in it directly. We have, however, discussed some of its managerial aspects in the next section.

Despatch: After printing the material, it is stored in the institute's warehouse from where it is despatched to learners at the scheduled time.

Check Your Progress 2

List three stages in the process of text production.

Note: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of this unit.

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1.3 MANAGEMENT OF TEXT PREPARATION

Since distance teaching institutions depend heavily on printed materials, one of their main jobs is to prepare teaching materials in print. If the materials are not prepared and printed as per the schedule, the institutions will have operational and administrative problems. As a course develops from an idea to a set of printed materials, it goes through a process consisting of many stages. It is important that each person involved in this process is aware of his/her functions and responsibilities, and is sensitive to the needs of other members of all the departments to be aware of the constraints within which course preparation takes place. In this section, we shall examine the preparation of printed materials for teaching and learning.

In some institutions, all the activities connected with course preparation are carried out within the institutions by their own staff. In others, some jobs are carried out by outsiders (part-time course writers, for example), while others are looked after by associated departments within the institutions. Most distance education institutions fall under the second category, where some work is done externally. In order to ensure the smooth progress of numerous stages of course preparation, it is essential for all the members concerned to act as a team.

1.3.1 Planning a course

After taking the decision to start a course, its content is to be planned. The first question we now encounter is: who decides the content? In general, the content is planned by the 'course consultative/planning team' which also decides the content density.

For formal courses leading to examinations, the first step is to outline the syllabus indicating what the *content* must be. Once the *content outline* is made available, the process of course preparation enters the second stage, i.e., *course development*. There are six categories of people who are involved in course development:

- a) The academic staff of the institution
- b) The course writers
- c) The media producers
- d) The editors
- e) Subject specialists from other institutions
- f) The learners/students

In the case of non-formal education, planning a syllabus is more difficult since there are usually no available models to go by. Such planning generally depends on the assessment of educational needs which are identified through research. Once the needs are identified, the institution has to work out a plan to meet those needs through its courses. In such cases, it is not unusual to seek support from development agencies such as

various ministries to identify the educational needs of various types of learners.

This approach to course planning has three implications. First, it emphasises close interaction among the agencies concerned. Secondly, it requires a reasonable lead time which will be longer than that meant for a formal course. Thirdly; it points to the need for the services of highly professional personnel — the course developers/writers who should be pedagogically competent besides being researchers, writers and editors at the same time.

1.3.2 Writing a text

The job of a course writer is to develop texts in the appropriate format. He/she may do this either at the individual level or by working in a team.

As an individual, he/she may be a part-time or a full-time course writer. *Part-time writers* are selected from various colleges and educational institutions engaged in teaching the same subjects to students with similar backgrounds. They are basically teachers and are engaged part-time to do certain writing tasks for the distance education institutions.

Advantages of appointing a part-time course writer:

He/she is a teacher who is knowledgeable about the latest developments in his/her subject/discipline and the practical possibilities of teaching it, using new techniques.

He/she can try out any idea he/she intends to implement through distance education.

The distance teaching institution can employ the writer on a temporary basis too.

Disadvantages

Sometimes it is difficult to find an adequate number of good part-time writers.

The part-time writer is trained in face-to-face teaching, and so he/she may not be suitable for distance teaching. Besides, the institution has limited control over him/her, so s/he may not respond to the institution's demands, or may work at his/her own pace without bothering much about the urgency of work or the problems of the institution.

As s/he takes on the additional responsibility of writing for distance education institutions, it is very difficult for him/her to do justice to both jobs. The job of a part-time writer ends once the study unit is written. S/he

may not contribute to the revising, updating and improving of the content to suit the distance learner's needs.

On the other hand, a full-time writer is appointed on a permanent basis, will be on the institution's payroll and will be accountable to the authorities involved in carrying out education at a distance. Even in this case there are advantages as well as disadvantages.

Advantages: It is easy to recruit or find a full-time writer. As s/he is appointed on a full-time basis s/he can complete the work in good time and is likely to maintain the production schedule.

S/he can make long-term plans, and he/she knows the course as a whole, he/she can update and adapt various parts of the course in response to the learner's experience and reactions. It is easy to offer on-the-job training to the full-time course writer.

Disadvantages: Sometimes it is difficult to find the right person to be recruited on a full-time basis. Once appointed, he/she may have problems due to a lack of technical experience or competency to carry out the special tasks involved in distance teaching.

Check Your Progress 3

Compare the advantages of having part-time and full-time individual course writers.

Note: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of this unit.

S.No.	Part-time writer	Full-time writer
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We have discussed the case of a single writer appointed to write a course. Now, we shall consider the idea of using a *team of writers* for the same purpose. Through a *course team* we can overcome many of the disadvantages of a single writer writing courses. A course-team is generally developed by open universities or distance education institutions where course writers who specialize in different subjects come together. The team may include the following among its members:

- i) Convener/Chairperson: He/she is responsible for the overall quality of the course.
- ii) Course authors: These are subject experts who are responsible for writing texts/units, devising practical exercises, preparing assessment material, etc.
- iii) Media producer(s): Media experts produce audio-visual materials.
- iv) Educational technologist(s): Experts in instructional design who help in improving the teaching and the learning (e.g., defining objectives, choosing appropriate teaching strategies for optimum learning, etc.) as well as the quality of study materials.
- v) Editors: Experts who help the writers in ensuring that the texts are linguistically correct and also in ensuring the consistency of the content.
- vi) Graphic designers: They advise the team on layout, typeface and the overall graphic design of the text.

Advantages of having a Course Team

- As the work is shared by the members of the team, courses can be produced according to set schedules more easily.
- Discussion and mutual criticism can be stimulating and it improves the quality of the text.
- Individuals may work faster, because among other things they are prompted by the expectations of their colleagues.
- This is a democratic way of writing the texts
- We can draw upon a wider range of people experienced in the teaching of a subject.

Disadvantages

- The experts may not be easily available or the institution may not be able to afford them.
- Individuals may waste time and/or clash with each other over personal or ideological matters. Individuals may opt out of unpopular tasks within the whole range of activities that constitute the development of a course.
- Individuals may dislike having to abide by majority decisions (e.g., deadlines to complete work).

- Course-team members may dislike the necessity of having to cope with criticisms and suggestions from others on the team.
- Sometimes course-teams work slower than individuals and the costs are therefore higher in such cases.

Check Your Progress 4

In the above discussion, we have touched upon the basic issues involved in writing a text and selecting the part-time course writer. Before going to discuss about the editing the text, let us stop here to complete this exercise. Which do you think better in your context—the course-team approach or the appointing of part-time course writers? Give at least three reasons to support your answer.

- Note:** a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of this unit.

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1.3.3 Editing the text

The editor is a professional who can help writers to improve their texts, also ensuring the consistency of content and preparing the final draft for printing.

Before the course is ready for printing, there is a need for the intervention of an editor who may be involved from the initial stage of planning the course. The editor's roles vary from one institution to another. S/he generally works on three levels during the development of a course; and

- ensures educational effectiveness in terms of learning outcomes,
- helps in deciding on the suitability and the correctness of content, and
- examines the accuracy and adequacy of the language and style.

The editor works through the first two tasks in consultation with course writers. The third task is usually left entirely to the editor. He/she scrutinizes the correctness of the written expression (including spelling and punctuation) and the consistency of the headings (type size, layout, etc.). Obviously, this job is partly educational and partly administrative as much of the editor's work is concerned with the teaching effectiveness of the materials and s/he will therefore need to develop pedagogic skills to present information and help people to learn. In some institutions, the editor is also responsible for getting the course ready and seeing whether the texts are

printed at the right time and in the right way. We shall present more information on editing and the question of language in units 2 of this block. Suffice it to say here that in certain institutions the first task is performed by the *instructional designer* (also called the *format editor*) and the second task by a senior subject expert usually called the *content/subject editor*.

1.3.4 Typing and printing

Here we shall consider the four different ways of getting course materials printed for mass distribution. Each has its own advantages and disadvantages. It is worth knowing something about each of them, even if all of them may not be available to us at present. Through advances in technology, it should be possible to use different methods of production and we can make choices among them, depending on our needs and resources.

Photocopying/Xeroxing

This technique is particularly useful if we have to produce materials for a small number of learners. Photocopiers can reproduce typed as well as hand-written material. One of the advantages in this case is that the machine used for the purpose is quite easy to operate. However, it becomes expensive to make a large number of copies, using this method.

Stencil duplicating

After cutting stencils with the help of a typewriter (lines, graphs etc. can be drawn on stencils), copies are made by a duplicating machine, which may be either manual or electric. The electric duplicating machine is not expensive, and many institutions can afford it now. The quality of copies is better when obtained from an electric machine and the study material can be duplicated quickly. This method is cost effective and good for short print runs.

Offset litho printing

In this case copies are reproduced from a paper, plastic or metal plate onto which the text is transferred photographically. Line drawings, charts and special headings can be incorporated into the text quite easily. The quality of print will be good up to thousands of copies. Most books are produced commercially by offset litho as it is one of the best means of producing a large number of copies at low cost.

Letter press printing

This is the traditional method of printing, where printing is done directly from raised metal letters, each of which is fixed in its place by a skilled technician called the compositor. Thousands of copies can be reproduced without affecting the quality of material thus printed. In this method, graphs, illustrations or lines have to be prepared separately.

Of the four methods of reproduction discussed above, offset litho is the most useful. What would you choose? Why do we prefer a particular method over others? The choice actually depends on the availability of technology, budget allocation and the number of copies required.

Usually, printing is done by an outside agency as it reduces the cost. Printing facilities are now widely available everywhere. But if your institution has a heavy work load and lots of material to be printed on a regular basis, it is worth having your own printing facilities, which will enable you to have a firm control over production and to ensure that the texts will be ready on schedule, or when they required.

In order to manage production, there should be a good liaison between academic units and production staff. The supervisor of the production process has to plan the production schedule according to the requirements of the academics and he/she should be realistic in judging the time required for each stage of production.

We conclude this sub-section by making a passing reference to *desktop publishing* which is the latest as far as the technology of printing and publishing is concerned. It combines the word-processing facility provided by computer technology with laser printing technology to give us the most efficient means of quality printing known today.

1.4 LET US SUM UP

In this unit we have highlighted some of the general aspects of the process of course preparation and its various stages. Course planning, course designing and writing (called course development), and course production are the main stages, which demand a high degree of co-ordination and cooperation among various departments.

At the planning stage we have to think of the requirements for a course, the resources it needs and the constraints in its production. Once the decision to offer a course is taken, we should pay focused attention to course development and then to printing. All this needs the skill, knowledge and sincerity of people who undertake any of the tasks at various stages. These aspects of the process have been discussed under the general heading the *management of course preparation in section 1.3.*

Check Your Progress: Possible Answers

- 1)
 - i) Assessment of needs
 - ii) Defining objectives
 - iii) Analysing resources and constraints
 - iv) Alternative methods and the selection of criteria
 - v) Development and trials
 - vi) Evaluation
- 2)
 - i) Course Planning
 - ii) Course Development
 - iii) Course Production
- 3)

Part-Time Writer	Full-Time Writer
i) Difficult to recruit	Easy to recruit
ii) Employment on temporary basis	Full-time employment on permanent basis
iii) No institutional control over him/her	Under the full control of the institution
iv) Works under heavy pressure; because he/she has to manage writing along with his/her other full time responsibilities.	Works exclusively for DE
v) Difficult to train for distance education system	Easy to give on-the-job training
vi) Cannot make long-term plans	Can make long-term plans
- 4) A course-team approach is better than single course writers because:
 - i) Course-team can produce good quality texts,
 - ii) This is a democratic way of writing texts,
 - iii) This approach can draw upon the wider range of experiences of the experts of different disciplines, and
 - iv) The course materials can be produced on schedule.

UNIT 2 EDITING

Structure

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Editing of Distance Teaching Materials
 - 2.2.1 How does a distance education editor differ from other editors?
 - 2.2.2 Why do the editorial functions differ?
 - 2.2.3 Different roles of editors in different distance teaching organisations
- 2.3 Editorial Functions in the Development of Distance Teaching Materials
 - 2.3.1 Processing the written materials
 - 2.3.2 Revising the text before preparing the manuscript
- 2.4 Language Editing
 - 2.4.1 Simple language in distance teaching materials
 - 2.4.2 Evaluating the difficulty level of language
 - 2.4.3 Copy editing and printing
- 2.5 Problems Faced by Editors of Distance Teaching Materials
- 2.6 Let Us Sum Up

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- differentiate the editing of distance teaching texts from the editing of newspapers, magazines, books, films, etc;
- describe the process of content and format editing during and after writing the course material for distance education; and
- explain what is meant by simple writing and why editing language is important in distance education.

2.1 INTRODUCTION

The term 'editing' involves making written/text material fit for production. It is the process of examining and correcting the written/print materials, so that it is suitable for publication. In distance education, the process of editing is carried out either by a chief editor or course coordinator or course developer or member of a writing team or by someone who is a professional editor. The role of an editor of distance teaching print materials is pivotal, as it covers all stages of course preparation — initiation, development, production and even post-production. The editor in a distance teaching system has to examine the materials and see that they are self-instructional

and learner-oriented. S/he has to work with course writers, educational technologists, media specialists and institutional administrators. S/he is responsible for academic and pedagogical quality of the self-learning material; that is to say the editor has to check the content, structure of the unit/block, the format, and the language.

In this unit the concept of editing is restrictive. It applies only to print-material. There are editors of films and audio and video programmes. They edit a film or a filmstrip or an audio programme. We have discussed editing the audio and video programmes in course-318 of this programme.

The editing of the self-learning material in print has a mosaic pattern. It takes care of three different aspects. They are: content, format and language. We have considered editing of these three aspects in the following sections.

2.2 EDITING OF DISTANCE TEACHING MATERIALS

If you happen to be an editor in a distance education institution, you will soon realise that your job is a complex one. The proverbial servant might find it impossible to serve two masters at once but that is exactly what the distance educator is expected to do. In other words, you will have to play different roles simultaneously in order to ensure that the course is ready in time. At the same time the challenges and surprises that you meet during the processes of course development and production make you perhaps the real master of the situation. We shall explain this apparent paradox in the following paragraphs.

You may understand the complexities of editing in distance education better if you notice the difference between various kinds of editing. You are likely to be familiar to some extent with the job of an editor of a newspaper or a publishing house or a university press. You may have also known something about the editing of films and radio, television programmes. Here we shall focus on editing in distance education and how it differs from the other kinds of editing.

2.2.1 How does a distance education editor differ from other editors?

The newspaper/magazine editors do not 'brief' their reporters, correspondents and writers on what to write and how to write. But they take the liberty — because their profession allows it to them—to cut others' writing to any size and to change it to suit their purpose without consulting the writers or waiting for their permission.

The editor of a reputed publishing house or a university press may reject written material from an author or accept it with some or no changes. Or, after accepting it, he/she may delay its publication for editorial reasons.

The film editor suggests a few cuts here and some additions there when the production of a film is nearly over. In comparison with the film producer, the director and the artists, the editor's job remains relatively unknown.

You should have noticed a common feature in the work of these editors. They usually begin editing only after receiving something that has already been produced by others—whether a newspaper article, or a book or a film. Also, the editors in all these cases operate in a comparatively independent but narrow domain. In other words, there is very little scope for negotiations, compromises and adjustments between the editors and the writers or the producers.

Such a situation would be extremely unhelpful in the editing of course materials for distance education. The process of editing is carried out during the process of course planning, development and production. Frequent negotiations, compromises and adjustments between the editor and the course writers become inevitable. This is the essential difference between editing in distance education and the other kinds of editing we have mentioned above.

2.2.2 Why do the editorial functions differ?

The functions of the editors differ because the aims of the institutions or firms in which they work, differ.

The editor of a newspaper or a popular magazine always has in mind the commercial success of the firm. Naturally, making a news item or a 'story' as sensational and attractive as possible as in keeping with journalistic ethics. This is equally true of the editors of commercial radio and television programme and of publishing houses thriving on the publication of cheap novels.

On the other hand, the editors of serious academic and research publications aim at a comparatively restricted, select and, elite audience. They look for academic excellence and a high quality of research, unmindful of commercial success. They allow, understandably, a wide range of variations in presentation, language and style, though they may be strict about content.

Your position as an editor of distance education course materials is obviously a very different one. You have to think more about the learners' interests than about your own 'editorial freedom' in the usual sense or about the authorial rights. You have to pay considerable attention to make the course materials helpful and useful to the learners. In the process, you have to make compromises and adjustments with the writers.

Activity 1

**Note: How are these editors likely to act in their particular situations?
Write your answer in the space given below:**

- a) A distance education editor receives a text from a famous subject-expert, finds the content satisfactory but the presentation and the language very bad.
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- b) A newspaper editor receives a leading article on a controversial political event from his own foreign correspondent. The article is extremely well written but thoroughly contradictory of what the newspaper has been saying all along.
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- c) A film editor views a film and finds some of the scenes unnecessary to the theme. The producer and the director feel that the scenes should be there in the film.
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- d) Your article on the latest developments in Quantum Physics has been accepted by an established scientific journal. But the editor is not satisfied with some sections of the article.
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I'll present a sample answer to (b). I can think of three possibilities in this case:

- 1) If the editor cares little for the value of the personal experience and investigation of the correspondent but cares only for the name of the correspondent, s/he will publish the article after carefully omitting the controversial portions.
- 2) If the editor is just worried about his/her job, s/he will withhold the article by not publishing it and not informing the writer about it.
- 3) A clever editor will wait for some time till public opinion changes in favour of the writer's views on the particular event and then proceed to publish the article without any alterations. S/he may possibly write a brief introduction before publishing the article.

2.2.3 Different roles of editors in different distance teaching organisations

The degree of your compromises, adjustments, freedom and rights depends on the nature of the course requirements of different distance teaching institutions. Some institutions have editors who play a dominant role at every stage of course development—starting from course planning up to course production and launching of the course—National Extension College of the United Kingdom is an example.

Some other institutions have well established course teams where the editor functions as a coordinator of the various activities that constitute course development and production. The Open Learning Agency, Vancouver, Canada has such editors-cum-coordinators. The Open University of the United Kingdom has only copy editors since the course team does the rest of the job.

There are some institutions which, because of certain peculiar circumstances, expect the editors to do content editing and linguistic corrections, leaving course planning and course development to the academics of the Divisions/Schools concerned. The current practice at Indira Gandhi National Open University falls under this category.

