PRODUCING MANUALS FOR HEALTH WORKERS: How to do it

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CONTENTS

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Introduction

This booklet has been written for four main reasons:

- to bring to the attention of manual writers some areas of consideration that have often been ignored;
- to share some experiences in writing manuals;
- to offer some guidelines to manual writers, based on these experiences;
- to stimulate further discussion, research and work on producing better manuals.

In this booklet the term "manuals" has been used rather than "health learning materials" as simpler and more familiar. It has been used fairly interchangeably with more general terms such as "books", "textbooks", "handouts" etc. I believe that we all know what we mean when we talk about "manuals" and that further debate on terminology is unnecessary.

Equally, the term "health workers" has not been precisely defined: there are too many diffrent kinds in too many different countries and programmes.

However, the saddle of common-sense upon the horse of imagination should, I believe, carry the reader to an application of "manuals for health workers" that is appropriate to his situation.

CHAPTER ONE

WHY ARE MANUALS NEEDED?

The shortage of learning resources, and in particular books, for health workers around the world is notorious. Yet why are books so important?

- They are an information resource for students and teachers on what is to be learned.
- They help to standardize both training and on-the-job performance, where these are often very varied in practice depending on quality and quantity of facilities, teachers, curricula and working conditions.
- Appropriately written and used they can help to improve both content and methods and quality of training.

A world bank report on school textbooks and teachers noted:

"From the evidence so far, the availability of books appears to be the most consistent school factor in predicting academic achievement. It is positive in 15 out of the 18 statistics (83%). This is, for example, more favourable than the 13 out of 24 (54%) reported recently for teacher training." (1)

This evidence from less industrialised societies, while referring to schools rather than post-school training, is significant. It is reflected in growing demand by Agencies, teachers and students for books, and all forms of teaching-learning materials:

"There is need for more learning materials for students and resource material for teachers. The learning material should be designed to promote active student participation in the educational process." (2)

A workshop convened in 1976 by the Commonwealth Regional Health Secretariat and the African Medical and Research Foundation to examine the availability of books and learning resources for health workers in East, Central and Southern Africa confirmed:

"that the shortages of appropriate teaching materials seriously decreased the efficiency and effectiveness of many existing training programmes ....." (3)

The workshop identified the "serious gaps" in the availability of materials as:

- Job-oriented functional books related to non-hospital situations of all types, at both senior and junior level.
- More theoretical books but adapted to African disease patterns."

Happily, in more and more countries, educational techniques for producing learning material, distance teaching material, supervisors' guides, procedural checklists, reference manuals and on-the-job work manuals are being applied. This is perhaps one of the most cost-beneficial aspects of the whole primary health care concept.

D.H. Wood, addressing the Third Commonwealth Ministers of Health Regional Conference in Nairobi in 1975 said:

> "With all the shortages we have -- numbers of trained people, schools, experienced teachers, etc. -- that are going to take a long time to build up, the lack of appropriate and available books is a very serious handicap." (3)

Wood went on to describe an important aspect of books: that students must own them.

> "Much could be said on the problem of availability of books but this is not the time and place to dwell on anything other than one basic concept. If a health worker is going to maintain and develop his knowledge after he finishes his basic training he must continue to have access to books and journals. The common practice of issueing books during training and recalling them on qualification is comparable to training a carpenter and taking his hammer away before he starts to build. Every health worker should finish his training with one, two or five books that he takes with him."

What has already been done?

Until the mid 1960's the majority of books for health workers were of two sorts: locally produced material, and the well-established books from Europe and America. Locally produced material was normally the result of energetic individuals or teams working in particular countries and programmes. It was often highly specific to the particular workers involved in the programme; it was seldom professionally published; it tended to arise from the personal experience of the writer in his or her teaching or supervisory work; and it seldom achieved widespread distribution beyond the particular programme it was written for.

Examples are the "Handbook for Medical Assistants for use in Rural Health Units" from Malawi (4) "Handbook for Dispesary attedants and medical field unit assistants" (5)c originally written for Nigeria in 1942; and the Midwifery and MCH Manuals produced in Papua and New Guinea (6) originally written in 1958.

The well-established textbooks from Europe and America were often even older; "Aids to Tropical Hygiene and Nursing" (7) was originally written in 1944; "Anatomy and Physiology for Nurses" (8) was first published in 1939; "The Control of Disease in the Tropics" (9) first in 1956. Some of these books have indeed stood the test of time well; most however were oriented to western needs and situations, with little relevance either in content or presentation to the needs of health workers training and working under quite different conditions in newly-independent countries.

