TOPIC 3

Instructional Design

Assessing sample materials

1. Overview

These materials support discussion on the topic of instructional design and the principles of effective teaching, whether that teaching happens face-to-face or at a distance. The principles of good teaching and effective instructional design are first identified; then the roles of the instructional designer are addressed. Instructional design is discussed in relation to target audiences, and the importance of interactivity is emphasised. Finally, the process of developing effective learning materials is presented.

1.1 Source materials for this topic

Morgan, A. *Improving your students' learning*. London: Kogan Page, 1993.

Parer, M. *Development, design, and distance education*. Churchill, Australia: Centre for Distance Learning, Monash University, 1989.

Parer, M. *Developing open courses*. Churchill, Australia: Centre for Distance Learning, Monash University, 1993.

Rowntree, D. *Preparing materials for open, distance, and flexible learning*. London: Kogan Page, 1994.

2. Introduction to instructional design

2.1 What is instructional design?

Instructional design is a systematic approach to facilitating learning by

- identifying the purposes of the learning, especially learning objectives;
- developing the learning experiences necessary to achieve those purposes;
- evaluating the effectiveness of those learning experiences in achieving the purposes; and
- improving the learning experiences, in the light of evaluation, so as to better achieve the purposes.

2.2 Why use instructional design?

One way of explaining why instructional design is of particular importance in open and distance learning is to describe some of the differences between learning in conventional face-to-face settings and learning at a distance.

In conventional face-to-face settings

Teachers have the ability to

- decide which methods and media to use; and
- vary the methods and strategies depending upon the learners' needs.

In open and distance learning

Thorough preplanning is essential because

- 'how to teach' becomes crucial to the success of the entire system;
- learning materials are prepared in advance;
- media to support those materials are pre-selected; and
- changes to materials cannot be conveniently incorporated mid-session.

Instructional design is precisely the necessary preplanning activity.

> *Discussion*: This is an opportune moment for an initial discussion of the differences between learning primarily face-to-face and learning primarily at a distance.

3. Principles of instructional design

Sound instructional design is simply good teaching practice. Good teachers tend to follow similar guidelines. Do your participants agree with the following list?

3.1 Preliminary considerations

Before they begin a lesson, good teachers consider:

- the likely abilities of their learners;
- their learners' level of education;
- their present level of knowledge;
- their social and cultural background; and
- their motivation and interest.

3.2 Defining tasks

On that basis good teachers then define:

- their learners' ultimate overall task;
- the major components of this task;
- the conditions under which each component task will be performed; and
- the level of performance that is desired for each task.

3.3 Task analysis

Good teachers then analyse each component task:

- deleting those tasks that learners can perform already;
- selecting the most important and critical tasks; and
- stating what learners will be able to do as a result of the lesson.

3.4 Structuring the lesson

For a lesson to be effective, the teacher should:

- share the objectives of the lesson with the learners; and
- teach in logical order, using a lesson outline like the following:

Sample Lesson Outline

A. Introduction
   1. issue materials
   2. review previous learning
   3. provide motivation, making this
      a. brief
      b. to the point
      c. stimulating (for example, posing a question)

B. Main body of lesson
   1. provide information
   2. use small steps
   3. break frequently for questions and comments
   4. use teaching aids
      a. to illustrate
      b. to simplify
      c. to provide variation
      d. to provide opportunities for practice and feedback
      e. to summarise
      f. to provide opportunities for future reference
   5. make contingency plans for
      a. what to do with any extra time
      b. which items are essential if time becomes short

C. Conclusion
   1. deal with difficult points
   2. summarise
   3. mention the content and relevance of next lesson
   4. test
      a. in class
         i. put questions to class as whole
         ii. be clear and precise
         iii. require a brief answer
         iv. be encouraging
         v. avoid embarrassing learners
      b. after class, evaluate whether
         i. you ought to change anything about the way you taught the lesson
         ii. you achieved what you set out to achieve

3.5 During the lesson

While teaching, effective teachers

- communicate clearly;
- are well-organised;
- link past and present learning;
- encourage learners to participate;
- provide practice and opportunities for practice;
- avoid monotony;
- use emphasis;
- demonstrate their own interest;
- use teaching aids effectively;
- repeat important points;
- ask questions; and
- remain flexible.