2.3 EDITORIAL FUNCTIONS IN THE DEVELOPMENT OF DISTANCE TEACHING MATERIALS

Whatever be the specific nature of the work of editors in a particular distance teaching institutions, there are certain common editorial functions to be carried out either by the editor alone or with the help of the course team in order to complete the course production satisfactorily. The International Extension College manual for editors of distance teaching materials list the following as the essential aspects of editing:

Preparation of Text

- appointing/hiring writers to write courses,
- preparing the writers to write,
- developing a course outline that will help the writers,
- deciding on the structure of a unit,
- briefing the writers on presenting the subject-matter and introducing student activities,
- providing advice to distance learners,
- judging the reading level of learners,
- editing the language,
- testing the materials before printing,
- deciding on the format (i.e., page size, typeface, etc.),
- copy editing,
- production and printing,
- course maintenance and revision,
- co-ordinating, writing and production.

In addition to these, we can also include the choice of media (i.e., which portions of the course need audio-video programmes), and assignments in the domain of editing.

The scope of this unit does not allow for a detailed discussion of all the aspects of editing we have mentioned above, and some of the problems such as course planning and course design have already been discussed in block 2 of this course. Course maintenance and revision will be discussed in unit 4 of this block. So, we shall be mainly discussing (1) the process of editing during and after writing, (2) different organisational patterns used in editing distance teaching texts, and (3) the essential skills of an editor in distance education systems.

The following diagram summarises the editor's roles and responsibilities in the overall process of course preparation.

EDITOR'S INPUT	STAGES OF COURSE PREPARATION
Identifying authors Training authors Keeping records Contacting authors	Writing stage
Content editing Format editing (structure editing or interaction with educational technologists, editing the standard of presentation, diagrams and illustrations) Language editing	Processing of the material
Copy editing Proof reading	Production
Gathering information to maintain quality Course maintenance Course revision Course withdrawal	Post production
Interaction with electronic media specialist	Others

Fig. 1: An editor's roles and responsibilities during the various stages of course preparation

2.3.1 Processing the written materials

The process is as interesting as your editorial work is challenging. Once the content material is received, you have both the powers and responsibilities to shape it, modify it and set it in the most suitable way to produce distance teaching units and blocks. You have to 'process' it with the help of educational technologists and other instructional designers of your institution. You have to turn the 'raw materials' (the bare contents or the 'text') into 'finished products' (distance teaching units, blocks and courses) and supply them as commodities in packages (booklets, assignments, audio-video cassettes) to the consumers (the distance learners).

But you can begin this shaping and restructuring only after making sure that the content is adequate and its level is appropriate. You should also see whether the writer has followed the guidelines for presentation of the *content* and *structure* of distance teaching materials. You have to make necessary changes from the pedagogic point of view, because the quality of the material is the prime objective. You have to examine the unit/lesson from two major perspectives:

- Content accuracy or content editing
- Structural correctness/format or format editing

Content editing

If the writer of a foundation course has written about a few important points in detail and left out other general aspects of a given subject, then we say the content is inadequate. Similarly, if an undergraduate course is loaded with difficult points which are meant for postgraduates or research students, we may say that the content level is inappropriate. How do you decide these issues?

Ideally you should wait for the comments of the course team at your institute or you can consult the course director, or get the opinions and comments of other subject experts. This means allowing more time and a democratic process in arriving at a consensus. Where this is not feasible you can take a decision on these, assuming full responsibility for whatever choices you make.

If the content is too heavy, try and make it comparatively lighter. If it is too thin, you can add a little more substance and make it reasonably dense. It would be very good, if this pruning and feeding could be done by the writers themselves. But you can't expect that to happen always. When it does not work, you will have to depend on yourself or other academics or the writer regarding the matter.

You will also have to check the material for accuracy, which involves assessing how adequately the objectives have been met, noticing factual

errors and points of disagreement, making suggestions for additions or deletions, and commenting on the educational effectiveness of the content material.

Format editing

After deciding on the adequacy of the content, you as an editor should see whether the writer has followed your guidelines or briefings on the presentation of the content and has *structured* it in such a way as to help the distance learners learn without the presence of a teacher. That is, check the material to see whether the text is self-instructional. You have to satisfy yourself that a unit has a proper introduction, clearly stated aims and objectives in behavioural terms, adequate access devices, a clear, logical presentation and a summary. We have discussed these access devices in unit 04 of block 02 and unit 06 of block 04 of ES-312.

The format editing is done to maintain uniformity among the various units of a block and course. The format used in different courses of a programme may vary. But normally to help the learners quickly grasp the access devices and content the format should be uniform. Format editing is done to maintain the in-house style or the uniformity of units of a programme. In distance education materials the presentation of content has to be structured. The essential or desirable features for the structure are: content list, introduction, objectives, content in logical order, access devices, self-check questions, glossary, model answers, references etc. The job at the format editing stage is to check if all these components are present in the print material.

2.3.2 Revising the text before preparing the manuscript

When you are satisfied with the content and the format of the written text, it is advisable and useful to pass on the material to the course-team or the academics concerned and to ask for their comments, opinions, suggestions and criticism. You should remember that in spite of your careful editing of the material you may have still failed to notice certain shortcomings.

The opinions, criticism, etc., of the course team or the academics may suggest that certain sections need further modifications, or some more points are to be included. You can make the necessary changes with the approval of the writers (if the writers themselves are willing to make the changes, that would be ideal). But you should also see to it that this does not take an unnecessarily long time.

The view of editing taken in this section is very broad indeed. It is not necessary that each institution assigns all these tasks to one and the same person and then calls him/her 'the editor'. In fact the tasks may be distributed among different people who are given different designations.

Check Your Progress-1

1. List at least ten essential aspects of editing.
2. Discuss the various tasks associated with revising the text before the manuscript is prepared.

Note: a) Write your answer in the space given below.
b) Compare your answer with the one given at the end of this unit

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2.4 LANGUAGE EDITING

The question of language in writing and editing distance teaching materials is very significant. It is the language used that makes the self-learning material comprehensible or difficult, interesting or boring. The language used should be simple and clear for effective communication with learners. Language editing is done to vet vocabulary and sentences used in the material. An editor examines the simplicity and comprehensibility of the words used and makes necessary changes so that learners will have easy access to the content.

Simple language, effective communication and readability

A self-instructional lesson or unit should communicate with us effectively and directly, which is possible when the language used is simple and clear

and the style is personalised. Simple language increases the speed of one's reading and a personalised style narrows the distance between the reader and the text or the writer. In other words, the readability of a text depends upon the simplicity of its language.

Readability: Readability is the quality of a text that grips your attention and persuades you to read further and comprehend the text without getting bored or tired.

The flow of language and the clear, logical development of ideas in a text should encourage you to read more. When you get the satisfaction of having understood the idea or the argument of the text right at the beginning, you want to go further, get more information, question the writer's ideas, investigate the truth of the writer's statements, criticise them and arrive at a balanced assessment of your own.

How to read a self-learning text?

A self-learning text should persuade the learner to read it, participate in and interact with it before it makes us think critically about it. To help accelerate this process it is absolutely necessary to write in a language which communicates most directly. This is, in general, true of all good texts and it is imperative in distance teaching, to make communication effective and direct.

But how to produce such a text that can communicate to us directly? How to write in a simple language? What do we mean by a simple language? How simple should it be and simple for whom? How to evaluate the difficulty level of language? — these are some of the questions which inevitably arise when we talk of simple language and readability.

To answer the above questions somewhat satisfactorily, we have discussed a few issues in the following sub-sections.

Check Your Progress-2

1. What do you mean by readability?

Note: a) Write your answer in the space given below.

b) Compare your answer with the one given at the end of this unit.

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2.4.1 Simple language in distance teaching materials

If you are writing for distance teaching, you should keep in mind quite a few points pertaining to language: sentence structure, vocabulary, style, paragraphing, etc. All these key features are presented in the following discussion.

Why simple language

By simple language we mean, language that is straightforward and relatively unambiguous in meaning. It should convey the message without making us rake our brains over the meaning of words and phrases. If your lesson makes me consult the dictionary very often, you are using too many unfamiliar words. If the sentences force me to re-read them very often, their structure must be difficult, twisted and complicated.

When we write for distance learners, we aim at communicating with them effectively. We want to keep up their speed of reading as well as their interest, in order to help them learn, so it is obvious that our language should be simple, plain and clear.

Sentences: Construct your sentences in such a way as to communicate directly. As far as possible, keep your sentences short. Try to write *simple* sentences in place of *complex* sentences. If your sentence is too lengthy—even simple sentences can be very long—break it into two or more small, simple sentences.

Is it necessary that we should *always* write simple sentences? Of course, compound and complex sentences have their own use but often you can manage with *simple* sentences.

At this point, we should remember that there is no hard and fast rule in using a particular sentence structure. Whether we use *simple*, *compound*, or *complex* sentences, we use them for specific purposes - look at the following sentence:

‘If you are afraid of the wolf, don’t go hunting in the forest’.

It is a *complex* sentence. Try to break the sentence into two simple sentences and see the result. You won’t get the force and the punch of the original sentence in other forms of constructions.

Use short sentences and less adjectives: as a general rule we may use short main clauses (i.e. simple sentences) and avoid lengthy subordinate clauses. Look at this sentence:

“When the entire country was devastated by furious floods and murderous famine, when the people of the land, finding no alternative to keep their bodies and souls together started slaughtering the emaciated cattle and hunting for grass, nuts and roots, when the foreign enemy was amassing his

soldiers and arms with a view to inflicting a defeat such as one that would never allow either the ruled or the ruler to recover from the bleeding, mortal wound and the internal foes were at each other's throat to grab the spoils from whatever was left undestroyed by the fury of the natural elements, the frolicking, slothful, irresponsible, cowardly old monarch was employing all the faculties of his lazy brain in inventing ways of keeping himself blissful in the company of young dancing girls of ravishing beauty and the brimming cups of wine kept in vintage for decades and centuries, and the deceitful, selfish, lecherous, treacherous, cruel and gambling friends."

The sentence may appear to be mesmerising. But you may not get the message clearly and directly. You ought to do a stylistic analysis of such a sentence in order to see its weaknesses.

Now let us try to rewrite it in smaller sentences and with fewer adjectives. We may also change some of the words used.

'The whole country was ruined by floods and famine. People were killing the cattle and collecting grass, nuts and roots to survive on. The foreign enemy was preparing to attack the country and bring it under their rule. The internal enemies were trying to plunder the wealth of the country. The old king was keeping company with wine, women and gamblers!'

You may judge for yourself whether this passage gives the message more directly than the earlier sentence or not.

Vocabulary: You should have noticed that some of the high sounding words and adjectives in the above long sentence have been omitted in its rewritten form. Vocabulary is an area where you can stick to some rules. Never go for high sounding, difficult words when you have easily understandable, common words. As far as possible, use short words. Multi-syllabic words often make your writing difficult, the style pompous and the message weak.

Some people have the wrong idea that if you use many difficult words you are more scholarly. They don't realise how such words can obscure the meaning and make communication ineffective. Simple vocabulary and simple grammar make your writing readable and your presentation lucid.

Use Active forms of verbs: Active forms of verbs make the communication effective. According to Plutarch, Julius Caesar said:

"I came' I saw' I conquered".

Now, try to make the active verbs passive (at least the first and the last). Probably you will write: "(Egypt) was seen by me; I came; (it) was conquered" you miss the power and the directness of Caesar's speech.

Preparation of Text

But let us remember that it is not always possible or desirable to hold too fast to any rigid 'rule'. What we said earlier about sentence structure should hold good for the use of verbs too.

Look at this sentence:

"A truck carrying eggs collided with a bus. All eggs were broken".

If you stick to the 'rule' that you should use active verbs, you may write; "A truck...collided with a bus. The bus broke all the eggs". But would you want to write like that?

Paragraphing: Paragraphing is another important feature in writing. Even if your sentences, grammar and vocabulary are simple and very intelligible, lengthy passages may spoil the effect. As far as possible, present your ideas in their gradual, logical development, each idea in one paragraph. If you pack your paragraph with very many ideas, you may be taxing the reader too much. The reader may find it difficult to comprehend and remember your arguments. Paragraphing, in fact, helps you to think more logically and present your ideas clearly.

Style: There is no 'rule' to teach you how to develop a style. You must struggle hard to develop a style of your own. However, you can learn much from the different styles of various writers. Perhaps you may prefer one to the other. Sometimes you may try to imitate the style of your favourite writer, and you may be quite successful at that. Still, you must find your own way of writing which you think will convey your ideas most effectively.

Conversational and friendly style: In distance teaching, a conversational and friendly style has an educational purpose. When you write a lesson, you are actually communicating with your learners. You want to speak to them through your writing. And so you try to write as you speak.

In the classroom your voice and gestures make your communication effective. In distance teaching, your writing should carry your voice to the readers. You may be physically absent, but you can make your readers hear you, see you, and even observe your gestures through your style. But you should know how to write in a conversational style.

Use personal pronouns: When you and I have something to talk about, we talk directly. I may say, for example: "You seem to be right. But I have a few questions to ask you". This will be the mode of our dialogue or conversation. We acknowledge each others presence. This recognition brings us closer and makes our communication direct.

Impersonal style alienates us because we miss the rapport between interlocutors. I write: "The author desires that the reader recall what transpired between them during their chance meeting not so long ago". Do you see any warmth in such a style? The same thing could be said like this

instead, "Could you recall the discussion we had when we met casually some time ago?"

But there is a danger here. As Holmberg warns as, 'conversational style' should not be 'chatty'. Friendliness does not mean an absence of seriousness. A conversational and friendly style *does* narrow the distance between writer and the reader. But also remember, that as a writer your ultimate aim is not to become 'maty' or 'chummy' with the reader but to *teach*, and the reader's main aim is to *learn*.

Humour: Be humorous, if you can but see that your effort to be humorous doesn't backfire.

I remember what happened when one of my teachers gave a demonstration lesson. His aim was to elicit the students' response and he chose a very humorous essay to do so but soon realised that all his fifty students had unchanging grave expressions on their faces. He stopped his demonstration in disgust and sat in a corner, muttering to himself that we were "Humourless dull individuals". When the next teacher read out the first sentence from the same essay there was a burst of laughter from everyone, except from the 'humorous' teacher, who left the class in anger.

So, be humorous at times, if you have a flair for it, but if not, just be plain and say what you want to say. In either case, concentrate on your main job — teaching.

Your style should vary according to the subject: Even a simple writing style can be dull and monotonous if you don't vary it a little. Check at every stage of your writing whether the language is simple and the style lively and suitable to express your ideas. An idea can be expressed in so many ways. Choose the most appropriate and effective one.

The *style* should also match the subject. When you want to describe a solemn or tragic event, you wouldn't try to be humorous, would you? Again when you are explaining a scientific law, or a mathematical formula it is difficult to vary the style, apart from making your points clear in different ways.

Activity 4

List all the features of the 'simple language' we have discussed. See which of the features are present or absent in unit 4 of this block.

Write your answer on a separate sheet.

Some writers can make even the driest and the most difficult subject both interesting and clear, while some can just be clear. Both are successful, so

far as they aim at teaching. However, the first category of writers do a little more than teaching: They command the readers' attention quickly and persuade them to read and learn.

2.4.2 Evaluating the difficulty level of language

Print material, besides audio and video programmes, constitutes a major part of the self-learning material whether in the form of instructions, case studies, articles, technical reports or text books. Of course, other components such as diagrams, maps, charts, figures, tables, practical tasks and exercises are also likely to be an integral part of the printed learning material. It is therefore limiting to consider only the textual components in terms of their difficulty and level of readability.

Psychologists, educationists and language experts have conducted extensive research to evaluate the language level suitable for particular groups of learners. But their findings and recommendations can only help us to a limited extent when we write lessons for distance learners. However, we may keep in mind certain general guidelines to evaluate the level of difficulty of our language. You could, of course, merely trust your own judgement as to the relative difficulty of the learning material, a judgement that may be based upon years of experience.

If you do not have such experience, or want to consider an alternative, you might like to consider two methods of evaluating the level of the language used in self-learning material. They are:

- i) The Fog Index
- ii) The Cloze Test
- iii) The Complexity Quotient

i) Fog Index

Gunning (1968) says that the two things that make a text 'foggy' or difficult to read, is the number of words of three or more syllables and long sentences. The formula that Gunning created, and which is used to calculate a *Fog Index*, is given below:

$$\text{Fog Index} = (\text{Average number of words per sentence} + \text{Percentage of words with three or more syllables}) \times 0.4$$

You could go through this activity, which will help you to calculate the Fog Index of the learning materials.

In Figure 2, you will come across two paragraphs of 100 words each. Read through both paragraphs and decide which of them is more difficult and why, as well as what it is about one of the two paragraphs that makes it more difficult to study?

Paragraph 1

A major problem facing both the writer of distance teaching material and students is workload. In conventional teaching it is possible to continually assess teaching, to finish a session early or return to it the following week. In distance teaching the problem is to assemble a package of material that can be studied by the majority of learners within the allocated time. The lengthy material makes excessive demands on everyone associated with it. The author who writes it, the printers or software specialists who put it into the required format and the editors and graphic designers who put it into the house style.

Paragraph 2

A typical ethical dilemma arises in deciding on whether to deceive participants, even if this will be only temporary. Some researchers react to this dilemma by arguing for an absolute code of ethics, which would prohibit any researcher to use certain practices under any circumstances; others would leave such decisions to the conscience of the individual researcher concerned. These decisions are complex since they ultimately involve a judgement as to the practical value of the research project. In the paragraphs below, the *trade offs* that often occur between ethical and other commitments, in making a particular research decision, are discussed.

Figure 2: Calculating the Fog Index of the textual material
(Courtesy: Fred Lockwood, 1998)

“There are 100 words in each of the two paragraphs in Figure 2. Paragraph 1 and paragraph 2 consists of seven sentences, of four sentences. The average numbers of words per sentence in the two paragraphs are thus 14.3 and 25 respectively.

In the top paragraph there are 11 words of three or more syllables (the percentage is therefore 11), and in the bottom paragraph there are 25 words; so we have a percentage of 25. If the data is inserted in the formula the Fog Indices for the two paragraphs are 10.12 and 20.00 respectively.

$$\text{Fog Index (top paragraph)} = (14.3 + 11) \times 0.4 = 10.12$$

$$\text{Fog Index (bottom paragraph)} = (25.0 + 25) \times 0.4 = 20.00$$

Gunning spent years investigating the readability of textual material in a whole range of academic and technical areas and with a broad range of learners of different ages.