In 1962 Jelliffe's "Child Health in the Tropics" (10) was published; and in 1966 Maurice King's "Medical Care in Developing Countries" (11). These two books were perhaps the greatest stimulus to the revolution in learning materials that was to come. Both were written specifically for a wide range of indigenous medical and para-medical personnel working in developing countries. Both were published by major publishing houses; both achieved rapid world-wide reknown. In the years immediately following, many of the well-known, highly experienced figures in the new health care approach produced books; United Nations Agencies, Non-Governmental Organizations, Country Programmes, Schools of Medicine and the big publishing houses turned to textbooks, manuals, hand-books and the production of series of manuals. For instance: "Mother and Child Health: Delivering the Services" (12): "Community Nursing in Developing Countries" (13), "Nutrition for Developing Countries" (14), the McGraw-Hill International Health Services Series with Professor N.R.E. Fendell of the Liverpool School of Tropical Medicine as consulting editor, had by 1974 covered four topics: Midwifery (15), Community Nursing (16), Medical Care (17) and Laboratory Services (18); the African Medical and Research Foundation published the first in its Rural Health Series in 1975 (19), and by 1980 had eleven titles in the series; in 1972 the World Health Organization started the REMAHA project (Reference Material for Health Auxiliaries and their Teachers) screening and classifying 208 items to produce a "recommended library". In 1975 an annotated bibliography on the Training of Auxiliaries in Health Care (20) listed some 300 titles.

During the mid-1970's, however, Ministries of Health in many third world countries were turning away from these centrally-produced books and series, and trying to produce their own, official manuals, for their health workers. The four volume "Health Centre Reference Manual" for Indonesia was first produced in 1976; the "Multi-purpose Worker Manuals, Male and Female" were produced by the Government of India in 1978; a similar series has been produced in Pakistan. Sri Lanka has produced its "Family Health Manual": a reference manual for all its para-medical cadres.

Kenya is producing the "Rural Health Practice Manual", as the basic of its Rural Health Development Project training; the African Medical and Research Foundation's Rural Health Series has long been planned as the basis for the Medical Assistant curriculum in Tanzania. There has been a similar development of manuals in South and Latin America, China, West Africa and the Middle East. There have been many different approaches to how, why, and where these manuals are produced and expected to be used.

CHAPTER TWO

WHAT MAKES A GOOD MANUAL? AN OVERVIEW

The writer of a manual or technical book faces two demands: his material must be relevant, and it must be usable. A relevant book is one that matches the user's needs; it contains what he needs to read. It may or may not be usable. A usable book matches the user's abilities; it is presented in such a way that he can use it, even though it may or may not be relevant. Relevance thus refers to the content, usability to the presentation. The two are closely related, and both are important.

Usable, irrelevant books are no more appropriate than relevant, unusable books.

Relevance

The search for relevance in manuals must concentrate on three area:

- The relevance of health technology to the health problems and needs of the communities in which it is to be used.
- The relevance of the technology to the level of understanding, competence, and responsibility of the health worker using it.
- The relevance of the material to the situation in which it will be used (eg. resources available, facilities etc.).

The writer of a manual must therefore find his place within a series of discrete steps:

- Identify health needs and appropriate interventions.
- Specify appropriate job descriptions.
- Identify the competencies needed to fill those job descriptions.
- Design training to provide the required competencies.
- Produce supporting material - for the training itself, for continuing education, and for reference and guidance after training.

Note that this throws doubt on the relevance of 'global' manuals for any particular programme, and upon the use of manuals designed for particular programmes in other situations.

Different Aspects of Relevance

The following quotations from some of the manuals in the series produced by the African Medical and Research Foundation (AMREF) illustrate different aspects of relevance:

- "This manual was written at the request and with the help o the ..... Training Centres' in ..... The goal was to cover all aspects of child health in the ..... syllabus." [Relev the workers and to local needs].

- "The sections of the book on management and treatment are written with the facilities available in health centres in mind ..... " [Relevant to the situation and to local conditions].

- "To the student: This book is probably different from others that you have used. The method that it uses is 'self-learning'..... "To the Instructor: This book is not intended to substitute for regular teaching activities ..... If it is used correctly, however, we believe that it will hel you to make more efficient use of your teaching time..... [Relevant to the use of the book].

These aspects of relevance are covered in more detail in Chapter 5.

Usability

In recent years, concern for the use of all books and learning materials has gone beyond the basic concepts of "literacy" and "understanding." Many new terms are used in our assessment of learning resources: readability, comprehensibility, communicability, usability. All these terms suggest the wide range of problems encountered. These problems tend to fall into three main areas:

- the cognitive demands of learning from reading, following instructions, making decisions, applying information, and solving problems;

- the operational demands of referring to material, using an index, interpreting pictures and diagrams, using appropriate reading strategies (mainly adjusting the speed at which to read);

- as far as health workers are concerned, a further area of concern is in the professional demands of applying generalized knowledge of health to the particular cases of patient or community needs.