> *Discussion*: Do your participants agree with this list? At what points do these guidelines differ when they are applied to open and distance learning?

4. Models of instructional design

In describing some models of instructional design, we begin by describing some of the tasks performed and roles played by the instructional designer.

4.1 What do instructional designers do?

The instructional designer works in collaboration with the subject specialist to design materials that facilitate learning of the subject matter. (This material is based on Noel Jackling's article, 'Weaving my own design', in M. Parer (ed.), *Development, design, and distance education* (1989).)

4.2 Roles of the instructional designer

An instructional designer is advised to approach the subject specialist in the following ways:

- regard the subject specialist an expert in the subject matter;
- listen to what the subject specialist has to say;
- provide feedback to the subject specialist (for example, 'If I were a student my response would be...');
- seek clarification;

- encourage new ideas (for example, 'Have you considered...?');
- ask the subject specialist, 'What are your desired outcomes?';
- draw out the traditional teaching wisdom from a specific discipline and respect it; and
- keep as a paramount concern what is best for the learner.

Approaches an instructional designer is not advised to take with the subject specialist:

- outside consultant;
- process expert;
- paternalist (spoon-feeding the subject specialist)
- colonialist (encouraging the subject specialist but never giving her independence);
- proselytiser (preaching values to the subject specialist);
- instructor (regarding the subject specialist as a pupil);
- remedier of subject specialist defects;
- prescriber of learning methods for particular subject areas; and
- client-centred counsellor.

4.3 Tasks of the instructional designer

The instructional designer works as a 'surrogate learner', asking the subject matter expert the kinds of questions a student would ask, for example:

- Do I understand or am I confused?
- Is there an ambiguity?
- Is there a clear learning path?
- Where have I come from?
- Where might I be going to?
- Am I being transformed from naïve learner to expert?
- Would an example help me understand?
- Would an exercise help me learn by doing?
- Do I consider that the writer is writing for me personally, or is the writer being impersonal and needlessly 'academic'?
- Am I put off the whole subject by the difficulty of the first item of assessment?
- Am I put off by the style of writing or by the use of uncommon words or unduly long sentences? Can what is being said be said more simply?
- Am I getting cues as to what the really important parts are?
- Is the structure apparent? Have advance organisers been signposted?

4.4 Constructivist approaches to instructional design

Most textbooks on instructional design deal with 'objectivist' approaches to instructional design, which are concerned primarily with the transmission of knowledge and with facilitating the process of the learning of that knowledge.

In contrast, constructivist approaches to instructional design put the learners and the knowledge they bring to the learning situation at the centre of the instructional design enterprise. These approaches are based on the following principles:

- Learners are a legitimate source of knowledge. Learners are encouraged to learn to trust themselves and their knowledge.
- Learning is not a passive exercise of absorbing knowledge (information) developed and transmitted by 'experts'. Learners are encouraged to take control of and initiate their own learning.
- Ambiguity and contradiction are not problematic. They can be helpful in pushing us toward a problem-solving, or problem-posing, approach to learning.
- Systematic reflection is an essential activity if personal experience is to facilitate a deeper understanding. Keeping a diary is a typical course activity.

In designing materials using this approach, the designer's role is that of collaborator not just with the subject specialist but with the learner as well. In using constructivist approaches, instructional designers also need to be aware of the media which lend themselves more readily to this approach, such as computer conferencing and other forms of computer-mediated communication.

5. Needs assessment of target audiences

What do you need to know about your learners in order to design effective learning materials for them?