You may find it useful to discover the Fog Index of the material you present to your learners and check what others believe should be the typical index range of appropriately pitched material. However, you do not have to do this mechanically as explained in the above example. Computer software is now available that will assemble different indices and will do this automatically.

Preparation of Text

For example, a facility is available (when using the Grammar tool in Microsoft Word) that will allow you to calculate an index of readability called the *Flesch Reading Ease Score*. This is a widely used index and has been demonstrated to be extremely reliable in predicting the difficulty of prose material. When Flesch Reading Scores were calculated for the two paragraphs in Figure 2 the following indicators were available in seconds:

	First paragraph	Second paragraph
Counts		
Words	100	100
Characters	483	543
Paragraphs	1	1
Sentences	7	4
Averages		
Sentences per paragraph	7	4
Words per sentence	14.29	25.00
Characters per word	4.74	5.35
Readability		
Passive sentences	14.29	00.00
Flesch Reading Ease	52.75	32.56

Figure 3: indicators to find out the difficulty for text material
(Courtesy: Fred Lockwood, 1998)

The indicators confirm that there are 100 words in each paragraph, that the first paragraph has seven sentences and the second paragraph has four and that the average number of words per sentence are 14.29 and 25 respectively. The calculation of the Flesch Reading Ease Score is based on the average number of syllables per word and the average number of words per sentence with scores ranging from 0 to 100. It is suggested that standard writing averages should be between 60 and 70 with a high score indicating the greater number of people who can readily understand the text. In the case of the two paragraphs the scores are 52.75 and 32.56, and the second paragraph is considered significantly more difficult than the first. While you suspect that this is fairly obvious from your reading of the two paragraphs, the computer software would allow you to check whole modules or even courses in this way.

Other software packages are available that will provide similar indices—average sentence length, words not in the programme vocabulary, words used repeatedly, etc. The beauty of such software is that you can make simple modifications to successive drafts (shortening sentence length, substituting more common words, deleting repetitive words and phrases) and immediately see the effect upon the series of indicators. Field trials suggest that such simple modifications significantly reduce the difficulty of the material.” (Lockwood, 1998)

ii. Cloze Test

The Cloze Test is extremely simple. It is based upon samples of the textual material from which a series of words have been omitted, and the missing

words are to be filled in. The introduction from the IET Survey of Reading Skills (Scott and Macdonald-Ross, 1995, page 9) illustrates this readily.

Only one word has _____ left out each time _____ this is indicated by a continuous line. All the lines _____ of equal length, so they _____ no clue as to the _____ of the missing word. Spelling is _____ important, as long as it _____ clear what the word _____ that you intend to _____ in the gap. If at _____ you can't think of a _____ to put in the gap, read on and _____ back to it later. You may also go back and change your choices.

Cloze Tests do vary somewhat but typically delete every fifth or seventh word. The words written in by the subject are compared with a short list of acceptable words. The Cloze Test is not only extremely simple to conduct and score but has demonstrated that it is extremely valid and reliable in predicting the reliability of prose material. It measures what it is designed to measure and does so consistently. It is because of this that colleagues within the OU (Scott and Macdonald-Ross, 1995) administered three short Cloze Tests to approximately 3,000 students as part of their postal survey of OU students' reading skills. The sample included students from all five foundation courses and four levels of educational qualification.

Passage One was drawn from a basic skills training screening test—an indicator of basic functional literacy. Passage Two was typical of OU foundation course material—it could be equated with the editorial one would expect in a broadsheet newspaper. Passage Three was an extract from a book review in the *Times Higher Educational Supplement* and typical of the text one would expect to encounter in an academic study. In interpreting test scoring it is argued that those with a test score of 60 percent or better can satisfactorily comprehend the material. A score between 40 percent and 60 percent indicates partial comprehension, and less than 40 percent indicates inadequate comprehension.

Almost all students achieved a score of 60 percent or more on Passage One; they were virtually all functionally literate. On Passage Two almost one-third scored less than 60 percent, indicating that they demonstrated only partial comprehension. However on Passage Three almost one-third scored less than 40 percent — indicating inadequate comprehension — and two-thirds scored between 40 percent and 60 percent, indicating only partial comprehension. In all about 95 percent of the students had difficulty in comprehending the passage.

For an institution that prides itself on the quality of its teaching, and its ability to pitch the material at the appropriate level, the findings were sobering. The authors remark (Macdonald-Ross and Scott, 1995a):

.... most entering students enrolled for OU foundation courses have reading skills which are not at an appropriate level for working with academic prose, and many are seriously deficient.

Preparation of Text

If the OU, with 25 years' experience of producing self-instructional material, can produce teaching material that one-third of new students finds unintelligible (partial comprehension), perhaps it would be prudent to check the difficulty of your material. (Lockwood, 1998, pg. 146-147)

The Complexity Quotient

Rowntree (1990) suggests a short-cut to judge the difficulty level of your writing. He calls it the Complexity Quotient—it is simply the *average number of long words per sentence*.

To calculate it:

1. X = Count the number of complete sentences you have on a page.
2. Y = Count the number of 'long words' (three or more syllables).
3. Divide X by Y (X/Y).

If your complexity quotient exceeds 3, your prose will be more difficult than that of most novels and, indeed, of most top-selling authors writing for non-specialists. You may like to check this quotient for the kinds of material you know your learners do find readable. (Rowntree, 1990, pages 230-231)

The above measures such as the Fog Index, Cloze Test and Complexity Quotient are rough-and-ready tools. They offer a useful way to check on material that looks difficult.

More than any of these formulas, your practice of writing can help you judge the difficulty level of your language. If you are sensitive to it, you can detect at a glance or instinctively feel where your language is getting out of control. You have to mentally struggle with words and construct the sentences many times before you finally put your sentences down on paper. Clear language reflects clear thinking; it means hard work.

What we have said with regard to the above examples in English, is true of all languages. Writing with clarity in any language is a proof of the writers' firm grasp of the subject. Whatever one's specialisation, if one's language is shaky, then writing for distance learners becomes difficult.

Activity 5

Chose two passages from two different books. Apply Robert Gunning's 'Fog Index' formula. Find out the difficulty levels of the language (i.e., the Fog Index) in both the passages. (You may use a separate sheet).

2.4.3 Copy editing and printing

Copy editing and printing are the most mechanical aspects of course production. These are also the aspects common to the editing of text books and journals. Nevertheless, they are as important in the production of self-

learning materials as are the other kinds of editorial work. Once you are through with checking all the aspects of the content and the structure of the written material, you can start preparing the manuscript for the printer. You should give clear instructions to the typist/software specialist on the following:

- Starting a unit (with a new page)
- Indicating section headings (in capital or bold letters)
- Laying out exercises (whether they should be in a frame, or the space for writing answers to be indicated in lines or dots)
- Identifying special features like objectives, main points, summaries, etc.
- Arranging paragraphs (leaving uniform space between paragraphs)
- Allotting space for activities, exercises, tables, schemes, diagrams and illustrations, and
- Punctuation marks.

In 'copy editing' you check whether the language is clear, all the technical terms are explained, headings of sections and sub-sections are properly indicated, paragraphs are neatly arranged, and your instructions on laying out exercises, tables etc. have been carried out. Make two copies of this script. Give one to the printer and keep the other safely with you.

2.5 PROBLEMS FACED BY EDITORS OF DISTANCE TEACHING MATERIALS

After you have had some years of experience in editing distance teaching materials, you may cope with your work quite well even if your institution is a new one and the demands made on you are very difficult. If you have a trained course team, your job will be free of risk.

Now, think of a situation where the institution is new, its aims are unique, it does not have a course team although it is trying to create one, the editor is not familiar with the editing of distance teaching material, and the course writers are also new to the job. This is actually the case with most countries in the developing world.

But even in such circumstances you have to start somewhere because you are the 'editor'. Since there is a serious shortage of course writers, you decide to contact subject experts who also have some experience in distance teaching. Hoping that you can manage with the help of these academics

(remember, you don't have 'educational technologists' as yet) you also ask some experts to supply the content.

With a fair amount of optimism you go ahead and sign contracts with your writers. Some writers show a lot of enthusiasm and readily agree to write the units for you. Others assure you that they will do the job as best as they can. You send them the briefs you prepared on the basis of the guidelines and the curriculum planned by the *course committee* (the expression *course committee* should not be confused with the expression *course team*. In some places this committee is known as an 'expert committee'). You also set a deadline to receive the written material from the writers.

Hoping that the writers will send their materials in time, and in satisfactory form, you go ahead with your plans to start other courses. You are perhaps even tempted to arrange for a printer so that you can get the course material ready in time and launch the course comfortably according to your schedule, even after the last date for receiving the materials is over, your writers do not send the materials. After repeated reminders, you finally receive the materials with a sigh of relief. But you are in for another shock.

Your briefs have not been strictly followed by many of writers. They have elaborated these points which they thought important. The points you wanted to be emphasised have received shabby treatment. Some writers have not even bothered to look at your brief. Inspired by the title(s) of the unit(s) the authors have turned out something which has little or no relevance to the central theme and the main concepts mentioned in your brief.

You are convinced that such stuff will not serve your purpose, and that written materials are to be rewritten. But there is no time left for this.

Moreover, the materials are in the form of conventional lessons or compositions. Introductions to each unit and block remain to be written aims and objectives are to be stated in behavioural terms, access devices are to be built in, the assignment is to be specified and areas which need audio-video programmes are to be decided upon. Without completing these tasks, the materials in their original form may not help the learners much.

You also find the materials unsatisfactory in many other respects; the content is either inadequate or inappropriate, the presentation is disorderly, ideas are not clear and some points are unnecessarily elaborated while points which need explanation are mentioned in passing or omitted altogether.

Above all, the language is quite confusing, and contains cliches, archaic expressions, deliberately employed difficult words, awkward turns of phrase, clumsy, unmanageable syntax and, finally ungrammatical sentences— all of which spoil the content and test your patience.

You firmly resolve to modify the materials, if possible to rewrite them. Your academic colleagues too feel the same way. But there are other problems.

Your university/institution has already announced the programme(s) hoping that everything can be managed and the course booklets can be got ready as scheduled. However, a host of problems—both academic and administrative—arise and tension builds up in every section of the university/institution.

In addition to these, there are problems faced in the press. The printer tells you that you will have to wait at least for a month to get the first 'dummy'. S/he also informs you that the quality paper you want is not available, and the policy-makers of your institute feel that it is not advisable to change their earlier decision in this matter. Before you resolve this problem at the press, scores of other problems are waiting your attention. Applications start pouring in. The institute makes the selection, sends the admission letters to the selected candidates and also specifies the date by which the course materials will reach them.

But the course materials are not ready, even after the specified date has come and gone. The perturbed candidates anxiously write enquiring letters and make incessant phone calls. The administrative staff is irritated by the repeated queries about the course materials. The academic staff get worried. No one knows who is to blame. But every one wants to get the courses ready somehow.

The rewriting, reshaping and structuring of the units are all to be done by you. In some departments all the editorial work is to be done by the academic staff themselves in which case they are called 'course coordinators' or 'course chairpersons'.

In the editing of the first course in the Diploma in Distance Education for instance, the course coordinator and a member of the faculty had to do the entire job of editing. In addition to that the academics had to do the copy editing. An efficient proof reader could have spared them this tedious job — they could have written a few units during the time they spent on proof reading.

Now it must be clear to you that the editing process remains in a constant state of flux. In such a situation it becomes all the more necessary to train the course writers and the editors of distance teaching materials. During the process, the course writers themselves may become educational technologists, instructional designers and editors. That will be the best thing that you can hope for.

Activity 3

You have joined a new distance teaching institution as an editor. The institution doesn't have a course team. It has a few educational technologists. The institute wants you to develop course materials for the first course (12 lessons or units) for a degree programme in physics. You are given six months to do this. There is only one academic in the department of physics. How will you go about your job? Give a tentative time schedule. (Prepare your schedule on a separate piece of paper). The following model may help you prepare your own.

Suppose the Course Committee were to submit the outline on 1st April, 2000, I would plan my time schedule like this.

	Deadline	(You can use this column)
1 Contacting the writers; signing the agreements, etc. (15 days) (Appoint 3 writers)	15.4.2000	
2 Receiving the written materials from the writers (60 days)	15.6.2000	
3 Getting the experts comments (10 days)	26.6.2000	
4 Revision of the content (15 days)	11.7.2000	
5 Designing the text by 3 educational technologists (30 days)	10.8.2000	
6 Linguistic corrections (15 days)	15.8.2000	
7 Comments from Distance Education Experts (10 days)	25.8.2000	
8 Possible changes in the structure of the text (5 days)	30.8.2000	
9 Typing the manuscript and copy editing (15 days)	14.9.2000	
10 Printing, proof reading and binding (16 days)	30.9.2000	

Why did I plan my schedule this way? Here are some clues.

1. Contacting efficient physics teachers is not difficult. If I make my offer attractive I can get the best without spending too much time on the search. So I give 15 days for signing the agreements, briefing the writers, etc.
2. For writing I allow 2 months because it is the most difficult part of the job. Designing the text is another tedious process and it takes at least a month for one educational technologists to design 4 units (i.e., 1 block)

Give your reasons for planning the schedule the way you did.

Write your answer in the space given below:

1	
	
	
	
2	
	
	
3	
	
	

2.6 LET US SUM UP

The essential difference between editing distance teaching materials and other types of editing is this: whereas the editing of a newspaper, a book, or a film begins at a later stage, the editing process in distance education involves all the stages of course development and production. The editor initiates the process of course development and continues to play an important role in the production, launching and revision of the course. Copy editing which is usually taken for 'the editing' in other situations, is only one part of editing distance teaching materials.

The main problem that course writers in the developing countries face is that of grammar and vocabulary. A conscious effort may help them overcome their difficulties with the English language.

While judging the difficulty level of the language and the subject we should be very cautious. Simplistic notions about the level of language may harm the intellectual growth of learners. The difficulty level varies, depending on the individual's educational and intellectual background. But that is no excuse for writing deliberately in a complicated style. In order to enable the distance learners to learn effectively, it is necessary to make our language simple and clear, and the style conversational and friendly.

Check Your Progress: Possible Answers

1.
 - i) Developing a course outline
 - ii) Deciding on the structure of a unit
 - iii) Briefing the writers on how to present the material
 - iv) Offering advice to distance learners
 - v) Judging the reading level of learners
 - vi) Copy editing
 - vii) Production and printing
 - viii) Testing the materials before printing
 - ix) Deciding the format
 - x) Editing the language.
2. The various issues associated with revising the text are to verify the content and structure; to incorporate the opinions, criticism etc. of the academics.
3. Readability is the quality of a text that grips your attention and persuades you to read attentively and to comprehend the text without getting bored or tired. Readability is essential for comprehension, interaction and assessment.

UNIT 3 COURSE MAINTENANCE AND REVISION

Structure

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Two Corrective Operations
- 3.3 Three Levels of Correction
- 3.4 Preoperation Activities: Collecting Information About the Changes Required
 - 3.4.1 Systematic feedback from course users
 - 3.4.2 Unsystematic collection of information
 - 3.4.3 Keeping the record of information collected
- 3.5 Course Maintenance Operations
 - 3.5.1 Deciding on the corrections to make
 - 3.5.2 Carrying out the corrections
 - 3.5.3 Rewriting part(s) of a course
 - 3.5.4 Minimising course maintenance operations
- 3.6 Revising a Course
 - 3.6.1 How to decide on the need for a revision?
 - 3.6.2 Revision operations: some issues
- 3.7 Let Us Sum Up

3.0 OBJECTIVES

When you have worked through the unit, you should be able to:

- explain the two corrective operations for updating a course;
- explain the three levels of corrections; and
- discuss the need for revision of a course.

3.1 INTRODUCTION

We have discussed the process of course preparation, the difficulties and problems in editing distance teaching materials and the importance of using simple and clear language in units 1 and 2 respectively.

Although distance teaching institutions take care to try and prepare perfect materials, it is not unusual to find that these materials suffer from shortcomings, however insignificant these might be. Thus, revising, reshaping and updating the materials is a legitimate part of the ongoing process of distance teaching. What you consider a good text today may become inadequate or 'outdated' tomorrow. A continuous concern for sustaining the 'usefulness' and the 'usability' (the attribute of being easy to

use) of the course is imperative. This unit discusses what this 'continuous concern' means in practical terms.

3.2 TWO CORRECTIVE OPERATIONS

Distance education courses have a 'life-span', of a number of 'course-terms'. That is to say a distance education course is not discarded after being used for just one group of learners. It is used with successive learner-groups enrolled in the programme year after year.

Over the life-span of a course all the three considerations listed below are subject to change. The learner-group (i.e., the attributes of the group) may be affected by (a) the changing 'values' and requirements of life, (b) the content and its presentation, and (c) new developments/inventions in the relevant fields, or even by changes in the programme of the courses, the examination pattern, etc. The impact of changes in these respects in turn affects the quality of the course in turn, if suitable amendments or revisions are not carried out.

There is a need for 'updating' a course with regard to the changing learner-needs and the new developments in the curriculum as also in course-content and course presentation techniques. To this need we can now add a second one to satisfy our concern for maintaining the quality of a course. The second one is the need to identify the *developmental and production errors* and to correct/amend them. So two corrective operations become necessary to maintain the quality of a course once it is produced:

- i) updating the course in respect of content, presentation and curricular changes, and
- ii) dealing with developmental and production errors.

Both are significant. The former grows extensive operationally as the course grows older. But it is not likely to demand any great attention immediately on launching a course. The latter operation is different from the former in that it demands immediate attention soon after a course is put to use. If due attention is paid during the process of course development and production and in the initial years of course-use, it may grow operationally less extensive with the passage of time. While the former corrective operation is directed by the changes witnessed outside the process of course production, the latter is governed by failures within this process.

3.3 THREE LEVELS OF CORRECTION

The two corrective operations described above can be carried out on two levels, namely

- course maintenance, and
- course revision

At the course maintenance level, the possible activities are:

- dealing with the errors that have escaped notice, or appeared at the time of proof-reading,
- changing a word or phrase or a mark of punctuation here and there;
- re-printing a short section or two if the errors therein are too many to list down or too complex to explain.