Behavioral, educational, and linguistic research have suggested that there is no one answer to these problems. Rather, the solution seems to lie in selecting the appropriate presentation of material to suit the needs of particular readers and situations. Selection is necessary in four aspects of presentation:

- designing or structuring the material to suit the situation for which it is needed -- as learning material, for general reference, for teaching, for on-the-job guidance;

- controlling the language in which the material is written to match it to the reading level of the readers;

- Adjusting the physical layout of the material to suit the needs and skills of the readers, eg. use of nonprose formats (such as notes or flowcharts), illustrations, diagrams, tables;

- Considering the need for training in the use of the material; introducing it in non-training situations, teachers' guides, supplementary exercises, and so forth.

Unfortunately, few if any manuals contain sentences like this:

"The language and layout in this manual have been carefully controlled, to help you read, look up and learn from it." [Usable by the workers].

Usability, and ways of achieving it are described in more detail in Chapter 6.

Conclusion

Much existing health learning material is open to criticism as regards both relevance and usability. Shortages of books has led to the use of inappropriate material for a wide range of health workers. Failure to demand specification of relevance and usability has led to the questionable assumption that material in use is, a priori, relevant and usable. Some of the problems this has produced, and evidence of this, are described in the next chapter.

CHAPTER THREE

WHAT ARE THE PROBLEMS WITH MANUALS?

In the first half of this chapter I shall describe four major factors in the writing of Manuals for health workers, and some of the problems that arise. These four factors are:

- Who writes manuals
- Who reads them
- What the role of a manual is
- New developments in writing manuals.

In the second half of the chapter I shall describe some particular problems that occur in the use of manuals, and summarize some difficulties that research has shown difficulties readers have in reading and using their manuals.

Who writes Manuals?

The earliest, locally produced material was usually written by practising doctors involved in the training and supervision of the programmes they had been largely instrumental in organizing and running. The world-wide manuals that sparked off the great interest in material for such programmes were produced largely by doctors dissatisfied with the kind and quality of health care they found in these programmes, as an attempt to introduce new concepts and technologies into the health care systems of the developing countries they were working in. The reversion to locally produced material has followed the same pattern: health personnel in particular countries trying to produce material suitable for the particular problems and conditions of their country, and grappling with the immense technical problems of providing health care to largely rural, largely isolated, largely uneducated "clients". The writing of a manual has therefore been seen as primarily a problem of getting the medicine, the content, right.

Most experienced manual writers feel that the main purpose of a manual is to answer the question: "What is the worker supposed to do?" The introduction to "Primary Child Care" (1) states: "this book describes how we should care for children. It shows us how a child should be examined, diagnosed, managed and treated". The Preface to the "Community Nursing Manual" (2) states "It is impossible to put in one book all that community nurses should know. They cannot know enough. Even more important than new knowledge is the need to use the knowledge already possessed

"To the Reader", in "Child Health" (3) states: "Just as this book will need to be periodically revised and brought up to date so your knowledge must be continually refreshed.." The Preface and Objectives of "Community Diagnosis and Health Action: a Manual for Tropical and Rural Areas" (4) states: "This book has been set out so that Section 1 gives an overview of community diagnosis: what it is and how it is done. Section 2 deals with methods and approaches to obtaining information..."

Two problems are likely to arise from this sort of authorship. One is the nature of what the writer writes, the other is the competence of the writer. To look at the first problem: the concern of the writers, being health practitioners, is to establish the health technologies they advocate. Thus manuals for health workers, and indeed most other learning material, have been largely seen as information stores, or data-banks; a resource for the student; a statement of the content of what the student is to learn. Little attention has been given to the activity of the student learning from this manual. As Penter & Telder (5) say "...textbooks have often been written more to satisfy an author's need for logical organization of content than a student's needs for psychological organization of something to be learned."

Secondly, even where writers do wish to adopt a more educational approach to manuals and pay more attention to the needs and activities of the readers, they are seldom qualified, let alone experienced, in the writing, designing and production skills of preparing learning materials as opposed to the verbal skills of teachig. Though, indeed, many writers of manuals have many years experience in teaching students, their skills in teaching have usually been learned as a response to their working situation, with little, if any, real training.

Who reads Manual?