Discussion: Take advantage of the wealth of examples that are available from your and your participants' experience. In addition, examples of different learner audiences and institutional responses are available in the case studies that are provided with this kit.

Needs Assessment of Target Audiences

Demographic factors	How many learners are you likely to have?
	What age or age range? Are they children or adults?
	Are they men or women?
	What is their family status?
	How many children do they have?
	What is their geographic location (rural or urban)?

	What is their previous education? What language or languages do they read and speak? Do they hold jobs?
Motivation	Why are they learning? How might your programme relate to their lives or work? What do they want from the programme? What are their hopes and fears?
Learning factors	What are their beliefs about learning? What learning styles do they prefer? What learning skills do they have (for example, what reading ability)? What experience do they have of open and distance learning?
Subject background	How do they feel about the subject of the programme? What knowledge and skills do they already have in that subject? What misconceptions or inappropriate habits do they have? What personal interests and experience might they have that are relevant?
Resource factors	Where, when, and how will they be learning? Who will be paying their fees and expenses? How much time will they have available for study? What access will they have to facilities such as study centres? What access will they have to the equipment and media required for the course? What access will they have to support from tutors, mentors, colleagues, and other learners?
Typical problems of open and distance learners	What are their family pressures? Do they face worries about work and money? Are books and libraries lacking? Do learners lack their own study space?

	Are they isolated from other learners? Do they lack transport to get to tutorials? Do they lack confidence? Have they no undisturbed study time? Is their reading ability at a low level? Are they too busy to attend tutorials?

Discussion: Divide participants into pairs or small groups and assign them the task of describing the learner population for whom they are designing learning materials, using the characteristics listed above.

6. Interactivity, feedback and assessment

6.1 What is interactivity?

Interactivity is an essential aspect of open and distance learning materials, for the following reasons:

- Learners in distance learning courses generally have limited opportunity for interaction with their tutor or other learners, and the learning materials, whether in print or electronic form, must take on some of this role.
- Learners always interact with 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 in additional interactive features, in particular, activities asking learners to think about something or to do something.

6.2 Why is interactivity important?

Interactivity in learning materials is important for some of 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 personalise distance learning materials and bring the writer closer to the learner.
- An interactive approach is likely to stimulate deep rather than surface learning. A 'deep' approach to learning refers to an intention to develop one's understanding and to challenge ideas, while the 'surface' approach is the intention to memorise information and to follow instructions.
- Interaction can stimulate many learning events, such as focusing the learner's attention or encouraging performance.

- Interaction is essential if print materials are to meet requirements for a 'learning dialogue'.
- Interaction can encourage active learning and ensure that learners try things out for themselves.
- An interactive approach can help learners to process new ideas and link them with their existing experience and so help to anchor learning.

> *Discussion*: Ask your participants for additional reasons why interactive approaches are valuable in designing open and distance learning materials.

6.3 What activities are typical in learning materials?

> *Discussion*: It is useful for the sections that follow to have sample course materials available from which to draw examples of activities, feedback, and assessment strategies.

To be effective in fostering interaction, activities must make explicit the active nature of learning. Activities should suggest to learners some of the more successful strategies they may adopt to achieve a particular objective. These activities must:

- be relevant to the learner's own objectives;
- be worth doing because learners are busy people;
- be inherently challenging and interesting; and
- include a variety of opportunities for interaction that will suit diverse learning styles.

Types of activities

Using different types of activities will make your learning materials more interesting. Activities can be classified according to:

- action needed to arrive at response;
- type of response demanded; and
- level of difficulty (or cognitive level).

Examples of the kinds of activities learners may be asked to undertake include

- reflecting on what they have read, heard, or seen;
- reflecting on their own experience in relation to what they have read, heard, or seen;
- describing personal experiences;
- consulting an expert source (for example, dictionary or local expert);
- reading a piece of text;
- listening to a tape;

- performing a calculation;
- carrying out practical work;
- examining experiment results; and
- observing aspects of their own surroundings.