The amount of redrafting (and reprinting) of the course material at this level is kept to the minimum—not beyond a few sections containing substantial errors. At the level of course revision we are concerned with almost similar details but a more liberal attitude towards redrafting part(s) of course material is allowed. Parts or whole of units/blocks may be rewritten, if this is deemed necessary.

But if an entire course needs to be rewritten, it is advisable to withdraw it and replace it with a new course. In such cases of replacement, the question of following the two lines of operation, which are applicable in the case of course maintenance and of course revision, does not arise at all. Such cases demand a different approach altogether.

The choice of the level of correction is made primarily on considerations of the 'age' of the course and the quantum of 'change' the course needs. The economy involved in the operations becomes a secondary factor. The figure 1 presents the context of use of each of these levels in relation to the quantum of change required.

Operations to carry out	Degree of change required in the course
Course withdrawal/ replacement	100 A lot
Course-revision	Considerable
Course maintenance	0 Little

Figure 1: Correction-levels for quality maintenance operations in relation to the degree of change that a course may need.

In the first few years of use the quality maintenance operation for a course may be pitched at the level of course maintenance. Later it can be carried out on the level of course revision. The revision operations should not normally be delayed beyond ten years of course use.

3.4 PREOPERATION ACTIVITIES: COLLECTING INFORMATION ABOUT THE CHANGES REQUIRED

In sections 3.2 and 3.3 we have identified two corrective operations and three levels of correction respectively. Now the question is how to identify the specific quality maintenance activities that are required by a course. There are two means which can help in this activity:

- systematic feedback from course-users; and
- unsystematic collection of information

The two means are not mutually exclusive but can complement each other.

The use of either of these procedures can be made considerably easy and effective if the course users in distance education are conscious of their respective roles as distinct from those of course users in a traditional context. The learners in the context of distance education should recognise their role as one that is coordinate with, and not subordinate to, the roles of others in the programme/system to make these procedures successful.

3.4.1 Systematic feedback from course users

Systematic feedback can be obtained from

- the records of learners' scores on assignments
- the learners' assessment of the course materials

The assignment record

A periodic review of learners' scores on assignments can help us identify problems with the assignments. We should ascertain the source of difficulty.

Difficulties emerging from assignments may have the following sources, one or more of them put together.

- The learner-ability assumed while preparing the assignment may be much higher than the actual learner-ability and consequently the standard/level of performance expected may be higher than it can be in reality.
- The objective or the task set for the assignment may not reflect the objective or the learning experience of the unit that precedes it.

- The presentation of the assignment may be defective. As a consequence the learner gets a partially or totally different idea of the task required from what the course-writer intends to give.*

If the difficulty is found to lie in any of these sources then there is something wrong with the assignment and it should be rectified. If none of these is really the source of difficulty and yet the learners have fared badly in dealing with the assignment, then we will have to check the unit that precedes the assignment.

Learners' assessment of the course-materials

The learners' assessment of the course material can help us in the process of improving the material. This assessment can be carried out by presenting an 'assessment questionnaire' with every assignment/unit and getting the learners' responses to it. Such a questionnaire may include:

- a checklist of the learning experiences

Illustration 1

Tick the appropriate box to indicate what you feel about the unit.		
The unit is	stimulating	☐
	boring	☐
	demanding	☐
	informative	☐

* A case of illustration can be given here. A course on writing good test-items—in the context of teaching literature—was followed by the assignment given below:

Find an 'appreciation' question on a poem included in the B.A. question paper of your university and rewrite it stating as precisely as possible the scope of the answer. Suggest a maximum length for the answer.

What the course-writers wanted the learners to do was to modify a chosen defective item so as to make the item convey precisely the task required of the examinees and also the scope and the length of the answer expected of them. But most of the learners just reproduced verbatim the defective item (misled by the word 'rewrite') and misfocused their efforts on giving an unduly long account of the scope of the answer. This misunderstanding could have been avoided if the assignment was reworded as:

Choose an 'appreciation' question on a poem from the BA question papers of your university

Attempt to modify the question so as to make it a better one with adequate instruction on the scope and the length of the answer you expect.

- ii) statements of opinion which the learner is to endorse on a 4 or 5-point scale.

Illustration 2

"The unit presents so much data that it is difficult to keep track of the main argument"					
Agree	☐	☐	☐	☐	Disagree
(Tick the appropriate box to indicate the extent of your agreement/disagreement with the statement.)					

- iii) sometimes each box is given a verbal description as in the following illustration, and the learners are asked to indicate their views by tick-marking the appropriate box.

Illustration 3

The problems that are given in the assignment are:			
☐	☐	☐	☐
too much difficult	slightly difficult	just right	too easy

[Note that in Illustration 1 each box represented different attributes. But in Illustration 3 the boxes represent the different degrees of the same attribute (namely, the 'facility' of the assignment problems)]

Constructing and using such items may seem to be superficially easy. But they involve some dangers. The most serious of these is that an examiner is likely to put his/her ideas into learners' head, because of which they fail to present their spontaneous opinions. The learners are constrained to select from only those responses that are provided. One way to avoid this danger is to allow some form of open-ended response also.

We can include questions similar to those in the following illustration.

Illustration 4

Which part(s) of the unit did you like best?

.....

.....

.....

Which part(s) of the unit should be changed?

.....

.....

.....

What change(s) would make these parts more interesting?

	Part(s)	Change(s) that you desire	Your reason
i)			
ii)			
			
			
			
iii)			
			
			
			

While constructing a questionnaire, you should remember that the points/issues you ask questions about, i.e., the 'test-points' will not be the same in all contexts. They will vary from one course to another and also according to the point within the course (at the end of a section/unit/block) at which your questionnaire is to be completed. The choice test-points and the mode of their presentation should be guided by the kinds of decision you hope to be able to make on obtaining the learners' responses.

The difficulty with such assessment questionnaires is the huge bulk of the information collected that you have to process through. Sometimes institutions are forced to throw these papers away, just for want of time to process them. A computer, where available, may be of help in such circumstances. But even there, one should be able to spare the time and effort to feed the data into the computer. Only relevant and manageable data should be collected to work on systematically.

3.4.2 Unsystematic collection of information

You can collect information on the necessary quality-maintenance activities through several unsystematic methods. These methods will also be useful and they need not be looked down upon simply because the process is unsystematic.

The institution can send a 'course comments' page or a 'difficulty sheet' with every course book and ask the learners to return these with their remarks.

It can invite learners to write about the difficulties or problems they face. It can also ask them to point out the 'errors' that they notice.

Learners may hesitate to write in the beginning. But they ought to be encouraged to communicate. Even an angry letter from a dissatisfied learner or an expression of disappointment from too keen a learner may contain some useful hints as how to maintain/improve course quality. The institution can also get 'errors' pointed out by its own faculty. For instance the third source of difficulty in assignments which we mentioned can be noticed when a majority of learners proceed on the basis of a misunderstanding. Having identified the source of the difficulty they must write to the institute suggesting how it can be removed.

One can collect views from other subject experts on the faculty of similar institutions, prospective learners/employers etc.

The members of the faculty can mingle with students during seminars, summer schools or any other gathering at study centres/regional service centres. They can talk to them freely and elicit their views about the course, and can forward the opinions thus collected to the institution.

What we have suggested here is that there are many possible ways in which the institution can remain informed about the weaknesses of the learning materials which can then be subsequently improved upon. Quite a few of these ways and means may not necessarily be 'systematic'.

3.4.3 Keeping the record of information collected

The above section makes it obvious that the collection of requisite information is not to be effected at one sitting, nor from one single source. Information, when proper efforts are initiated, will keep coming from different sources round the year. Hence it is necessary to develop and maintain a device to keep record of all pieces of relevant information that are obtained from time to time and from different sources.

To meet this purpose the institution should maintain a 'correction file' for each course. The file may be opened as soon as the course is printed. All the information pertaining to the corrections needed and the difficulties

experienced should be placed in this file. Besides, a copy of the course book should be retained with this file exclusively for the purpose of marking errors. We call this a marked copy. The marking should preferably be made in some brightly coloured ink so as to be noticeable. Observations helpful to update the course with regard to the post-publication developments in the area concerned—like additional information made available, changes in the sources linked with the course (such as a new edition of a text book with a different numbering scheme, or a reference book going out of print, or references to radio programmes which are no longer broadcast), etc.—should also be marked in the relevant places in the ‘marked copy’ for corrections. The ‘marked copy’ and the ‘corrections file’ should be kept safe because these are to be the documents which we need for quality maintenance operations.

3.5 COURSE MAINTENANCE OPERATIONS

On the basis of the information collected, if we feel the course is not so bad as to require an immediate withdrawal, we can turn our attention to course-maintenance operations. In the first few years of launching a course it is the maintenance operations rather than revision-operations that an institution should think of practising.

3.5.1 Deciding on the corrections to make

Course maintenance involves a series of activities which are too scrupulously planned. When the error-data are collected (by maintaining ‘corrections file’ and ‘marked copy’ you must decide in respect of each *correction-note* whether it is to be dealt with urgently or whether it can wait. In other words, you should decide whether leaving a correction unattended will seriously affect the understanding of a learner. That is, you should decide as to which errors are serious enough as to warrant immediate remedial treatment and which, if allowed to stay uncorrected, are likely to mislead the learners.

The choice of the *correction-notes* to be used immediately should be made on the basis of the seriousness of the error(s) involved. The amount or the extent of change such errors require and the resources needed to bring about this change, may constitute a secondary consideration.

3.5.2 Carrying out the corrections

When you have identified the errors that need immediate attention, you can prepare an errata sheet which must contain an index column (locating precisely the context of error occurrence), an error column (where a phrase, word or line is given with the error component clearly marked) and a correction column (where you show what the corrected version should look like).

Illustration: An Errata Sheet**ERRATA SHEET**

Code: CD/DI/Oct-94

Page	Section	Line	Please read	In the place of
6	ACTIVITY III	8	Please mark the behaviours, conditions and standards with,—and respectively in—the statements of BO's in Activity II.	Please write,—and in at the behaviours, conditions and standards respectively with the BO's in Activity II
9	MODULES ON FROG I	12	Characteristics of Frog	Characteristics in Frog
11	MEDIA I	5	Transparencies	Transpotencies

The errata sheets must be dated and coded. This will help us when we want to replace an earlier errata sheet with an updated version. It is likely that more errors are discovered on a later date or errors taken to be inconsequential turn out to be *serious* with a particular learner-group.

The shorter the length of an errata the easier its use and the greater its usefulness. Where mistakes are more substantial, we had better rewrite and print a page or a few pages rather than include lengthy lists or passages in an errata sheet.

Activity 1

Suppose your error-data on a particular (ten page long) unit of a course presents 40 errors of which two are factual errors, four are serious proof reading errors and the others are proof reading errors likely to be of relatively little consequence (including errors of display, design, indenting, alignment, etc.)

If you are to prepare an errata sheet, will you include all the 40 errors or just a few chosen ones? On what basis will you decide the inclusion of errors?

Write your answer on a separate sheet.

Comments

There may be errors which you can reasonably expect your learners to identify and rectify themselves or expect to cause no hindrance in getting the message across. You can keep these errors out of your errata sheet. If you include all the errors, they may tend to fill many pages, the serious and significant ones getting mixed up with the less serious/not at-all serious ones.

When an errata list is short, a learner may carry out the correction in the 'text' with ease, before he/she starts studying it.

3.5.3 Rewriting part(s) of a course

Rewriting part(s) of a course or short passage(s) of 4-5 lines may be undertaken, when the part(s) is/are found to suffer from substantial errors.

Rewriting part of a course is admissible for yet another purpose namely that of updating. But it should not be attempted just because you find a part of your courses lightly unsatisfactory. You had better allow it to stay till the course is revised. It is not possible to revise courses simply because there is some scope for improvement.

When you have to update a part of the course-content, you can prepare and issue an 'updating slip' or a 'supplementary booklet' depending on the amount of 'content' you are updating. Issuing these slips, is easier and more pragmatic than revising the course just for the purpose of updating a part. Nevertheless, if the stocks are low, one might prefer to reprint an amended edition.

3.5.4 Minimising course maintenance operations

There may be certain parts of a course which need to be changed periodically. For instance, the course committee directing the preparation/implementation of a course may desire to change assignments with every learner enrolment. In the process of course development, if you design your courses to accommodate such routine change, it will keep the work of course maintenance at a minimum. Perhaps printing assignments separately is preferable in the above case, so that new assignment sheets may be issued with every fresh learner-enrollment without having to amend/revise/replace the assignment sheets if they form a part of the course book.

3.6 REVISING A COURSE

Revision operations are much more elaborate and broadbased than maintenance operations. Consequently, they involve more time, money,

planning and effort. An institution cannot generally afford to spend its resources on revising a course after every other term. The general policy is to check whether a course needs revision after a period of operation of, say, five to seven years. In practice even this frequency is often found to be difficult to stick to because of the pressure of work on institutions. But at any rate, to allow a course to continue unrevised beyond ten years of continuous use is not advisable because, even if the content remains satisfactory, the written material may begin to appear dated.

Course revision is then to be thought of under either or both of the following circumstances:

When the course becomes too old-fashioned to continue in use, the quantum of course maintenance activities becomes too large and relatively more expensive than (or, as expensive as) course revision.

3.6.1 How to decide on the need for a revision?

Any course-revision should be undertaken on a planned basis. As it involves considerable expenditure, it should be initiated only when you are sure that it cannot be postponed any further. A periodic checking of the course may guide you in deciding whether a revision is immediately necessary. The sources that will help you confirm this necessity are:

- The corrections file
- Learners comments on/assessment of the course
- Tutor's comments on/assessment of the course
- Comments of an external authority on the subject
- Consultations with experts
- Opinions of former students on the usefulness of the course
- Views of potential students on their expectations from the course

You should decide whether a revision is necessary by studying these various sources.

It is possible that these sources indicate that the course still holds good and may continue to do so for some more time with, perhaps, some minor modifications, in which case we don't advocate any revisions.

We said that the need for revision should be decided on after studying the different sources listed above. But a more pertinent question is: what should you look for while studying these sources? In other words, what observations will warrant the need for otherwise of an immediate revision of a course? The following considerations should help you in this regard:

- **The age of the course**
If the course has become very old, say, more than a decade old, it should be revised.

- **The degree of its success**

You can allow your course to continue without revision, if positive comments from your learners and tutors outweigh the criticism from other quarters.

- **The period of its operation**

The course must have been in operation long enough to give you a clear picture of what revisions are needed.

- **The stock position**

If the existing stock is large, a revision may mean wasting it.

- **The 'life-expectancy' of the course**

If the course is not to be of use or if it is not expected to be in considerable demand after one or two years, revision may be uneconomical.

- **The student strength**

If the student strength is low, revision may be unduly costly and, perhaps, unadvisable.

- **The finance and workforce available**

Revision is feasible only if finance and workforce are available to meet the minimum requirements.

- **The institutional priority**

Priorities may vary from institution to institution (and also from time to time) and may shift back and forth between revising an old course and introducing a new one.

Activity 2

Suppose you work in a distance education institution. Your institution launched a new course two years ago. Two cycles of enrolment are over and the learners of the third are currently in the course. On checking the performance of the course, you find it has been very unsatisfactory from different points of view. But you also observe that revision will be uneconomical.

Think for a while and decide how you will deal with the course.

Write your answer on a separate sheet.

Comments

The course is considered *very* unsatisfactory. At the same time revision is going to be uneconomical.

Besides, the course is only two years old and a revision after two years of use is not desirable, but allowing an unsatisfactory course to continue in use will affect the image of your institution and may also be harmful to the credibility of the other courses your institution offers.

So you can check whether the course may be made to reach a satisfactory level by subjecting it to some course-maintenance activities. If it can thus be made satisfactory, well and good, but if not, you had better withdraw the course. By doing so you will be avoiding considerable undue expenses, besides protecting the image of your institution.

3.6.2 Revision operations: some issues

When you decide on the revision of a course, you also have to decide on what exactly to revise. Most often the entire course does not need alteration. If you find that the whole course needs substantial change, you had better replace it with a different course rather than revise it. *Revision* should not be confused with *replacement*, since revision is relevant when it is required for a *partial* modification of the materials in use. You need to modify only those parts:

- which are found too difficult for the learner to follow
- which effect bad teaching/learning
- which have become out-of date

So a course *revision* is not to be equated with the *rewriting* of the whole course. Some parts of the course may need to be completely rewritten, while some may need a few amendments and yet others may be retained without any change.

Another important question is: Who is to do the revision? The best person to revise a course is the original writer. For a writer to revise his/her own course would be a good exercise in recognising the subtleties of course development and improving upon the skill of course-writing. Anyway, if it is not possible to get the writer to do this work, you can request one or more of the course tutors and/or the course editor to do it rather than entrusting it with some outsider who is a total stranger to the whole affair. The course tutors and the editor may have a more practical awareness of the weakness of the course.

3.7 LET US SUM UP

This unit has discussed the need for sustained quality maintenance activities to keep distance education courses 'useful' and 'usable'. You are to start collecting data on errors and the inadequacies/failures of the course soon after the course is put to use. You are also to monitor the course in order to decide on the necessary corrections, updating and similar activities. After a course has been in use for a few years, you are to assess it thoroughly and revise it, if you find such revision necessary. If too large a portion of a course needs to be revised and/or its revision is uneconomical it can be withdrawn, and replaced with a new course if this is desired and feasible.

UNIT 4 QUALITY ASSURANCE IN OPEN AND DISTANCE LEARNING MATERIALS

Structure

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Quality Assurance: An Ongoing Concern
 - 4.2.1 What quality means in distance education?
 - 4.2.2 How is quality measured?
- 4.3 Benchmarks for Quality Assurance in Learning Materials
- 4.4 Mechanisms for Quality Assurance
- 4.5 Quality Assurance Practices in Preparing Learning Materials: Case Studies
 - * Dr. BRAOU, India
 - * OUHK, Hongkong
- 4.6 Let Us Sum Up

4.0 OBJECTIVES

After going through this unit, you should be able to:

- describe the elements associated with the quality assurance process;
- explain the concept of quality in the context of distance education;
- identify the various benchmarks of quality assurance in learning material;
- discuss the mechanism of quality assurance; and
- identify the quality assurance practices in different open universities.