The earliest local manuals were usually produced for a very definite audience: the students or workers involved in the particular programme. As interest in manuals and in the training of health workers expanded, however, it became clear that many of the problems faced by these workers and much of what they had to learn, were common to many different countries and situations. At a Symposium for World Health in 1970 organized by CIBA, D. Baker, Professor of International Health at Johns Hopkins University said:

> "Since many of the training needs of auxiliary health workers are the same in different countries, economies could be achieved by having 'universal' textbooks." (6)

the tendency therefore developed to write manuals for very wide-ranging audiences. This tendency was exacerbated by the fact that writers and trainers found that much of what they taught fairly junior workers was equally applicable to more senior workers as well; even to the doctors, whose training in western medical schools, or local models of these, was often quite out of touch with local condition and needs.

The Introduction to "Child Health in the Tropics" (7)) states: "It is hoped that this brief account has been prepared in a suitable form for use selectively by medical and paramedical personnel and especially by instructors and trainers of these various types of staff." The Preface to "Care of the Newborn baby in Tanzania" (8) states: "This manual was written for Tanzania Medical Asistants, but nurses, rural medical aids, medical students and doctors should find it useful". Perhaps the most wide-ranging audience was that envisaged for "Obstetrics, Family Planning and Paediatrics; a manual of practical management for doctors and nurses" (9). The introduction to one chapter states "This chapter is intended as a guide for the midwife managing a normal delivery, the midwife who has to cope with the more complicated situation, and the doctor who has to deal with a frankly pathological situation."

The problem here has been summed up by Penta & Telder (5)a

> "When a book review ends with the comment that the volume will be useful to medical student, intern, resident and practitioner alike, it is generally safe to conclude that the book will not really be useful to any of them. Such is the case with many instructional aids which have often been produced to serve the needs of an author, designed for others like him, and then shown to groups of varying levels of sophistication and interest in the hope that some portion of the presentation will serve their needs."

This problem is greater when the range of readership varies from the junior worker with limited basic education, to doctors or senior workers with the best education their country can give..

With experience, and the results of research into such factors as varying reading abilities among different cadres of workers, manual writers have recently been stressing the importance of carefully selecting the intended audience of any piece of material.

What is the role of a Manual?

The third major factor to be found in the development of manuals over the last 25 years reflects confusion as to the role of a manual: its place in a continuum of resources from curriculum to reference book. Early manuals were often written as a supplement to, or extension of the teaching and notes given to the students. Their use as a resourse was established in close contact between trainer and trainee. With the wide-spread production of manuals, however, this close contact, and common understanding of the role and nature of the manual has sometimes been lost.

In the McGraw Hill International Health Services Series, one volume, "Medical Assistant's Manual" (10) is "desiged to help the medical assistant in his front line task of diagnosis and treatment .... If he cannot make a diagnosis at once, he can look up the patient's main symptom in the Symptom Index at the back of the book..." (Preface). This is clearly a manual to be used on the job. Another volume, however, "Community Nursing Manual" (2), is "intended for use during training. In addition, it should prove a useful source of reference for practicing nurses" (Preface). "Primary Child Care" (11) suggests: "Try to get a copy of this manual for yourself. Learn from it while you are in school, look things up in it afterwards. Don't read it from the beginning to the end. Don't learn it by heart. Instead, learn how to use it."

"Pharmacology & Therapeutics" (11), number 5 in the AMREF Rural Health Series, has been developed from lecture notes prepared to cover the syllabus for Medical Assistants (Preface). Similarly "Child Health" (3) number 1 of the same series, aimed "to cover all aspects of child health in the medical assistant's syllabus" (Acknowledgements). These two are clearly textbooks, to be used in training. Yet the general editors of this series indicate that students are expected to keep the books with them after their training for reference, and on the job guidance. In the case of this series, this multi-purpose role is deliberate.

Many manuals, however, either do not indicate where on the continuum from initial learning resource to reference book or operational guideline they are primarily intended to fall, or are deliberately intended to cover the whole continuum, as in the case of the Rural Health Series and Dr King's manual mentioned above. Yet as Srivastava says in his investigation of India's Community Health Workers manual:

"One would wonder how all three functional measures (learning resource, reference book, operational guide) could be lumped together as 'three-in-one' in the same manual.

As each of these three functional uses of the manual demand distinct perspective and orientation of its form and content, it is advisable that there be three variants of one and the same manual". (12)

Few manual writers at present accept Srivastava's hypothesis.

New Developments

The fourth and final factor to be considered concerns the fact all responses to changes and new approaches in training and training methods for health workers: those have virtually all been medical. It is only to be expected that the primary response should be a medical one; what is significant, however, is how little other disciplines, such as education, sociology, psychology or linguistics have been invited to respond to this major field of development. So far, remarkably little expertise from other, deeply concerned disciplines has been brought to bear on the problem of writing manuals. Notwithstanding advances that have been made in educational theory, socio-linguistics and readability measurement to mention a few crucial areas, very little of this new knowledge is utilised in the writing of manuals.