As to the type of response requested, examples include

- writing down answers;
- making a summary;
- filling in or completing a table or chart;
- making glossaries;
- drawing a diagram;
- asking questions of friends or colleagues;
- repeating aloud a phrase or answering a question aloud; and
- performing some physical movement.

6.4 How do you make learning materials interactive?

Strategies for making text interactive

Learning materials can be made more interactive by including the following:

- activities that focus a learner's attention on the subject;
- activities that encourage learners to reflect on their existing knowledge and experience that may be relevant to the subject;
- activities that suggest ways in which learners can apply what they are learning;
- problem solving activities;
- project work; or
- a question and answer approach, exploring a subject through a series of questions which encourage learners to carry out their own analysis.

Encourage learners

Ways of encouraging learners to make the most of activities include

- explaining why the activities have been added;
- describing the advantages of an active approach to learning;
- explaining the purpose of each activity;
- highlighting the benefits that activities will offer learners;
- integrating activities into the course assessment;
- creating a range of types of activities; and

- avoiding activities that require large mental leaps away from the line of thought pursued in the materials.

6.5 What kinds of feedback are needed?

Designing activities that encourage interaction is one side of the coin; the other side is providing feedback to le arners so they will know whether they are on the right track.

Print materials

Mechanisms for offering this feedback when print materials are the primary learning resource include:

- providing sample answers in the print materials, either directly after the question or at the end of a unit;
- providing the page numbers of the set texts or other readings where these questions are discussed, answered, or both;
- providing sample answers on audio cassette;
- suggesting that learners contact the tutor to discuss their answers;
- asking learners to send their answers to their tutor so the tutor can give them written or oral feedback; and
- designing face-to-face tutorial sessions that actively engage learners and provide them with immediate feedback on their performance.

Othe r media

Some examples of providing feedback when using other media include the following:

- *audio cassette*: asking the learner to stop the tape in order to perform some activity (such as answering a question) and then start the tape again for feedback on tha t performance;
- *video cassette*: using a question-and-answer format in the video programme;
- *audio conference*: ensuring that participants have frequent opportunities to work off-line in small groups (you can use the site format effectively here) and then come back on-line for reporting and feedback;
- *video conference*: using a question-and-answer format and avoiding straight lecture formats; and
- *computer conference*: proposing questions for consideration and discussion and then moderating effectively by summarising the discussion from time to time, prompting further discussion, responding in supportive fashion to specific statements, and so on.

6.6 What are some assessment strategies?

Why assess?

Assessment in open and distance learning may have any of three main purposes:

- *formative assessment*: to give learners feedback on their progress so that they know how well they are doing and can, if necessary, change the way they are tackling the course;
- *summative assessment*: to provide the basis for marks that may contribute to the learner's eventual certification ; and
- *as part of the overall evaluation process*: to help the open and distance learning institution to monitor the effectiveness of its courses.

Who should assess?

Assessment may be carried out by any of a number of people, including:

- *the learner him or herself*: generally called self-assessment;
- *other learners*: called peer assessment;
- *the learner's tutor*: often through *tutor-marked assignments* that are built into the course;
- *examinations:* an examiner or assessor, as may sometimes be the case with summative assessment; and
- *course evaluation*: someone else, perhaps a researcher evaluating the course.

How can formative assessment help learners?

Formative assessment can help learners learn in a number of ways:

- *diagnosing learning needs*: early on in a course, assessment can help learners decide which parts of the course they need most, and may form the basis of a learning contract;
- *checking progress*: self-assessment questions during or at the end of study units enable learners to check how they are getting on and provide immediate reinforcement of learning;
- *increasing motivation*: reinforcement helps to keep learners going;
- *providing feedback*: tutor comments on tutor-marked assignments ensure the learner knows what to do next;
- *encouraging a deep approach to learning*: particular types of assessment such as questions that call for reflection, analysis, or application, projects, and practical assignments can help learners improve their approach to learning;
- *facilitating contact between learner and tutor*: tutor-marked assignments are often the main point of contact between a learner and his or her tutor, and are therefore an invaluable way of reducing learner isolation; and

- *increasing learner control*: giving learners the means to assess their own progress can increase their control over their own learning.