4.1 INTRODUCTION

The open and distance education learners require a variety of self-learning materials. These are printed modules supplemented by audio, video, and other technology-based materials. These self-learning materials are delivered to the distance learners in a package provided by the institution. This package may contain a set of printed book, a work book, a video programme, or any combination of these items. Given the resources invested by distance education institutions in the production of learning materials in print and the effort put in by students, one basic issue may draw your immediate attention to whether the printed course materials in use facilitate learning. How can the effectiveness of the printed self-learning material be enhanced to improve student learning? How to measure the quality aspect of print materials? Keeping in view all the above questions,

we have focused in this unit on the quality assurance in the learning materials.

4.2 QUALITY ASSURANCE: AN ONGOING CONCERN

The fields of open and distance education which broke the link between the physical presence of the learner and the teacher, and moved from the 'craftsman' approach to teaching to the division of labour brought about the need for an inspection process and these two issues have generated concern about defining the quality and standards of the educational provision in distance education institutions. Tait (1997) has stated that in the context of quality assurance the industrialised system creates greater transparency in distance teaching university work, with course units which are *published* documents widely available to the public. We have open and distance learning where quality assurance related activities are long established and it is a continuing process.

Quality assurance denotes those practices in distance education which lead to some kind of public, formal guarantee or certification, so quality assurance is typically a matter of judging the outcome of the implementation of course material, a special performance, or testing exercise. In the domain of distance education quality assurance includes the course-approval mechanisms, team work for preparing materials, processes of designing the material and the reviews of the material, which are subject to scrutiny either in the form of student questionnaires, or by the review of external experts. The findings of the formal procedures are usually publicly announced or at least made available to the practitioners. In this way quality assurance is an ongoing process and is public and formal in its nature. In general, quality assurance is defined as the process whereby standards are specified for a product or service and steps are taken to ensure that these standards are met substantially. After learning the concept of 'quality assurance', let us discuss how it is an ongoing process.

Green and Harvey (1993: 178) referred to quality assurance as those mechanisms and procedures designed to reassure the various stakeholders in higher education that institutions accord a high priority to implementing policies designed to maintain and enhance institutional effectiveness. They have also identified the following elements as involved in the quality assurance process. They are:

- Inputs to the teaching and learning process;
- The process itself;
- Outputs (e.g. the number of graduates, standards achieved);
- The individual institution and its (quality) management;
- The discipline and
- The course/programme of study.

The definition of Green and Harvey (1993) and the elements identified by them indicate that quality assurance is an integrative process and that it appears necessary to include a variety of individuals and to consider the multiple interrelated facts of the institution. The above discussion emphasizes that quality assurance is a continuing and ongoing process for maintaining and improving the quality of distance education institutions.

This means that dealing with the subject of quality in distance education, means highlighting the importance of involving all the potential beneficiaries of the process, whether direct (users/learners) or indirect (their workplace, society and institution etc).

Check Your Progress 1

- i) List at least four elements of quality assurance as stated by Green and Harvey (1993).

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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4.2.1 What does quality mean in distance education?

Quality is defined in different ways. One simple meaning of 'quality' is in terms of the customer's satisfaction with a product, or its fitness for its particular purpose. It can usually be construed/interpreted in terms of excellence, consistency, and achievement of specified standards. In this context, we would be discussing the definition of quality being used with regard to the products within a distance education institution which is a *producer* of a large number of self-learning materials and a *service provider*. It is also a producer of programmes/courses related *products* such as units, blocks, books, videos, CD-ROMs etc., which have to adhere to specified quality measures and of a service, i.e., the provision of higher education. This provision covers counselling, tutorials, assessments and degree or diploma/certificate awards, and the distance education system needs to know and to be able to measure the quality of its products and services. In a simple way we can say that quality is not synonymous with *excellence*. It indicates the management of a continuous process aimed at bridging the gap between the *expected effect* (what ought to be learned) and the *actual effect* (what has been learned).

However, the criteria for a quality product and a quality service are distinctly different in their objectives, because service is often intangible and cannot be stored, and is usually consumed at the time of production. A product, (for example, the learning material) is more accessible to measurement criteria, and the adoption of certain measures such as the achievement performance of the learners is relatively easy with regard to it. In this way, the whole institution has to work towards a quality product and everyone should be basically in agreement about the way to achieve quality. The method adopted by distance education institutions is to monitor their courses and services, so that distance learners can receive an excellent package. However, the judgement of the quality of a product may be influenced by external factors that the producer of the material has no control over, for instance the help extended by other agencies to sell the product. In addition, the customers' evaluation is partly determined by the quality of the product on sale, and partly by the number of products consumed.

There is an effect of interaction between the product and the service and this has implications for education where the course material may be of a high quality and conform to the specifications for the examining body, but may be perceived as being of poor quality due to poor presentation by the counsellors and poor performance of the distance learners as 'customers'. So there is an interaction effect between product and service, which is often difficult to identify, and the distance education institution has to monitor the whole experience through a course survey to know the quality of the product and the service. From the above discussion the meaning of quality of learning material can be understood in various ways.

- i) In a superficial sense as a glossy package which does not offer any guarantee of the usefulness of the product.
- ii) The highly engineered approach — the notion of quality is about process — which considers what we did to get to this finished product. It does not offer any guarantee that the resource input would stand up to cost-benefit analysis.
- iii) The third concept of quality is that referred to if you are told that the material is "*fit for its purpose*".

With regard to the term "fitness of purpose", you can say that:

- The learning material will definitely work when put to the test; and
- That it will stand up to a cost-benefit analysis.

The analysis of distance education processes, indicate the use of various methods similar to those applied in industry. These have been drawn from control systems theory and offer a coherent set of strategies for achieving a prefixed objective. In this context, it is possible to identify two types of distance education system:

- i) Open-ring
- ii) Closed-ring

Open-ring systems (fig: 1) are based on evaluation of the correctness of the system's input and the soundness of the system's overall structure. Here the main focus is on the learning material to be studied individually (input) and the logistic support offered by the course provider (system structure).

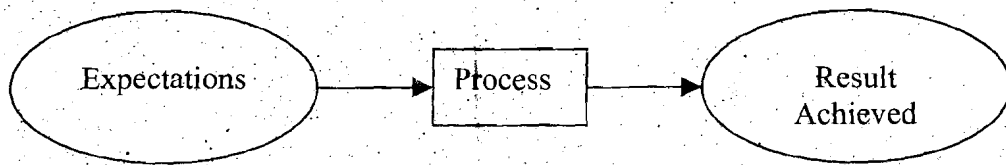


Fig:1 Open-ring system

However, the benchmark for distance education is represented by closed-ring systems (Fig.2).

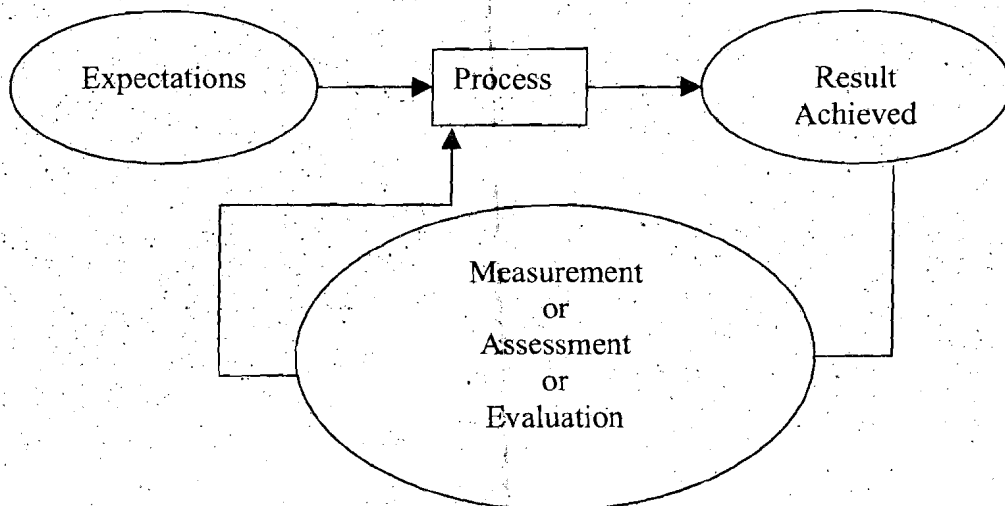


Fig.2: Closed-ring system
(Courtesy: Guglielmo Trentin, 2000 pg. 19)

In the above fig. 1, you may realise that those systems which have the capacity and opportunity for timely self-regulation while in progress, do so due to the reward/effect of the measurement/evaluation of what is expected of the learning process and what is actually obtained.

The key to this sort of systematic realignment is constant *monitoring* (represented in fig. 2 by the measurement/evaluation component) aimed at *formative evaluation* of both the users and the whole process.

From the above discussion, we can infer that quality can be seen to meet and/or exceed the customer's expectations, but different customers place widely varying emphasis on the attributes of a product or service. Within the distance education system the customers could be the students, the counsellors, or the employer of the students, and each of these have different attributes. For example, well prepared learning material may meet the students' expectations whereas for an employer the emphasis may be on skills learned, which are to be utilised at the work place. So each of these will rate the material in different ways.

The product must also attain fitness for the time when students pass their examinations or when they get jobs or it might help them to get a promotion. The quality of the learning material has an enormous effect on the overall quality of a course, so the print material offered to learners should not only deal with topics in a well-structured way but also be interesting and stimulating to use. In addition, the self-learning material provided to learners should contain a guide. This serves to introduce learners to the course, to prepare assignment-responses and also assists in completing the course.

4.2.2 How is quality measured?

Quality assurance measures are seen as quality and security-enhancing measures. Today distance education has developed multi-typologies, according to the specific needs and aspirations of learners. It aims to serve as an alternative mode of educational delivery. It is now evident that points of interrogation on quality assurance addressed to distance education courses are equally applicable to traditional measures of quality assurance, such as quality of curriculum design, instructional materials, assessment, customer's satisfaction with products and services, independent, external and technical reviews, evaluation and validation etc.

- a) Independent evaluation of a course or course survey – We can develop a questionnaire for the use of the focus group. Data can be collected through a postal survey or the focus group students can be invited to complete the questionnaire in the presence of the researcher. The reactions/suggestion of the focus group can provide a greater understanding of how students are perceiving the learning material and how much time they took to complete a course. Their achievement scores also indicate the quality of a course.
- b) Case study of a course — For this purpose, you can design two types of questionnaire. One can be administered at the beginning and the other at the end of the programme. The findings from the case study can provide feedback about the course and the students perception about it. This feedback data can be used to assess the quality of the material.

Check Your Progress 2

Explain the three meanings of 'quality' of self-learning material.

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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4.3 BENCHMARKS OF QUALITY ASSURANCE IN LEARNING MATERIALS

Since the late 1960s a change has occurred in almost all aspects of teaching at a distance. The number of students enrolled in various programmes and courses has increased. The print material designed and produced is now based on the application of new technology. We have today a package using different media, with enough scope for interaction between the learner and the institution, and between the learner and the tutor. In the process certain standards have been established in the international field against which distance education institutions can measure the quality of their own programmes. In this context, Deakin University has contributed to the development of international standards and understanding of quality in the practice and theory of distance education (Deshpande and Mugridge 1994). A few benchmarks of quality assurance in learning materials are:

- A student-centered approach to teaching/learning which encourages learner independence through instructional design techniques embedded in course materials, and interactive teaching strategies. Outcomes can be assessed through student feedback, the responses of employers and the scrutiny of the openly available learning materials.
- Preparation and manufacture of course packages which are open to peer and public scrutiny in relation to their (i) educational effectiveness (ii) intellectual rigour, and (iii) production values. Quality here is ensured not least by the incorporation of instructional design principles into course packages and teaching strategies, and also through the participation of academics and professional educational communications technologists in the design and delivery of courses.
- Commitment to maximising interaction between teacher and learner and among learners, through the use of a range of communications media.
- Implementation of organisational structures, management processes, and financial and administrative systems geared to the different rhythms and imperatives of course development and distance delivery, and the needs of the learners. Quality can be assessed in terms of managerial effectiveness, responsiveness and flexibility and cost-benefit analysis.
- Incorporation of evaluation in all aspects of the distance education programmes/courses/units.
- A willingness to collaborate with other institutions in order to expand access, strengthen individual courses and enhance the quality of programmes of mutual benefit.

In the following paragraphs we have presented a checklist for judging the quality concerns of self-learning print materials.

A checklist for judging the quality concerns in self-learning print materials

It is essential to know what questions to ask to ensure that the print materials will serve the purpose well. While designing new learning materials of your own or adapting packages that are already available, it is important to keep in mind a few points such as the ways in which the materials are intended to function, and how students will react to them. Here we have presented a few questions which can be applied to judge the values of self-learning print materials. These questions can be clustered under major sub-headings as follows:

- Structure and layout
- Access devices
- Objectives or statements of intended learning outcomes
- Introduction
- The content material
- Diagrams, charts, tables, graphs, illustrations etc.
- Self-assessment questions, in-text questions and activities
- Responses to self-assessment questions
- Summaries or reviews

While preparing the print material the course writer/editor may refer to the following questions to know the expected effect (what ought to be learnt by a distance learner).

- *Structure and layout*
 - i) Is the material visually attractive?
 - ii) Does the material include the requisite features of self-instruction, such as self-directed, self-motivating, self-learning, active-learning, individualized tutoring, updated content and self-paced learning?
 - iii) Is there sufficient blank/white space to write notes, answer self-assessment questions posed by the learning materials and do calculations and exercises?
 - iv) Is it easy for learners to find their way backwards and forwards with the help of icons and signposts?
- *Access Devices*
 - i) Is the title clear?
 - ii) Is the concept map appropriate?
 - iii) Is the content easily accessible?
 - iv) Are all the components of self-learning materials embedded in the text?

- *Objectives of statements of intended learning outcomes*
 - i) Are the objectives stated in behavioural and measurable terms?
 - ii) Is there clear indication of any pre-requisite knowledge or skills?
 - iii) Do the objectives presented cover the cognitive, affective and psycho motor domains?
- *Introduction*
 - i) Is each unit/section introduced in an interesting and stimulating way?
 - ii) Are three essential components (thematic, structural and these which function as a study guide) available at the beginning?
- *Diagrams, charts, tables, graphs and illustrations*
 - i) Is each diagram/chart/table/graph self-explanatory?
 - ii) Do the learners know what to do with each illustration?
 - iii) 'A sketch can be more useful than 1000 words'. Is the material sufficiently illustrated?
- *Content material*
 - i) Is it readable, fluent, simple and unambiguous?
 - ii) Is the content relevant and adequate?
 - iii) Is it presented in personalised style using words such as 'I', 'you', 'we' etc.
 - iv) Is the material broken up into manageable chunks?
 - v) Is the material prepared for all types of learners (good/average/below average) and as per the needs of these learners?
 - vi) Will the learners enjoy reading the text?
- *Summary or review*
 - i) Are there clear and useful summaries or reviews?
 - ii) Do the summaries or reviews provide useful ways for students to revise the material quickly and frequently?

Check Your Progress 3

Discuss any two benchmarks of quality assurance of learning material within 30 words.

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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4.4 MECHANISMS FOR QUALITY ASSURANCE

The changing scenario in open and distance education has radically altered the existence, structures, courses and pedagogies of open and distance education institutions. Open campus learning is an approach to education in which the interaction between teacher and learner takes place at a distance. The place, time modes and pace of study are determined as flexible responses to the particular and distinctive situations of the teacher and learner, the subject matter and the learning environment. This opposes the classic definition of distance education as a form in which the teacher and learner are separated in time and/or space, and can only interact through a variety of media.

The open and distance education institutions believe that its continuing commitments to access and equity, learner independence, and professional relevance demand a flexible and interactive approach to curriculum design and modes of teaching. These institutions are now moving towards a stage in which learning is an individual process. Due to this approach, quality assurance has to develop a range of control mechanisms and assurance processes which cater equally to all its media and modes of teaching and learning. These mechanisms are:

- Course design, approval, monitoring and review
- Faculty board
- Curriculum committees
- Academic board
- Course advisory committees on teaching excellence and quality assurance
- Peer review of distance education materials

- Evaluation of staff, students and employees
- Expert opinion on the materials

We have discussed these mechanisms with reference to specific cases in section 4.5 of this unit.

Check Your Progress 4

Discuss the need for quality assurance mechanisms in open and distance education.

Note : a) Space is given below for you to write your answers.
b) Compare your answers with those given at the end of this unit.

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4.5 QUALITY ASSURANCE PRACTICES IN PREPARING LEARNING MATERIALS: CASE STUDIES

In the above discussion, we have explained that quality assurance systems have been practised in various open and distance education institutions. For example, producing learning materials, collecting learners' feedback, analysis of students' assessment, monitoring of assignment-responses and visits to the study centre etc. We have also discussed how the quality assurance system finds ways of monitoring and evaluating the analysis procedures and builds up procedures where users and providers are continuously seeking to improve practice.

This section attempts to demonstrate that social and cultural complexities do influence the organisational structure of education and of the institution's quality assurance mechanism. In this context, we have presented here two

case studies which show up various current issues as well as practices of quality assurance. The first case study is in the Indian context. Koul (1997) the *author* of this case study has examined in detail the operational aspects of Dr. B.R.Ambedkar Open University. Deshpande and Mugridge (1994) debates the factors that contribute to strengths and weaknesses in the process of external revision and describe the development of internal procedures at the OUHK, formerly the Open Learning Institute of Hong Kong (OLIHK).

The case of Higher Distance Education in India – Koul, B.N. (1997)

“At present there are 10 (ten) open universities in India. Out of ten open university one (IGNOU) is a National Open University established by the Central Government under an act of the Parliament in 1985 and the other nine open universities are State Open Universities.

Koul (1997) has mentioned that it is clear from the organisational structures of BRAOU and IGNOU that they have no mechanisms provided explicitly for quality assurance. The tasks involved, however, make it necessary to incorporate various mechanisms which may be labelled quality assurance schemes at the conceptual level and *quality assurance operations* at the implementation level. YCMOU, on the other hand, explicitly provides for *quality assurance* in its management plan. The relevant details of BRAOU quality assurance activities are as follows.

Dr. B. R. Ambedkar Open University

The main function of BRAOU is the preparation and delivery of educational programmes. Accordingly, quality assurance measures are related to the following six processes:

- Planning academic programmes;
- Developing curricula and learning materials;
- Producing learning materials;
- Implementing programmes;
- Reviewing programmes; and
- Developing human resources.