It is only very recently that any attempts have been made in this field. Maurice King early on attempted a frequency word count for his Nutrition Manual (13) and in 1977 engaged the present writer to systematically simplify (at syntactic level) the text of his Child Care book (1). A major break-through in this field was the project conducted in India in 1978, where the Department of Linguistics of Delhi University was engaged to evaluate aspects of the Indian Community Health Workers Manual (12). Some of these ideas have been used in attempts to evaluate the Rural Health Series Manuals from an educational and linguistic stand point. Yet very few other attempts of this nature have been made. Too many manuals are based on the assumption stated in the introduction to "Where there is no Doctor" (14): "Any one who can read can use this book".

A few notable exceptions should be pointed out, however, to a number of the points made above. One is the Government of Pakistan Health Division's "Mid-level Health Worker Training Programme Modules". These modules combine as a manual, structured round a competancy-based curriculum, including learning objectives and activities as part of the technical content. This must be seen as an important step forward, and potential model for future manuals.

Another is the Sri Lanka Family Health Manual for which, before printing, work was done to simplify and control the language in which the manual was written, and to pre-test translations into the other two local languages: Sinhala and Tamil. A third exception is the "Operational level Training Manual" for the Kenya Expanded Programme on Immunization.

Notwithstanding what has been said above, there are many manuals that do not fit neatly into the framework that has been used. It is intended, however, that this overview will indicate some general trends in manual writing over the last 30 years, and help to identify some of the problems that are of pressing concern to those engaged in the production of manuals. This is not to condemn all previous manuals, and all attempts to support and improve the training of health workers. It is rather to provide a framework for consideration of the kinds of manuals currently in use for training health workers, which will lead to discussion of some of the kinds of problems found in writing manuals. This discussion will, it is intended, enable some solutions and some guidelines for manual writers to be suggested in later chapters.

Problems with The Use of Manuals

To highlight problems with the use of manuals by readers, a summary is now given of an investigation into how far readers were able to use one of the Rural Health Series of Manuals published by the African Medical and Research Foundation in Kenya.

The investigation concerned the first in the AMREF series, "Child Health". This manual, published in 1975, aimed "to cover all the aspects of child health in the Medical Assistants' (of Tanzania) Syllabus." The primary audience is therefore the Tanzanian Medical Assistant, and his Kenyan counterpart, the Registered Clinical Officer. It was hoped, however, that a much wider range of health worker would find it useful: for example, Community and Enrolled Nurses, and Rural Medical Aids.

The investigation chose four areas of use of the manual to concentrate on:

- reading the text fluently
- looking things accurately
- interpreting the nature and purpose of the texts within the manual
- transforming the generalised, formal information given into practical, particular applications.

Full details of this investigation are available from the African Medical and Research Foundation, P O Box 30125, Nairobi.

A series of tests were constructed on the manual to give quantitative, objective indicators of performance in these areas. These tests were then given to nearly 300 student health workers, from a variety of cadres, in Kenya and Tanzan Results from these tests showed that the manual, while suitab for some of its intended primary audience, was by and large t difficult for other cadres of worker to use.

- Reading the text fluently

  As far as reading the text fluently was concerned, Clinica Officers in Kenya could manage it well. No other group cou as a whole. Less than half the Medical Assistants could rea text fluently, without help. Table 1 gives an example of readability scores for different cadres on one text from th manual. It should be noted that this was one of six texts t from the manual for testing. Some were slightly easier, som far more difficult. In one text, the average of every cadre performance fell at "frustration level": very few of any gr could read it.

- Looking things up

  With regard to looking up in the manual, a similar situatio found. Only students in their final year of training, who h been using the book for some time, scored more than 60% accuracy in looking up the answers to questions in the book The overall average for all the workers tested was 50%. Thi can be interpreted loosely that when Health Workers try to refer to the manual, they can only find the information the want, even if it is in the manual, half the time.

- Interpreting the nature and purpose of the text

  Results from tests to see how health workers interprete the nature and purpose of the different texts in the book were less revealing. Deficiencies in the test design made this p of the investigation difficult to interpret.

  A general trend seems to be, however, that health workers do not clearly distinguish between parts of the manual that are generalised information to be learned or parts that are operational procedures to be followed practically. There see to be indications that students generally feel that a manual is purely a store of information to be learned, rather than book containing information that can be applied in practice, well as learned for passing exams.