When to assess?

In deciding at which times during your course assessment is appropriate, here are some points to bear in mind.

- Early in the course learners may not have learned enough to warrant testing.
- On the other hand, an early assignment provides an opportunity for early interaction and feedback and thereby builds the relationship between learner and tutor.
- Assessment should be related to major sections of content.
- Assessment should be evenly distributed throughout the course to generate regular feedback.
- Keep in mind the turnaround time and capacity of your tutors.
- If an assignment is prescribed very late in the course, learners are unlikely to receive feedback before any end-of-course examinations.

7. Managing the learning materials development process

The process of developing learning materials begins with the initiation of a new course and follows right through the design, approval, writing, production, delivery, formative evaluation, summative evaluation, and rewriting process.

7.1 Aspects of the development process

Some of the aspects that are important for the management of this process are:

- choosing appropriate media and technologies;
- costing the process accurately and monitoring costs on an ongoing basis;
- recruiting and contracting staff;
- providing staff training, in specialist skills and also in effective teamwork;
- motivating staff on a continuing basis;
- setting performance targets and monitoring their achievement;
- ensuring that the development process is smoothly integrated with the other functions of the organisation, including recruiting, enrolling, production and delivery, learner support, and evaluation; and
- adhering to legal requirements, especially copyright.

7.2 Personnel involved in management

In a sense, all those within open and distance learning share some responsibility for managing course development, even though they may not recognise this aspect of their jobs:

- dean and heads of schools;

- subject specialists;
- writers of print materials, electronic text, and scripts;
- media specialists, for example, radio and television producers, computer-assisted learning developers, and computer-mediated communication specialists;
- budget managers;
- support staff;
- editors and graphic designers;
- librarians;
- copyright specialists;
- printers;
- dispatch clerks;
- tutors;
- markers;
- study centre staff; and
- evaluators.

Who bears overall responsibility?

Technically in materials development it is usually the chair of the development team. In practice, these people are effective only if all within the process share the management and work together.

> *Discussion*: Ask your participants to describe the staff that are or are likely to be involved in the materials development and production processes in their organisations.

7.3 Evaluating your design process

Why evaluate?

In practice, managers evaluate for a variety of reasons, including:

- to prove they have done it, lest it be done 'on their behalf' by someone else;
- to be able to make informed judgments about the effectiveness of the process and the outcomes; and
- to determine where there are problems in the process so they can be solved.

What to evaluate?

The aspects of the design process that are typically evaluated include:

- the planning process by which the materials were produced;
- the proposed aims, objectives, and content of the materials being designed;
- the proposed teaching strategy; and
- the appropriateness and effectiveness of the media chosen for implementing the strategy.

Preliminary evaluation

All of these aspects of the design process might be evaluated before the learners ever begin studying the materials. It can be valuable to have an outside 'expert' look over your materials before you make them available to learners, paying attention to aspects such as academic credibility and likely effectiveness.

Academic credibility

You might want to ask some expert in the subject matter questions about your materials such as those in the following checklist.

Checklist to Evaluate Academic Credibility in Learning Materials

- ❑ Are the aims and objectives sufficiently explicit?
- ❑ Do the aims seem relevant to the needs of the target audiences?
- ❑ Do the objectives support the aims?
- ❑ Are there any additional aims and objectives we should include?
- ❑ Is the content up-to-date?
- ❑ Is the content accurate?
- ❑ Are there any important omissions?
- ❑ Do there seem to be any faults of emphasis?
- ❑ Are the assertions made adequately supported by evidence?
- ❑ Do the materials avoid oversimplification or overgeneralisation?
- ❑ Are they true to the nature of the subject or discipline?
- ❑ Are they balanced, and at pains to present opposing points of view when appropriate?
- ❑ Are the media that have been selected being exploited appropriately and to their full potential?