Planning Academic Programmes

New academic programmes are usually identified by the vice-chancellor through informal discussions with, and suggestions or guidelines received from, the state government, the UGC, and other national bodies. The faculty may also initiate proposals. Proposals initiated by either the vice-chancellor or the faculty are placed before the co-ordination committee, which is a non-statutory advisory body made up of senior functionaries such as the deans of the various faculties and directors of the various service units. After the coordinating committee approves the proposal, the faculty or department prepares a detailed proposal for the consideration of the academic senate, the highest statutory academic authority of the university.

which is empowered to approve academic programmes. The detailed proposals approved at this stage are submitted to the executive council, the highest policy-making and administrative authority of the university, for administrative sanction to launch the programmes.

The vice-chancellor, the faculty, the co-ordination committee, the academic senate, and the executive council, all serve as a means of assuring the relevance and quality of the programmes at the planning stage.

Developing Curricula and Learning Materials

After a programme is finally approved, an expert committee made up of internal faculty members and external subject experts is constituted to prepare the curriculum. The committee may meet once or twice for this purpose, and the curriculum thus designed is sent for approval to the academic senate. Thus, it is the subject experts and the academic senate who look into the quality of the programme at this stage.

The approved curriculum and syllabus are passed on to the course team, which consists of subject experts (both from the university and from outside institutions) and an audio-visual producer, who is designated the editor and is responsible for content editing and the quality of presentation. The language of the materials is edited by language experts. The course team also identifies the audio-visual components of the materials, which are developed by the audio-visual centre with the help of the producer and subject experts. Depending on the nature of the course or programme, field practitioners are also associated with the development of learning materials as course writers, editors, or audio-visual programme developers. In a few cases, the print materials are sent to external assessors for their comments, which are subsequently used to improve the materials. The audio-visual materials are previewed by the internal faculty before they are duplicated for use by students.

The quality assurance mechanisms that function at this stage include:

- Editing learning materials for different purposes (content, format, and language);
- Co-ordinating with the producer of audio-visual materials and previewing the audio-visual materials before they are duplicated; and
- Orienting the course writers to make them familiar with the quality requirements.

Producing Learning Materials

The learning materials in manuscript form are then printed by the material production division of the university with the help of private printing agencies. They follow a style manual that the university prepares with the help of printers and internal faculty members. Internal faculty members read the final proofs to ensure error free publications. Similarly, the audio-

visual unit is responsible for producing audio-visual tapes in accordance with an audio-visual manual prepared by the university.

Thus the internal faculty, the audio-visual unit, and the printing division are collectively responsible for the quality of print and audio-visual learning materials at the production stage.

Implementing Programmes

When a course is implemented, the three main processes are: distributing learning materials, providing student support services, and issuing examinations. Learning materials are distributed from the material distribution division at the headquarters, and they are responsible for preparing and adhering to despatch schedules. Student support services are provided by a network of study centres at different locations. The directorate of student services located at the headquarters is responsible for ensuring the quality of these services by determining the norms and patterns of support services required at different study centres. The examination branch of the university is responsible for the reliability and validity of evaluation. The schemes of evaluation and the conduct of examinations are developed by the faculty with the help of external experts wherever necessary, and are approved by the academic senate and the executive council before implementation.

Reviewing Programmes

Learning materials are reviewed on the basis of feedback from learners, counsellors, and subject experts and they are updated by internal faculty members. The university has set up a separate system-evaluation unit, which conducts regular studies on the different aspects of learning materials and implementation processes. The feedback from these studies is used to revise materials and to improve practices.

Developing Human Resources

The university has established a separate unit for staff training and development. This unit undertakes orientation and training programmes for the academic and administrative staff to improve the quality of their services.”

2. Quality Assurance System in Open University of Hong Kong— *Deshpande, P.M. and Mugridge, I (1994).*

Open University of Hong Kong

“The Open Learning Institute (OLI) of Hong Kong presently known as the Open University of Hong Kong (OUHK) is a distance education institution that has embraced the concept of quality assurance and has developed and implemented an integrated quality assurance system. The procedures inherent in this system and the focus of these mechanisms illustrate the

range of methods that may be used, the various individuals involved in the process, and the specific content upon which quality assurance focuses.

Quality assurance at OUHK is pursued through two complementary approaches, external and internal, as well as some specific additional measures.

External Review

The external approach consists of the contribution of advisory peer groups, external assessors, external examiners, and the participation of external peers in the Programme Review and Validation Committee.

Before any degree programme begins at the institute, its aims and the courses that constitute it are discussed by an advisory peer group in conjunction with the academic staff of the institute. The advisory committee is usually made up of nine people drawn from higher education institutions and from professions related to the programme area. The input of the peer advisory committee in assuring the quality of the programme is not limited to the point at which a programme is launched. It goes beyond that and includes advising on programme improvements and reviews.

The institute appoints an expert of high standing as external assessor to review the final draft of any proposed course and to make recommendations to the Academic Board. The assessment involves examining "the course's structure, balance, relevance, content level and pedagogy." (Dhanarajan and Hope, 1992)

The institute appoints external experts from institutions of higher learning as examiners. The external examiners ensure that assessment procedures are fair and that the 'exit standard' of the institute is comparable to that of similar programmes in other institutions.

Besides measures taken to assure the quality of individual courses, the beginning and review of all degree programmes must be approved by the Programme Review and Validation Committee of the institute whose membership includes external peers.

Internal Review

The university's internal approach consists of committees and the roles of tutor, course coordinator and the Education Technology Centre. Internal committees work with external advisory peer groups. Every degree programme has an internal Programme Team that works with its associated advisory peer group. Each course has a Course Review Committee made up of the academics involved in the courses and a representative from the Education Technology Centre.

Preparation of Texts

Each school of the institute has a school committee comprising all the academics in the school. School committees consider proposed courses and programmes. For each course there is an award committee that recommends the award of results to students. At the directorate level, a Course Results group "maintains an overview of the award process on behalf of the Academic Board." (Dhanarajan and Hope, 1992, p. 215)

Besides the use of internal committees, there are other internal mechanisms for assuring quality at OUHK. They are :

- The role of the tutor;
- The role of the course coordinator; and
- The role of the Educational Technology Centre.

Once a student is registered in a course, s/he is assigned to a part-time tutor who is suitably qualified and experienced. "The tutor's role is to deliver both distance and face-to-face teaching to a group of thirty students." (Dhanarajan and Hope, 1992, p. 215) Tutors conduct tutorials and make written comments on students' assignments. Course coordinators are 'high quality' academic staff appointed to oversee the development and delivery of courses. They also monitor the performance of tutors. The Education Technology Centre plays a key role in the training of tutors. The centre provides all new tutors with training material (including a distance learning package).

Additional Measures

There are additional quality assurance measures at OUHK. The university imports its science and technology courses from the UK Open University. The quality of the courses is 'guaranteed in advance' and the courses are adapted, where necessary, to the local environment. Courses that need to be totally relevant to the Hong Kong context are developed 'in-house'.

The university is aware of the importance of its image. The way courses are packaged counts in terms of influencing public perception of quality. Consequently, attempts are made to ensure that the design aspects of packaging create the appropriate image of a high quality institution.

Institutional review is also a quality assurance measure at OUHK. The Open Learning Institute of Hong Kong was established in 1989 and in 1990 it underwent a second institutional review exercise. The 1990 review was conducted by the Hong Kong Council for Academic Accreditation. Based on its findings, the Council "reported that the OUHK had made impressive and substantial progress towards the establishment of a suitable academic environment for the conduct of degree level studies." (Dhanarajan and Hope 1992, p. 218)"

Check Your Progress 5

List the six stages that are related to quality assurance measures at B.R.Ambedkar Open University, India.

Note : a) Space is given below for you to write your answers.
b) Compare your answers with those given at the end of this unit.

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4.6 LET US SUM UP

In section 4.2, we have introduced the concept of quality assurance as the process whereby standards are specified for a product or service and steps are taken to ensure that these standards are met considerably. We have focused on Green and Harvey (1993) who have identified a few components of the quality assurance process which are presented in this section with a note on the concept of 'quality' and how quality is measured.

In section 4.3 we have discussed the benchmarks of quality assurance of learning material.

In section 4.4 the mechanisms of quality assurance have been presented and in section 4.5 we have discussed two case studies indicating the process of quality assurance in open and distance education institutions.

Check Your Progress: Possible Answers

1.
 - i) Inputs to the teaching learning process
 - ii) The process itself
 - iii) Outputs
 - iv) The discipline
2.
 - i) Quality – the product will superficially look 'right' and comes in a glossy package, but does not offer any guarantee
 - ii) Highly engineered approach
 - iii) Fitness for specified purpose.

3. Preparation and manufacture of course packages which are open to peer and public scrutiny in relation to their (i) educational effectiveness (ii) intellectual rigour, and (iii) production values.
 - i) Quality here is ensured not least by the incorporation of instructional design principles into course packages and teaching strategies, and also through the partnership of academics and professional educational communications technologists in the design and delivery of courses.
 - ii) Commitment to maximising interaction between teacher and learner and among learners through the use of a range of electronic media.
4. The open and distance education institutions believe that their continuing commitments to access and equity, learner independence, and professional relevance demand a flexible and interactive approach to curriculum design and modes of teaching. These institutions are moving towards a stage in which the learning is an individual process, so approach to quality assurance is to develop a range of control mechanisms and assurance processes which cater equally to all the modes of teaching and learning
5.
 - planning academic programmes
 - developing curricula and learning materials
 - producing learning materials
 - implementing programmes
 - reviewing programmes and
 - developing human resources.

UNIT 5 APPLICATIONS OF NEW TECHNOLOGIES IN THE PREPARATION OF TEXTS

Structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Advanced Technologies and Pedagogical Perspectives
- 5.3 Developments in the Technology of Preparation of Print Materials
- 5.4 Advanced Technologies and Interactive Writing
 - 5.4.1 What is interactivity?
 - 5.4.2 Why is interaction important?
 - 5.4.3 How do we make materials interactive?
 - 5.4.4 Interactivity and the new media.
- 5.5 The Technology of Writing the Text for New Media
 - 5.5.1 Designing and development of computer-based learning materials
 - 5.5.2 Desktop Publishing
 - 5.5.3 Design and development of a CD-ROM
 - 5.5.4 Design and development of online materials
- 5.6 Let Us Sum Up

5.0 OBJECTIVES

After going through this unit, you should be able to:

- discuss the four models of distance education and the associated delivery technologies;
- describe the importance of interactive technology in distance education;
- explain the three phases of print development; and
- describe the processes involved in writing online learning materials.

5.1 INTRODUCTION

Today distance education is a global social phenomenon. The number of distance education institutions is increasing rapidly in all parts of the world and distance education institutions are part of the education system of almost every country. Due to the absence of face to face interaction between the teacher and learner, the success of a distance education institution depends greatly on the effectiveness of its media system, which plays an important role in disseminating knowledge and experience among its learners.

Self-learning print materials and audio-visual media are the key components of distance education. While such media offer immense potential for

effective learning, they have undoubtedly increased the complexity of the distance educators/course writers/designer's role. The course developers should be aware of contemporary educational theories and research studies which influence the development of distance education materials and some knowledge of the computer is also essential.

We have already discussed, in the first and second blocks of this course, how while designing self learning print materials, you will need to keep in mind certain basic factors, namely:

- i) Factors affecting the effectiveness of teaching and learning processes in open and distance education systems.
- ii) The communication process
- iii) The systems approach
- iv) The media approach and selection of media.

In this unit, we will discuss the application of technology in preparing self-learning materials. Because this is a rapidly changing area, there has been an array of different *terminologies* including various terms such as “*technology*”, *communication* and *information technologies*.

- i) **Technology** is used to refer to the hardware infrastructure which facilitates the development, design and delivery of open and distance learning materials.
- ii) **Communication technology** refers to those networks (carriers) which use telecommunications for both bringing in courseware as well as sending it out.
- iii) **Information technology** is restricted to computer-based systems which are in-house work stations but which can also contain software for training.

We have discussed communicative technology in detail in our course ES-318. In this unit we will mainly focus on the application of new technologies to the preparation of text materials.

There have been major developments in recent years which make the text based material more interactive and distributive. The application of technologies in the context of desk-top publications and computer-text conferencing CD-ROM and internet will be discussed in this unit. As indicated here, the challenge for a course writer is to ensure that the use of technologies is built into the programmes in an effective manner and that such use is appropriate both in terms of the media and the educational objectives.

5.2 ADVANCED TECHNOLOGIES AND PEDAGOGICAL PERSPECTIVES

A review of the development in the application of new technologies in the distance education context could be a useful starting point for analysing the

role of print media in distance education, the effect of other media in the preparation of a text and the emergence of the virtual campus. In recent times print and other media have been supplemented by the advent of new opportunities for interactivity and access to instructional resources provided by the computer communication network popularly known as the 'Internet', the World Wide Web (www) or the Information Super Highway. The models of distance education and associated delivery technologies as suggested by Taylor (1998) in Fig 1 explains how the correspondence model is considered the first generation of distance education, where knowledge was delivered through the medium of print. This is followed by the second generation multimedia model, which entails the use of highly developed and refined teaching-learning resources, including printed study guides, selected readings, videotapes, audio tapes and computer based software, including Computer Managed Learning (CML), Computer Assisted Learning (CAL), Interactive Video. The third generation tele-learning model is based on the use of information technologies, including audio teleconferencing, audio-graphic, communication systems, video conferencing and broadcast television/radio with audio teleconferencing. With the emerging fourth generation of distance education, the flexible learning model combines the benefits of high quality interactive multimedia (IMM), with access to an increasingly extensive range of teaching-learning resources and enhanced interactivity through computer mediated communication (CMC) offered by connection to the internet.

1. First generation The correspondence model • Print	3. Third generation The tele-learning model • Audio teleconferencing • Video teleconferencing • Audio graphic communication • Broadcast TV/Radio & audio teleconferencing
2. Second generation The multi-media model • Print • Audio tape • Video tape • Computer-based learning (CML/CAL) • Interactive video	4. Fourth generation The flexible learning model • Interactive multimedia (IMM) • Internet-based access to www resources Computer mediated communication

Fig.1: Models of distance education and associated delivery technologies.
(Source : Taylor (1998) Indian Journal of Open Learning Vol. 7, No.-1, 1998)

The above figure i.e. models of distance education and associated delivery technologies indicates how teaching in distance education has made use of the different technologies available in the various stages of industrialization.

From the above discussion, you can infer that the more recent technologies are based on the older ones and continue to use them for their own purposes wherever necessary. All four generations have one fundamental thing in common, as far as the learning is concerned. The model of a learning path is being developed for *flexible* and *autonomous* learning that will help learners to be incorporated with one another in the digital learning environment. (Otto Peters 1998).

Check Your Progress-1

- a. List the four models of distance education.
- b. What are the associated delivery technologies for the fourth generation?

Note : a) Space is given below for you to write your answers.
b) Compare your answers with those given at the end of this unit.

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5.3 DEVELOPMENTS IN THE TECHNOLOGY OF PREPARATION OF PRINT MATERIALS

In the above discussion in sections 5.1 and 5.2 we have explained that the present-day course developer supports a mixed model and the new elements that continually emerge in the technology of distance education.

In this section we will focus on the changing perspectives of distance and open learning with the advent of desktop publishing (DTP) and computer mediated conferencing. Both of these are widely used by the open and distance education institutions to design and develop materials. The emergence of new technology in the field of printing and publishing is influenced by computer-mediated conferencing. With the use of CMC the future virtual university will take care of most educational requirements, will be accessible from anywhere and at any time and will be able to satisfy inter-personal communication. CMC is suitable for interactive learning, peer and group learning, the distribution of information and the development and distribution of course materials, to ensure that the system

works efficiently to deliver both quality and a cost effective teaching programme.

Implicit in this discussion is the understanding that a growing number of learning experiences are now available to the distance learners on their desktop via the World Wide Web (www) in a so called virtual learning environment. The www opens up the possibility of global learning events that can be accessed by learners at anytime and in virtually any location as long as they have a connection to the internet. The new technology has made the self-learning materials more *interactive*, making planning, designing and development more important stages in the preparation of self-learning materials. In the following section, we present you phases of the print medium in open and distance education to enable you to realise the importance of the application of technology in the preparation of text material. Here in the following paragraphs we have provided you the first hand experience of *Shannon Timmers* pertaining to three phases of script preparation.

Evolution of the print medium in open and distance education

“Through the late eighteenth and the nineteenth centuries several refinements took place in the basic process of printing. Didot invented duplicate printing plates from set type in 1790. Senfelder of Munich invented lithography in 1796 and, in 1816 Konig and Bauer built the first press capable of printing both sides of a sheet of paper. In 1885, printing reached its mechanical industrial era with the invention of Linotype, a keyboard-operated machine capable of casting an entire line of alpha-numeric type from molten metal. The 20th century technologies exerted a profound influence on printing. It is an entirely new process in which letters and characters in each typeface are stored away on film or recorded. Both positive and negative images are available and typeface can be quickly enlarged or reduced with lenses. When the printing industry began to adopt photo-optic technology in the 1960s, this came as a major change in the print medium. Typesetting is no longer the exclusive domain of print industries.

Computers entered this industry during the 1970s and contributed to printing the power of voluminous information storage and its extremely fast retrieval. Since 1980 there has been intense competition among computer manufacturers to deliver fast and cost-effective page make-up and integrated text processing systems. Over the past 20 years, the contribution and applications of technology in open and distance education mark the transition from the industrial to the post-industrial era, from mechanical to digital technology. The advent of digital typesetting may prove to be as momentous as the invention of movable metal type (Timmers 1990). The recent developments in the technology of print preparation and their application in open and distance education can be discussed under three heads.