Application of formal knowledge

The most significant, and striking set of results, however, comes from the tests of the application of formal knowledge. Most cadres scored well on questions that required information learned from the manual to be reproduced in a formal framework: eg. the clinical features, complications and treatment of whooping cough. The same groups scored badly however, when asked to use this information to answer questions like:

You see a child with whooping cough:
- What would you ask his mother and look for?
- What would you do for him?
- What would you look out for until he gets better?

Among Clinical Officers a difference of 20%, and among Medical Assistants a difference of 30%, between two scores on the two sets of questions was found.

Looking at these results overall, we can see that the manual's usefulness is limited to a fairly restricted audience: Clinical Officers and the better Medical Assistants, who have used the manual extensively in their training. At least half the Medical Assistants find it very difficult to read. Even Clinical Officers, approaching the manual for the first time find it difficult to locate information in it. For other cadres of health worker, difficulties in reading and referring to the manual are much greater. For some, notably Rural Medical Aids and Enrolled Nurses, overwhelming. All the health workers without exception find it very difficult to see how the information in the manual is applied in practice.
How far do these results show how useful the manual is? Obviously, if a Health Worker cannot read his manual, it is useless to him. Similarly, if he cannot refer to it accurately, its usefulness is limited. Yet these results should not be overemphasized. Many of the workers tested could read at the "instructional level": that is, with some help from teachers or colleagues.

The tests showed that familiarity with the manual increased the accuracy with which readers could look things up in it. All the workers were students in training: their ability to cope with practical situations was therefore still limited in many ways.
There is still, however, clear evidence that the manual cannot be used as easily and as well as we should hope and expect. It would obviously greatly be desired that this manual, and future manuals, could be improved to make them more easily read, understood and referred to. To do this it is necessary to examine more closely how the sort of things tested here are realised in manuals, and how far they can be controlled.

This means to examine what manuals are, and how they are used. It will then be necessary to look at the concept of "usability" and how it can be analysed and achieved.

Table 1:

CLOZE TEST CH/6

Number of subjects at different readability levels

	Clinical Officers 1st year	Community Nurses 3rd year	Medical Assistants 3rd year	Rural Medical Aids 2nd year
Fluency level	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○
Instructional level	○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○
Frustration level	○ ○		○ ○ ○ ○ ○ ○ ○	○ ○

Each dot represents one subject

The distribution of subjects in four groups at different readability levels is shown in the table.

Note that while the majority of community nurses fall in the fluency level, a large minority (37%) fall in the instructional level. Among Medical Assistants the situation is even more marked with 7 members of the class falling at frustration level. These two groups are particularly interesting, as the average scores on the test for both are 60% (nurses) and 50% (Medical Assistants). It would be a mistake to assume that the text is adequately readable for either class as a whole.

A further point to note is that the Medical Assistant group is in it's 3rd and final year. There will thus be little further opportunity for instruction to help those at the instructional level to cope with the text.

A final point is the clear difference between the RMAs and all the other groups. Only very few of the RMAs will benefit from the text, even with instructional help, while with the other groups, instruction could help most subjects to reach fluency level.

CHAPTER FOUR

PLANNING A MANUAL

How are manuals used?

In 1974, a document produced by Dr. R.J. McMahon, WHO Coordinator for Medical Auxiliary Training in Tanzania, defined a manual thus:

"It is a book which:
- contains basic, essential and minimal information on a subject
- is presented clearly at the level of education of the student
- contains operational instructions (how to do things)
- is entirely adapted to the job description (work) and syllabus of the student and therefore directly related to the local (national) medical conditions, and problems within the restrictions imposed by local facilities."

Dr. McMahon then outlined some of the advantages of manuals:

"(i) For the student
- All students know exactly the minimum they must know.
- It refers him to other sources if he wants to know more detail.
- It can be kept as a reference after qualifying.
- It saves the necessity of taking notes in lectures.

(ii) For the teacher
- All teachers know exactly what the students must know.
- Teachers don't need to make so many notes.
- Teachers don't need to give so many lectures.
- Helps expatriate teachers who are unfamiliar with rural medicine and (local) conditions.
- Makes transfers and taking over from other teachers a lot easier."

From this description it is clear that three possible, and connecting, users of the manual are envisaged:

- the student in training,
- the teacher doing the trainig,
- and the worker after training.

Different uses of a manual

From this we can infer that manuals can be used for learning, for teaching, for reference, for a combination of these. But these are distinctly different uses of a book; indeed, they are distinctly different uses of information, even though they may in practice appear inseparable. Cognitive strategies for learning differ from those for referencing, particularly with regard to learning from or referring to books. They are learned skills, less obvious, and more complex than we often realise.