Likely effectiveness

The questions in the following checklist can be asked about how educationally effective the materials are likely to be.

Checklist to Evaluate the Likely Effectiveness of Learning Materials

- Does the structure seem sensible and coherent, using introductions or previews, and summaries or reviews where appropriate, and providing a means that allows learners with different needs to use the lesson in different ways?
- Are adequate steps taken to motivate the learners and make clear to them what they are to do with the material and to get out of it?
- Are the materials pitched at the right level of difficulty and matched to the assumed prerequisite skills and understandings of learners?
- Is the tone that of a rigorous but friendly tutor, lively and interesting?
- Is the language plain and straightforward?
- Are analogies, examples, case studies, and illustrations used where appropriate to develop understanding?
- Are questions, exercises, and activities properly integrated into the materials to encourage learners in the self-assessment and practice of relevant skills?
- Are print and electronic media effectively integrated?
- Is the form of presentation conducive to effective learning?
- Are learners given sufficient information and practice of a kind likely to help them achieve the objectives?
- Is the relationship between assessment items and aims and objectives clear?
- Are assessment items clear in what they demand of learners?
- Are assessment items likely to result in answers that can be marked with reasonable consensus of agreement among different markers?
- Is the likely learner workload reasonable for the topic?

Discussion: A useful exercise at this point is to have sample course materials available for participants to assess against these checklists for appropriateness to their own contexts.

Developmental testing

Developmental testing involves trying out materials with learners in the hope of developing or improving those materials for the benefit of other or future learners.

Methods of developmental testing include:

- *tutorial tryouts*: trying the materials out on one learner or a small group of learners; and
- *field trials*: using larger numbers of learners (20 or 30) in circumstances as similar as possible to those in which your eventual learners will work.

Continuous monitoring

Once the learning materials are in delivery, you will want to 'keep an eye on things' to see what problem areas need addressing, what good things are emerging and should be enhanced, and what to prepare for end-of-course evaluation.

Mechanisms available for this kind of formative evaluation include:

- *a course log book*: used to record the main things you notice in the running of the course and the main in-course corrections you have used;
- *casual evaluation*: appraising what is happening in day-to-day situations and responding to it; and
- *deliberate evaluation*: actively seeking specific kinds of information, through discussions, interviews, and questionnaires.

Summative evaluation

When the course is completed, a summative evaluation of its effectiveness may address questions such as those in the following checklist.

Checklist for Summative Evaluation of Course Effectiveness

- ❑ Did the course attract enough learners?
- ❑ Were they sufficiently qualified?
- ❑ Did enough of them last the course?
- ❑ Was the standard high enough?
- ❑ Was the course cost-effective?
- ❑ Were the learners satisfied?
- ❑ Were other stakeholders satisfied?
- ❑ What needs to be changed?

Typical instruments and sources for obtaining this information include:

- *questionnaires*: for learners, for tutors, and for others involved in delivery;

- *interviews*: with selected learners, with tutors, and with others involved in delivery; and
- *records*: course registrations, revenues, expenditures, completions, and passes.

> *Example*: For an example of an institution that evaluates its courses and services on a regular and continuing basis, see the case study included in this kit for Deakin University.

8. Practice exercise

8.1 Assessing sample materials

Instructions: Consider a sample of course material prepared for teaching at a distance. Assess the extent to which it meets the criteria set out in this session. This task can be divided up among the participants, one criterion per person, two or three criteria per small group, and so on. The last criterion (administrative requirements) cannot be dealt with in this way, but the group could be prompted to engage in a general discussion of the kinds of administrative problems they encounter in delivering instruction effectively to learners.

Timeframe: Approximately one hour.

Materials: Sample course materials. If you do not have ready access to sample course materials, The Commonwealth of Learning will assist you to locate appropriate packages.