Preparation of Texts

- i) Phase I : Mechanical Script Preparation
- ii) Phase II : Partially Integrated Front End
- iii) Phase III: Integrated Electronic Print Development

Some of the world's older open and distance education institutions have seen a complete transformation from mechanical to digital technology in their print development systems, from typewriters to word processors and laser printers. Most of these institutions began by using intermediate technology – typewriters, photo type setting and impact printing. The major introduction of new technology has come about during a second phase. *In this context, here is an excerpt from Shannon Timmers' experience of preparing print material.*"

I. Phase one: Mechanical Script Preparation

"When I (Shannon Timmer) began designing science courses at OLI (Open Learning Institute, Hong Kong) in 1980, course writers usually sent me typewritten manuscripts. These were either edited and retyped on an IBM electric typewriter or sent directly to the production unit heavily marked up with a red pencil, the decision dictated by the perceived tolerance and deciphering ability of staff in production. A key-board specialist then re-keyed the entire manuscript, including lengthy and complex typesetting codes, into a Wang typesetter to produce a good quality, albeit expensive, galley proof. Because codes had to be inserted into the manuscript, the operator was not able to 'see' the manuscript on the video display terminal. As a result, complicated mathematics and scientific manuscripts often had to be re-keyed several times before an accurate final galley emerged. To complete a print-ready manuscript, a paste-up artist amalgamated snippets of galley paper and hand-drawn illustrations provided by a graphic artist. Finally, two-page flats were sent to the print shop for camera work and printing. Our cameras, paper and presses were incapable of maintaining the quality of the galley proofs despite the best efforts of the print shop staff.

There were two major flaws in this system of mechanical script preparation. With each editorial iteration a new manuscript had to be keyed, or one with a lower quality, marked-up script. As well as this, the system produced high quality at final production stage. This type of system and its frustrations are well known to distance education print practitioners (Figure 2).

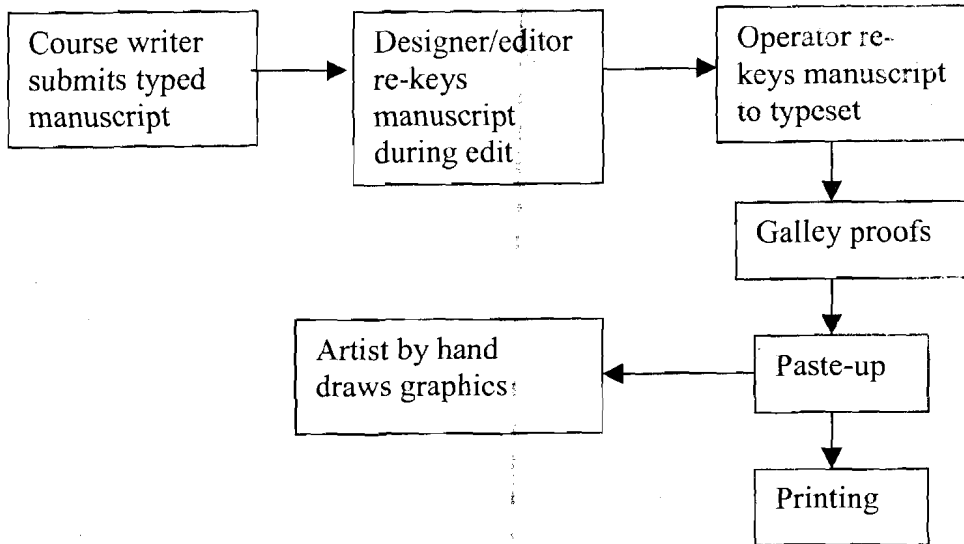


Figure 2: Mechanical script preparation
(Courtesy: Shannon Timmers, 1990)

II. Phase two: Partially integrated front-end

We opted in 1984 to change the print development system at the Open Learning Institute in two fundamental ways. First, each course designer/editor worked on a computer terminal which gave access to powerful word processing software installed on the Institute's central minicomputers and to relatively fast storage and retrieval of manuscripts. Second, a new page make-up system, Xerox's 'Star', was installed. The computer information systems staff of the Institute developed integrative software to permit our central computers to move manuscripts bi-directionally between editors and page make-up technicians in the production unit (Figure 3, Source: Shannon Timmers, 1990).

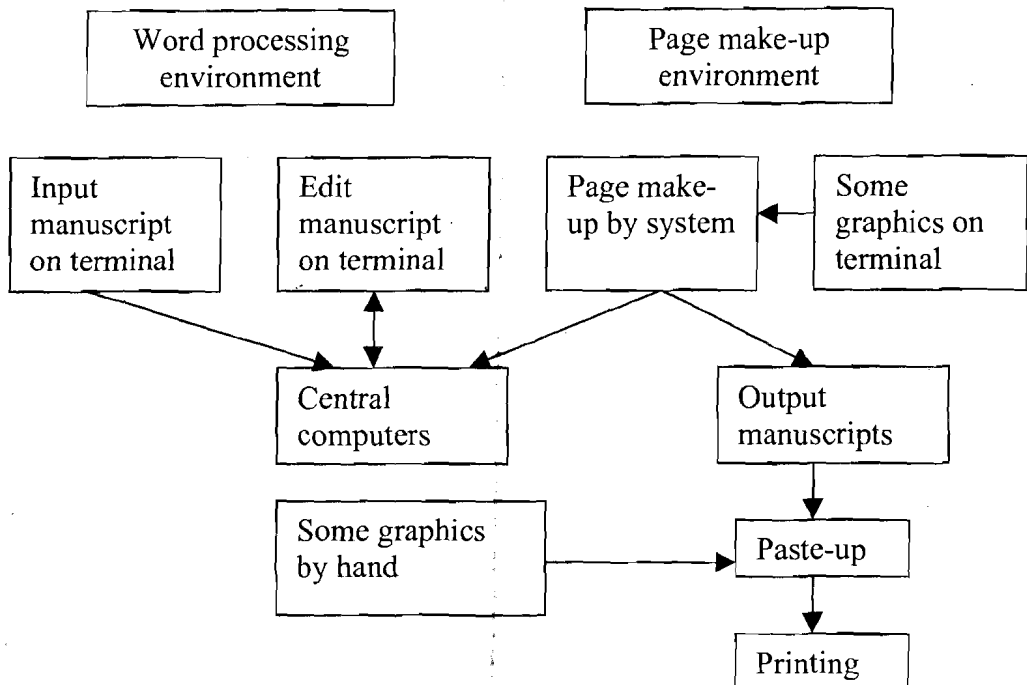


Figure 3: Partially integrated front-end

This new system had an immediate impact on the way manuscripts were treated. Once words are digitally 'captured', in this case by initially keying a manuscript into the system, the manuscript can move electronically through to the printing stage. This is especially possible where all required graphics can be created on a page make-up terminal, a laser printer provides a final page of sufficient quality, and where the production run is of small size. However, in the present OLI print development system, it is common for some of the graphics to be hand-drawn, to use a paste-up specialist to amalgamate mechanical and digital elements of the scripts, and to print large runs on the mechanical printing presses.

III. Phase three: Integrated electronic print development

The partially integrated print development system depicted in Figure 3 not only suggests the way of the future, it also poses significant problems. Its greatest shortcoming is a lack of integration between the word processing environment, represented by the initial input terminal and the designer/editor's terminal, and the page make-up environment (Figure 4). The present debate at OLA centers on the perceived need for common software to serve the domains of course writer, course designer/editor and page make-up artists and technicians, whether or not the process is mediated by a central computer. The value of such commonality is suggested by the experimental, microcomputer-based network between course writer and course designer established at OLI in 1983. This experimental system, also subsequently used to train course writers and developers in Malaysia and Indonesia, was successful in helping writers adhere to form and style guidelines, and in increasing the speed with which courses could be developed.

Common word processing/page make-up environments

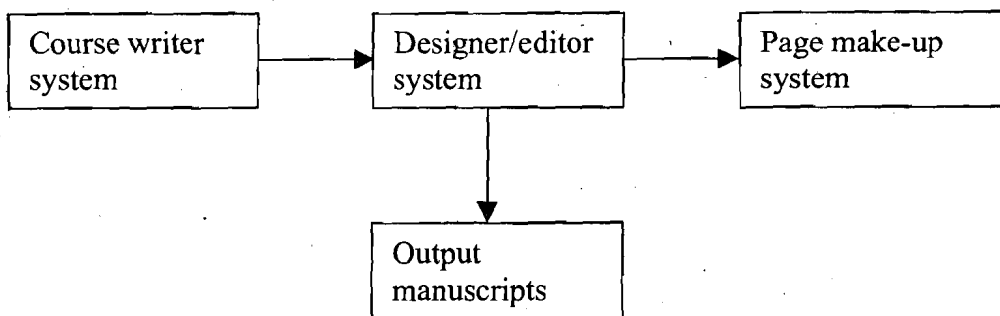


Figure 4: Integrated electronic print development
(Source: Shannon Timmers, 1990)

A well designed system for print development should achieve the following goals: (1) flexible hardware and software made available to front-end workers such as writers, designers and page make-up technicians should allow practitioners in each domain to make maximum contributions to print development while providing necessary controls to prevent divergence from house style, guidelines and other critically important standards; (2) the system must be cost-effective and allow for upgrading; (3) the system

should, if possible, provide interface with adjunct technological devices, for example front-end optical scanners, high resolution graphics terminals, laser printers and communications ports, in order to offer increased flexibility; and (4) the system must ensure that valuable traditional skills such as the graphic arts and layout are offered points of entry."

From the above discussion we can infer that print development is seen and understood as a linear process. New digital technology for print preparation has reduced the burden of choosing a system as it is more portable, more productive and cost-effective. Two situations have emerged which reflect changes in production technology. In the first, a single distance learner registers for a course and the course material is produced on demand and mailed to the learner. In the second, courses are delivered electronically and either read on students' terminals or printed on their home printers. So both options are available today. In the next section, we will discuss the technology of writing for new media which can be read by a student on his/her home printer.

Check Your Progress 2

List the three phases of print development stated by Timmers.

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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5.4 ADVANCE TECHNOLOGIES AND INTERACTIVE WRITING

Interactivity is the property of any *medium* that responds dynamically to user control. We will here discuss the concept of interactivity in association with technology. For example, let us consider an everyday device and examine whether or not it is interactive, and if so, how far. The telephone is a classic interactive device. You punch in a number, it establishes a connection to another telephone corresponding to that number, and the telephone on the other end starts to ring. It responds to user input because it locates and engages another device to which it can *communicate*. So one meaning of interactivity refers to action that must bring about a response to the user's control. This condition is met only when a user on the other end picks up the telephone to open a communication channel and starts

speaking. When the oral communication is initiated, the action becomes dynamic because the user responds dynamically to the communication from the other end and vice-versa. A telephone fits our definition of an *interactive* medium only when communication is actually established.

You could relate this experience to print-based texts as well. You find what you want to read in a text by looking through the table of contents or index or by flipping the pages to look at sections and subsections. You are often guided to a certain page to continue reading. Side bars, bold letters and italics are often present to give additional and important information that is related to the main content. This type of dynamic action- and response based text could certainly instruct readers in how to locate information. Readers, in turn decide whether to follow these instructions, depending on their needs and interests. Text-books have varying degree of interactivity based on the needs and interests of the readers. So books are termed low-tech media.

Advances in computer technology have revolutionized the process of interactivity and we now have high-tech media where the quantity, complexity and speed of information being produced, stored, processed and transmitted has improved a great deal. This development has created a base for the use of interactive technologies in open and distance learning.

After a brief discussion of the role of interactivity in learning materials, let us consider the other aspects of interactivity. Before proceeding to the next subsection, you should work on this activity.

Activity 1

Why you think self-learning print materials should be interactive. Please write a few points on a separate sheet.

5.4.1 What is interactivity?

Interactivity is the provision for the learner to respond in some way to the teaching materials and obtain comments or feedback on this response. Khan and Mc Williams (1998) have stated that interactivity is regarded as especially important in distance learning, where the teacher and students are separated by a distance. So some form of mediating technologies, whether printed material, audio and video cassettes, radio, television, computer or teleconferencing, are essential to minimize problems of communication. Students on distance learning courses generally have limited opportunity for interaction with their tutors or other peer learners, and the learning materials, whether in print or electronic form, have to take on some of this role. Distance learners interact with self-learning materials, simply by reading them, listening to them or watching them, and thinking about what they say.

Distance learning materials also seek to build on other interactive features, for example, activities asking learners to think about something or to do something.

Activity 2

List a few media which require a certain degree of interaction.

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5.4.2 Why is interaction important?

Interactivity is considered an important element in distance learning. In open and distance education the learners and tutor are separated. So mediated technologies such as printed materials, video and audio programmes, computer conferencing etc. should be designed to provide active learning. Moreover, interactive learning involves the learner's response to the learning material, assessment and feedback. Interactivity in print material is important for the following reasons:

- An interactive approach can make up for the lack of other kinds of interaction and reduce the learner's sense of isolation.
- An interactive approach can personalize distance learning materials and bring the writer closer to the learner.
- An interactive approach is likely to stimulate deep rather than surface learning.
- Interaction is essential if print materials are to meet the requirements for a learning dialogue.
- Interaction can encourage active learning and ensure that learners try things out for themselves.
- An interactive approach can help students to process new ideas and link them with their existing experience, thus helping to anchor learning.

5.4.3 How do we make materials interactive?

Here are a few possible ways of making materials interactive. They are:

- Incorporation of a variety of ways of presenting the material.
- Activities that focus a learner's attention on the subject.

- Activities that encourage learners to reflect on their existing knowledge and experience and on how far this may be relevant to the subject.
- Activities that suggest ways in which learners can apply what they are learning.
- Problem solving activities and project work.

5.4.4 Interactivity and the new media

Today, interactive media is enjoying similar recognition as the technology of CD-ROM and online communication take hold in our society. These technologies are no longer novelties—they are useful tools for developing materials. Writers often ask themselves what they need to know in order to write for interactive media: How much material can be put on a CD-ROM? If one has an idea for a web site, is it feasible? How does one write an article for a CD-ROM encyclopedia? The above questions can be answered if we know what is needed to create good interactive media. A certain understanding and basic knowledge of new media technology is needed in writing for interactive media. These interactive media, multimedia or new media, all technology based forms of information and entertainment delivery, require an entirely new approach to writing because they present their content in a non-linear fashion.

As you know, most interactive learning is possible through multimedia, where the writer can mix a variety of visuals and sounds with the text. In some cases, the text is simply the framework for photo graphics, pictures, illustrations, animations, and video, all of which can be used within the text and can be accessed at the user's discretion. In other cases, the entire presentation will be using images and animation with audio while the text itself is a supplement. No matter what the framework within which a text is written, one should keep in mind the nature of interactivity in it. The technology-based forms of information and delivery require an entirely new approach to writing because interactive media present their content in a non-linear fashion. It is still linear writing in which we are traditionally educated, since writing traditional writing still requires a grammar based on a linear logic flow to structure our ideas. Interactive writing skills require that we create an architecture that allows and encourages structural manipulation by the reader. Much of the writing within the structure may possess a linear integrity, but the overall content should be accessible in any order at the command of the reader. The writer should not assume that the reader has some basic foundation information on which successive information is to be based. In other words, the writer cannot assume that the reader will access the information in any particular order. Thus, the interactive writer must work with an entirely new paradigm in which information which would otherwise depend on previous knowledge, can be conveyed in a non-linear way. This requires a new set of tools for the writer of the text. We have discussed about writing the text for different media in section 5.5 of this unit.

Check Your Progress 3

Why is interaction an important element in distance learning? Give at least five reasons.

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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5.5 THE TECHNOLOGY OF WRITING THE TEXT FOR DIFFERENT (ADVANCED) MEDIA

We have already discussed in our previous blocks that whatever the nature of the material being designed it involves six major components.

These are:

- assessment of the needs of distance learners
- defining goals
- identification of specific learning tasks
- structuring instruction
- planning learner interactivity
- implementation

In the following discussion, we will discuss how the above six components are involved in developing computer-based learning materials.

5.5.1 Designing and developing computer-based learning materials

The programmer/course designer has to plan the final product as a whole which is much more than the sum of all the above components. The starting point for all programmes/learning materials is to understand the learner. The products developed and the level of instruction should match the requirements of adult learners. So while assessing the needs of distance learners one has to also consider the academic, cultural, social and economic background of the learners.

Preparation of Texts

Defining goals – It is essential to identify whether the material is targeted towards acquiring knowledge, perfecting a skill, solving a problem or modifying an attitude.

Identifying tasks – It is also necessary to identify the specific learning tasks to be accomplished. For example, editing the language part of a unit is not the same thing as learning to write a unit. To make the task more interesting sometimes additional attributes—visuals, animation or puzzles— may have to be incorporated into the text material.

Structuring instruction – Computer based learning texts/lessons are usually studied alone. It is therefore important to make learning materials and instructions explicit, complete and precise.

Planning learner interactivity – It is important to ensure that the learner has sufficient scope for interaction. Attention must be paid to factors affecting interaction between people and machines. One important concern is that the computer processes information at a rate which may be too fast for the learner. In a classroom situation the teacher/instructor can repeat information as and when the need arises but in computer-assisted learning this need has to be anticipated. Competencies at the linguistic level have to be considered. For example, if a learner is trying to learn how to ride a bicycle by simulation, then he/she is also expected to follow directions/instructions given by the computer. A problem may arise if the learner does not understand the language very well.

Implementation factors such as equipment, role of the instructor are important for the success of computer-based instruction materials. While designing these, the writer should take into account the kind of equipment the learner is likely to have access to, the kind of setting in which the material will be used and whether this setting is on campus or off campus.

Besides these, it is essential for every author or course designer to know that developing computer-based instructional materials requires –

- compatibility with machines
- basic knowledge of instructional design and evaluation
- basic knowledge of authoring systems and tools.

Developing the text for computer-based learning materials

A typeface is a family of graphic characters that usually includes many type sizes and styles. A font is a collection of characters of a single size and style belonging to a particular typeface family. Typical font styles are bold face and italic. Other style attributes, such as underline and outline of characters, may be handled by computer software.

Using text in designing materials

A single item of the menu text accompanied by a single action (a mouse click, keystroke, or finger pressed to the monitor) requires little training and has immediate results.

Imagine designing a project that used no text at all. Its content could not be at all complex, and we would need to use many pictures and symbols to instruct the learner in, how to navigate through the project. Certainly voice and sound could guide the learner, but this would quickly become tiring because greater effort is required to pay attention to spoken words than to browse through a text.

Designing with text

If messages are part of a user-driven, interactive project in which the user works within a real-time framework, you can pack a great deal of text information into the screen before it becomes overwhelmingly busy. Users can travel along your navigational pathways, stopping to scroll through text fields and pausing to study your screen in detail. Here is where you must strike a balance; too little text requires annoyingly frequent page turns and unnecessary user activity; too much text makes the screen overcrowded and unpleasant. Be considerate to the user.