This becomes clearer when we look at the way a particular user uses a book. Whenever a reader refers to a manual (as opposed to simply reading it for want of anything better to do) he has formed certain questions in his mind; the purpose of referring to the manual is to find the answers. This applies equally whether he is a student sitting in his study at the training centre reading up "Immunisation"; or checking up on a patient he saw in the morning's OPD clinic; or a teacher reading the manual in order to explain something to his students. Depending on what his reason is for looking in the manual, he is likely to have different sorts of questions.

What sort of questions do readers have?

It is useful to try to work out what the different sorts of questions may be. I have ound it helpful to divide them into 3 sorts:

(i) General "learning" questions, where the reader doesn't yet know what sort of information is likely to produce his answer.

(ii) Simple "reference" questions, where the reader (health worker) needs a single item of straight-forward information. In this sort of question the reader has identified precisely what data he needs, and formulated his question precisely.

(iii) Complicated "problem-solving" questions, where the reader needs a lot of information to help him solve a problem arising from a situation he is faced with. In this case the reader's question is much less precise; he may also need help in interpreting information to produce his answer.

For example:
Questions in (i) may be things like:
- What sorts of skin diseases are there?
- What is immunization?
- What causes scabies?

For these questions the reader is usaully looking for information to add to his cognitive store of knowledge, or experience. He does not intend to apply it directly. Locating the information is not usually such a problem because his questions are vague and unformed. He often only consciously forms his questions as he tries to structure the information he reads.
It is important here to distinguish between "information" and "knowledge". Information is data. Knowledge is data which an individual has stored in a meaningful way.

Questions in (ii) may be things like:
- Do I apply Benzyl Benzoate to the child's whole body for scabies?
- How long should Benzyl Benzoate be left on for?
- What drug and in what dose should I give for gonorrhoea?

For these questions the reader already knows how to apply the information he finds in the answer. He may, however, need help in locating the particular piece of information he needs.

Questions in (iii) may be things like:
- How can I get mothers to carry on the treatment for scabies at home?
- What should I and my colleagues do as a team to cut down scabies in this district?
- What can I do about unmarried mothers in this area?

For these questions the reader is usually looking not only for information, but also for how to apply it. He is often very unsure of how to locate the information that is relevant to his need.

The two dimensions of use of a manual

These three sorts of questions inter-relate with, but do not necessarily match, the distinction between reader as referencer, as learner and as teacher. There are thus two dimensions to the use or reading purpose, that users of manuals have. Both dimensions require purposive cognitive strategies on the part of the reader and may well require practical operational strategies as well: for example, how to use an index.

To help determine the precise use of a manual, and how these two dimesions apply to any particular manual, check-list of questions is suggested.

Planning a Manual

Here is a check-list of questions. When you start planning a manual go through this check-list. Tick the answer for each question that is most precise for your manual.

1. Why is the manual needed?
   - as a source of information for learning;
   - as a source of information for teaching;
   - as a source of information for reference;
   - to standardise performance in the field and establish levels of competence;

2. Who will use the manual?
   - trainees in training;
   - trainers doing training;
   - workers in the field;
   - supervisors, support personnel;

3. What will these people do with the manual?
   - learn from it;
   - refer to it for information they've forgotten or which is uncommon;
   - use it as an aid in problem-solving;
   - check procedures and actions;
   - teach with it;
   - use it as background reading;

4. How will they do these things?
   - read and learn in training;
   - read and learn on their own, without training;
   - teach with it in training;
   - look things up in it at home or in the centre;
   - check their performance with it as they do things;
   - take it to villages and teach from it;

5. Where and when will they do these things?
   - in the training centre;
   - at home;
   - in their office/centre etc;
   - in the villages, at the bus-stop, in peoples' homes, in the fields, at the village meeting place etc;

6. What should go into the manual?
   - explanations (background);
   - descriptions of situations, processes etc;
   - descriptions of procedures;
   - instructions for procedures;
   - lists, data, exact information;
   - teaching material for the reader to pass on;

7. How should we organise all this information and how should we present it?
   - as learning material;
   - as teaching material;
   - as reference data;
   - as exact instructions;
   - as regulations, standing orders etc;

8. Will it need any support?
   - teaching aids;
   - notes for the teachers using it;
   - a teacher's book, lesson plans etc;
   - supplementary exercises;
   - supplementary data;
   - supervisory check-lists;
   - administrative instructions or back-up;
   - instructions on how to use it;

You may find yourself ticking all the answers. Then you will have very great difficulty with your manual. You are not being precise enough about it. Or you are aiming at too wide an audience. However, if you are really trying to write such a wide-spread manual, try to break it down into sections, and answer the questions for each section.