On the other hand, if you are providing public-speaking support, the text will be keyed to a live presentation where it conveys the main message. In this case, use large fonts and fewer words with lots of white space. Let the learner focus on the speaker at the podium, rather than spend time reading fine points and sub-points projected onto a screen.

Computer screens provide a very small workspace for developing complex ideas. At one time or another you will need to deliver high-impact or very concise text messages on the computer screen in as condensed a form as possible. From a design perspective, your choice of font size and the number of headlines you place on a particular screen must be related both to the computerity of your message and to its venue.

Choosing Text Fonts

Choosing the fonts to use in your computer-based learning materials presentation may be somewhat difficult from a design standpoint. Here are a few design suggestions that may help:

- For small type, use the most legible font available. Decorative fonts that cannot be read easily are not useful.
- Use as few different faces as possible in the same work, but vary the weight and the size of your typeface using italic and bold styles where they look good.

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- Vary the size of a font in proportion to the importance of the message you are delivering.
- In large-size headlines, adjust the spacing between letters so that the spacing is appropriate. Big gaps between large letters can make your title appear unclear.
- To make your type stand out or be more legible, explore the effects of different colours and of placing the text on various backgrounds. Try reverse type for a stark, white-on-black message.
- Use anti-aligned text where you want a gentle and blended mode for titles and headlines. This can give a more professional appearance. Anti-aligning blends the colours along the edges of the letters to create a soft transition between the letter and its background.
- If you are using centered type in a text block, keep the number of lines to a minimum.
- Surround headlines with plenty of white space.
- Pick the fonts that seem right to you for getting your message across, then double-check your choice against other opinions.

Fields for Reading

You are already working uphill when you design a text to be read on the screen. Experiments have shown that reading text on a computer screen is slower and more difficult than reading the same text in hardcopy or book form. Indeed, many users, it seems, are more comfortable reading hard copy, and would rather print out their reports and e-mail messages and read them on papers than page through screens of text.

Unless the very purpose of your multimedia project is to display large blocks of text, try to present to the user only a few paragraphs of text per page. Use a font that is easy to read rather than a prettier font that is illegible.

If you are working with a block of text which is too tall to fit on a computer monitor's short page, consider these three possible solutions:

- Put the text into a scrolling field:
- Put the text into a single field in a project window that the user can move up or down upon command. This is most appropriate when you need to present text with page breaks identical to the printed document.
- Break the text into fields that fit on monitor-sized pages, and design control buttons to flip through these pages.

Hyper Text Markup Language (HTML) document preparation

The standard document format used for pages on the World Wide Web is called Hypertext Markup Language (HTML). In an HTML document you can specify type fonts, sizes, colours and other properties common to text documents by "making up" the text in the document with tags. The process of marking up documents is simple. Where you want text to be bold,

surround it with the tags and<IB>; the text between the tags will then be displayed by your World Wide Web browser in bold type.

Let us discuss the components of HTML document preparation.

Symbols and Icons

Symbols are concentrated text in the form of stand-alone graphic constructs, and they are used to convey messages. The windows hourglass cursor tells you to wait while the computer is processing. Though you may think of symbols as belonging strictly to the realm of graphic art, in multimedia you should treat them as text (or visual words) because they carry meaning. Symbols such as the familiar transcan and hourglass are more properly called icons; these are symbolic representations of objects or processes common to the graphical user interfaces of many computer operating systems.

Certainly text is more efficient than images and pictures for delivering a precise message to users. On the other hand, pictures, icons, moving images, and sounds are most easily recalled and remembered by viewers. With multimedia, you have the power to blend both text and icons, (as well as colours, sounds, images and motion video) to enhance the overall impact and value of your message.

Animating text

There are plenty of ways to retain a viewer's attention when displaying text. For example, you can animate bulleted text and have it "fly" on to the screen. You can "grow" a headline one character at a time. For speakers, simply highlighting the important part of text works well as a communicative device. When there are several points to be made you can stack up keyboards and flash them past the viewer in a lined automated sequence. You might fly in some keyboards, dissolve others, rotate or spin others, and so forth, until you have a dynamic bulleted list of words that is interesting to watch.

Sound

Digital sound can be generated synthetically using specialised computer software or it can be obtained by capturing signals from external devices such as audio CDs, video players or microphones. When a digital audio signal is recorded, it may be sampled as mono or stereo at one of several sampling rates (eg 11, 22.5 or 44.4 KHz). Also the resolution of the signal can be set anywhere between 4 byte and 16 byte. In combination, these three factors determine the sound quality and file size. Sound can be stored digitally in a number of standard file formats, the most common of which are AIFF and WAV. Sound compression is difficult due to the higher sensitivity of the human ear to noise and distortion. For this reason, most sound file formats are uncompressed.

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sensitivity of the human ear to noise and distortion. For this reason, most sound file formats are uncompressed.

Alternatively, sound can be stored symbolically in a format such as MIDI (Musical Instrument Digital Interface). In this case, the file does not contain digitally sampled sounds but rather a series of control messages that can be interpreted by sound-producing hardware. Playback of a MIDI file, therefore, requires a compatible device that can reproduce the sound described.

Animation

Animation is a combination of graphics and movie technologies. It is an object actually moving across or onto or out of the screen; common examples are a spinning globe, a car driving along a highway; a bug crawling out from under a stack of disks, with a voice simultaneously sounding from the speakers. Until Quick Time and AVI motion video became more commonplace, animations were the primary source of dynamic action in multimedia presentation. Animation is possible because of a biological phenomenon known as persistence of vision. An object seen by the human eye remains mapped on the eye's retina for a brief time after it is viewed. This makes it possible for a series of images that are changed very slightly and very rapidly, one after the other, to seemingly blend together into a visual illusion of movement. In other words, if you slightly change the location or shape of an object rapidly enough, the eye will perceive the changes as motion.

Images

The image, be it a photograph, painting or drawing is a vital component of every multimedia project. Still images are easier and usually less expensive to use than full-motion video and just as compelling. Most multimedia projects require two classes of still images: those that already exist and those that don't. Existing images need to be found, and those that don't exist need to be created. Text can include headlines, subtitles, pictures captions and blocks of words. Text can be added to the image in a number of ways: over or under it, beside it or wrapped around it. Words can easily be wrapped around silhouetted images. In multimedia, text can be mapped, which means it exists as a graphic unit and is not changeable, or it can be data based, which makes it both searchable and changeable.

Hypermedia and Hypertext

The application of new technology and writing text materials emphasises two overlapping forms, those of *hypertext* and *hypermedia*. Hypertext is a text with illustrations which aid reading and studying. You may start to read wherever you like. For example, if you turn to page 10 in a hypertext to study the characteristics of adult learners, you will find another circular 'need assessment'. Now you can choose to read any one of these text fragments in any order you like. And when reading these fragments, you

node and issue has connecting links across the text. Hypermedia adds video, animation, picture and sound to hypertext.

Multimedia – the combination of text, graphic and audio elements into a single collection or presentation—becomes interactive multimedia when you give the user some control over the information and when it is viewed. Interactive multimedia becomes hypermedia when its designer provides a structure of linked elements through which a user can navigate interactively.

Hypermedia instructional material includes large amounts of text or symbolic content; this content can be indexed and its elements then linked together to afford rapid electronic retrieval of the associated information. When words are keyed or indexed to other words, you have a hypertext system; the text point of this term represents the project's content and meaning, rather than the graphical presentation of the text.

When text lives in a computer instead of on printed pages, the computer's powerful processing capabilities can be applied to make the text more accessible and meaningful. The text can then be called hypertext because the words, sections and thoughts are linked together and the user can navigate through the text in a non-linear fashion, quickly and intuitively.

By using hypertext systems, you can electronically search through all the text of a computer-resident book, locate references to a certain word, and then immediately view the pages where the word was found.

Some authoring systems incorporate a hypertext facility that allows you to identify words in a text field using a bold or coloured style, then link them to other words, pages, or activities, such as playing a sound or video clip related to that word. You cannot do this kind of nonlinear and associative navigation in a sequentially organized book. But on a CD-ROM where you might have more than 100,000 pages of text to investigate, search and browse, hypertext is invaluable.

Because hypertext is an organized cross-linking of words not only to other words but also to associated images, video clips, sounds and other exhibits, it often becomes simply an additional feature within an overall multimedia design. The term "Hyper" has come to imply that user interaction is a critical part of the design, whether for text browsing or for the multimedia project as a whole. When interaction and cross-linking is then added to multimedia, and the navigation system is nonlinear, multimedia becomes hypermedia.

Special programmes for information management and hypertext have been designed to present electronic text, images and other elements in a database fashion. Commercial systems have been used for large and complicated mixtures of text and images. These hypertext databases rely upon proper indexing systems that carefully scan the entire body of text and create very fast cross-referencing indexes that point to the location of specific words,

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fast cross-referencing indexes that point to the location of specific words, documents and images. Indeed, a hypertext index by itself can be as large as 50 to 100 percent of the size of the original document. Indexes are essential for speedy performance.

Commercial hypertext systems were developed historically to retrofit gigantic bodies of information. Licenses for use and distribution of these commercial systems are expensive, and hypertext-based projects typically require the large mass-storage capability of one or many CD-ROMs and/or dedicated gigabyte hard disks.

While *designing materials in hypertext mode* one should consider the following issues:

- What information should appear on the computer screen?
- Where should the learner exercise choice or discretion?
- What options should be available to the learner at these points of decision?
- At what point should a question be asked?
- What form should a test question take?
- Is there any need for review?
- Is there need for audio/video support?
- What supporting material should be on paper?

So while preparing a hypertext, the information is broken up into small units which are linked in a variety of ways. At the same time, the concept of hypermedia is completely learner-oriented, since the information is provided step by step, and the learner, depending upon his/her need decides to consult the item(s) chosen in any order. S/he can very easily move from one topic to the other without having to close or open files. Hyper-media is based on the basic knowledge, capabilities, learning styles and interests of the learner, and is highly receiver-oriented. Here the content matter can be used in the nonlinear format giving the user full freedom to explore information, and to take up any topic of s/he choice.

The strengths and weaknesses of hypermedia are:

Strengths

- Highly motivating
- Allows an in-depth study
- Caters to individual difference
- Is based on student autonomy
- Offers linkages with related ideas/topics
- Allows flexibility of time and space
- Offers rich multisensory learning.

Some weaknesses are:

- Learners can get lost in cyberspace
- The learner is expected to be a computer expert with a fairly high level of computer competency
- Student feedback is not invited
- It is time consuming—the non-linearity along with the richness of information tempts the learner to spend too much time on it.

5.5.2 Desktop Publishing (DTP)

In the present age, it is essential for our course writers to have some idea of Electronic Desktop Publishing (DTP). When printed materials are generated using a personal computer (PC) DTP falls in the category of electronic publishing. The word desktop is used because the required equipment is compact enough to fit on the top of a desk and we call it 'publishing' because the output closely matches the output generated by a publishing press.

Print materials prepared and designed with the help of a DTP can have several additional features such as different lettering size (point size) for headings and sub-heading and parts of text can be made **bold** or *italicised*. It is possible to align text on right, left or both sides. Facilities are also available to help check spellings and to keep a word count.

In DTP, three different types of soft-ware are used for the following purposes:

- i) to write out text,
- ii) to develop graphics, and
- iii) to design pages.

To write out text, word processing software is used. This software allows the text to be edited, formatted or reformatted. With a typewriter every mistakes requires retyping of the entire document, but in DTP we can rectify the mistake by the simple insertion of a word or a line, without changing the entire document. Various software available for *word processing* are *Word Star*, *Word Perfect*, or *Microsoft Word*. Special programmes are available for designing graphics and different types of illustrations. These programmes have a very large variety of shapes and symbols called Clip Art which can be imported directly on the text, and graphics from the clip art can be adapted. To make the text more attractive, pictures and photographs can be added, the photographs being scanned by a special equipment called a scanner and used directly as graphics to be incorporated into the text. For designing pages software for formatting and page layout are available. For example, the *page maker* or *publisher soft-wares*. This software allows you to design pages and to change the typeface and size of the heading, text and column design.

Each page can be designed in to what the publishers call a camera-ready copy (CRC). The strength of DTP is the flexibility it offers for experimenting with different arrangements of image. You can arrange, re-arrange or modify format to achieve the desired results.

5.5.3 Design and development of a CD-ROM

A CD-ROM is viewed as a storage device or delivery mechanism. It enables the learners to engage in purposeful educational activities.

CD-ROM facilitates interaction and exploration. It allows the learners to work at their own pace and at an appropriate depth, but also allows them to examine any misunderstanding or misconceptions.

The CD-ROM format is self-contained and distributed in the same manner as paper books and audio recordings. The standard CD-ROM can contain 650 megabytes of digital information, which can be in the form of text, audio, video and/or computer programmes in any combination. In CD-ROM the storage capacity is large, but finite. In some cases, titles are placed on multiple discs and CD-ROM changers are used to access the contents more easily. CD-ROM design and production has been greatly influenced by a movie and television design sensibility. CD-ROM is more complex than online learning due to the incorporation of multimedia, its design and interactivity. Online tends to use less multimedia approach, while in the use of CD-ROM, the two approaches converge.

Some CD-ROM texts employ a combined approach. They contain online access so that the main content is on the disc but updates can be accessed online. This has been done with CD-ROM encyclopedias and other reference works. This approach works well with material that already exists but must be supplemented or updated on a continuous basis.

CD-ROMs specifically developed for open and distance learners have extended the possibilities for exposition and student interaction with given sources of information. CD-ROM can also be used as an alternative delivery device for distance education; i.e. course materials being combined in digital form and sent to learners on CD-ROM.

Taylor (1995) has described three types of educational multimedia designs for distance learning. They are:

- i) Narrative development
- ii) Interactive development, and
- iii) Resource development

According to Taylor (1995) in *narrative development*, the programme's basic form is that of a tutorial – a topic is introduced and developed, but the storyline is punctuated by structured exercises that require learners to engage with resource materials on the disc. The second type of design, *interactive development* contains no didactic teaching. Instead, the

programme contains resources which enable the learner to undertake interactive exercises involving manipulation and exploration. The third design type, *resource development*, provides learners not only with a rich resource bank of texts, illustrations, audio and video sequences, but also consists of a series of tasks that require those resources to be interrogated and related for any particular purpose.

5.5.4 Design and development of online learning materials

With the advent of the World Wide Web (www) a new and exciting learning environment which is technology-based has been developed. An online learning environment is something that can be created within a World Wide Web environment and accessed via a Local Area Network (LAN). Such a learning environment is a mechanism for distributing information to the learners and performing other tasks related to content, assessment and feedback. The development of online learning materials is no different from the development of print-based learning materials. However, only the production phase includes an *authoring* phase along with the *loading* and testing of your learning materials into the online system.

In an online learning environment the materials development phase will involve the setting up of computers for learner uses, preparing new learning materials, creating quizzes, drawing or scanning pictures, digitising video and developing audio files.

Online writing follows the print paradigm more closely than other forms of interactive media, such as CD-ROM do. Here the writer does not need paper in order to can write, edit and publish. The guidelines for online writing are based on the general rules for interactive writing. According to *Bonime and Pohlman* (1998) while writing for online material you have to:

- i) Write less – because people do not like to read long sections of text on their computer screens.
- ii) Write precisely – because short interrelate chunks can link easily with each other.
- iii) Write with side bars – Side bars are better in online writing than they are in print. In print, sidebars can confuse the reader because they do not flow logically into and out of the main text. In a online text, the user makes the choice, and is able to maintain links with interrelated information.
- iv) Arrange the link properly – any time you reference something that needs elaboration that needs elaboration that might already be available in an online search for it and insert links to the other material.
- v) Use pictures and multi media elements. Pictures and multi-media elements can take a long time to load, but provide a good appearance to the text material.

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- v) Use pictures and multi media elements. Pictures and multi-media elements can take a long time to load, but provide a good appearance to the text material.
- vi) Use tables of contents – In online publishing, you can put your chapters or topics up-front and user can move directly to his/her points of interest.
- vii) Allow searching – Searching provides the best use of the interactive media because it enriches content by allowing instant access to it.

As a course designer, you should also develop required tutorial components such as standard start-up pages, 'structure of element' pages, a consistent set of links and any 'recap' and 'note pages', as well as assessment methodology for your learners.

After designing the material, a course designer can consider a consistent testing and debugging procedure as well as a procedure to review the functionality and ease of operation of the product. It should be piloted with a small representative sample.

From the above discussion, you can infer that the design and development of materials for use in an online environment is no different from the design of a text for distance learning. The major difference lies in the distribution or delivery system. The distance learner is presented with the concepts and information on the computer screen instead of on a paper. An online environment is designed with a minimum number of variables, which is usually done with a combination of graphics and layout conventions along with the division of the content into small chunks. There are also many similarities with the printed text materials, for example both can be accessed directly with little preamble, and both are designed to make the learner independent.

Check Your Progress 4

List at least five strengths of hypermedia.

Note : a) Space is given below for you to write your answers.

b) Compare your answers with those given at the end of this unit.

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5.6 LET US SUM UP

In this unit, we have presented to you a few applications of technology in preparing self-learning materials.

- In section 5.2, we have discussed a review of the development in the application of new technologies in the context of distance education to enable you to know the role of print media and the effect of other media in preparation of text and the emergence of the virtual campus. We have discussed the development of distance education over four generations and how these are associated with preparation of text materials.
- In section 5.3, we have defined 'interactivity' as the property of any medium that responds dynamically to user control and tried to show how 'interactivity' helps to remove the barriers between the distance learner and tutor.
- In section 5.4; there is a discussion pertaining to the development in the technology of preparation of materials. Here we have presented three phases of development in printing technology.
- In section 5.5, we have discussed how to write text materials for DTP, CD-ROM and online programmes.

Check Your Progress: Possible Answers

1. (i) a) The correspondence model
b) The multi-media model
c) The tele-learning model
d) The flexible learning model
(ii) Interactive multimedia, Internet-based access to www resources, computer-mediated communication.
2. i) Mechanical Script Preparation
ii) Partially Integrated Front End
iii) Integrated electronic Print Development
3.
 - An interactive approach can make up for the lack of other kinds of interaction
 - Reduce the learner's sense of isolation.
 - Stimulate deep learning
 - Help to meet the requirements for a learning dialogue
 - Help to link ideas.
4.
 - highly motivating;
 - allows in-depth study;
 - caters to individual differences;
 - based on student autonomy; and
 - allows flexibility.

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