The importance of this check-list lies in the relationship between the questions. The crucial question is question 2. Yet to justify question 2, the answer to question 1 is necessary. This then leads to questions 6 & 7. These are vital for the content and design of the manual. Yet 6 & 7 can only be precisely answered in the light of answers to questions 3, 4 & 5. Question 8 shows how important the support to a manual can be. It is also a way of coping with too many answers to questions 1, 2 and 3.

Conclusion

To summarize, it would appear that there are four crucial groups of questions to be asked in order to prepare a good manual.

Who are the readers?
- What do they know?
- What can they do?
- What problems do they have?

Why do they need the manual?
- What do they need in the text?
- What will they do with the text?

What should go in it?
- What should they know?
- What are they to do?
- How are they to do it?
- What are theyto teach?

How should we present the text?
- What factors do we need to take into account?
- How do we control these factors?

To try to suggest guidelines for the preparation of a manual, we shall look at each of these groups of questions in turn.

CHAPTER FIVE

GETTING THE CONTENT RIGHT : RELEVANCE

In this chapter we consider the three groups of questions 'Who are the readers of the manual?', 'Why do they need the manual?' and 'What should go in the manual'. The answers to these questions are important for ensuring the relevance of the content of the manual.

Who are the readers?

To answer the questions 'what do they know' and 'what can they do' it is necessary to specify very carefully exactly who the intended readers of the manual are to be. It is usually best to direct a manual at one particular level, or cadre of worker. Manuals aimed at several different groups of worker often end up suitable for none of them. This is because of the differences in different groups' basic education, training, job descriptions and expectations. Manuals can, in special circumstances, be written for different groups or cadres. But in these the role of each group has to be carefully specified.

When considering what the readers already know, and can do, it may be necessary to look beyond the syllabus of their training. If the readers have to use weight charts, for example, it is important to find out whether they understand graphs. It may be necessary to find out their level of school education, and see if graphs were covered in the school mathematics syllabus.
The answers to these two questions have great bearing on what you put in your manual, and how you arrange it. The answer to the third question, "what problems do they have?", is also important, both for content and for presentation. To show this, a number of common problems that health workers have will be outlined.

- Reading Problems

  Many health workers, depending on their level of background education, may be inexperienced readers. Many have to use manuals written in a language other than their mother-tongue. Many, therefore, experience significant reading difficulties with complicated language in manuals. Simplification of the language of a manual can produce dramatic results.

- Locating Information

  Many of the health workers who will use manuals find it difficult to use an index to look up something in a book. In addition, there may be many problems arising from the layout of pages or texts, from headings and numbering systems. If something is difficult to look up, readers usually either don't bother to look it up, or they find an inaccurate answer, or it takes them so long as to be a waste of time.

- Understanding the Nature and Purpose of Information

  Is the information instructions, suggestions or background information? Is it for learning, or for reference? Knowing the answers to these sorts of questions helps readers to understand and use information in manuals better. But they are the very questions that inexperienced readers often have difficulty with.
  Many health workers seem to feel that information in manuals is usually to help readers understand the principles of a topic, rather than practical instructions on how to do something. Consequently these workers feel that it is more important to learn the information than to refer to it or check up on it. They tend to think of manuals as textbooks to be learned by heart in their training rather than as practical manuals to help them on the job. While in some cases they may be right (to pass exams for example) their predisposition is to assume that all manuals are to be used like this.

- Applying the Information in Manuals in Practice

  People tend to learn information in the way it is presented to them. They then often find it difficult to apply this information in a different situation. Many manuals present information in a formal academic way. This can be difficult for health workers to apply in the working situations of district hospitals, health centres and dispensaries.

- Problem Solving

  Very few manuals use a problem solving approach. This means that health workers have to search through a mass of information to find the answer to a particular problem. There are, however, a few manuals which try to help with this problem. A manual of diagnostic flow-charts has been produced (1). Another recent manual has a section of the end of each chapter headed "Caring for a child with .....". Another has an "Index of symptoms" at the back.

- Learning and Teaching

Health workers, and manual writers, often get confused as to whether the information in manuals is to be learned by the reader, or taught directly to his clients by him. This confusion, between the manual as a learning resource for the reader (Health Worker) and teaching resource for the reader's trainer, and the manual as a teaching resource for the reader (Health Worker), can have disastrous effects.
A great part of the Health Worker's job is to pass on information about good health practices to his clients. But few Health Workers are really trained in this. They often end up giving lectures called "health education" that are a mere regurgitation of information from their textbooks or manuals. This is often too difficult for villagers to understand. The difficulties that arise from the problem of communicating with illiterate rural people, the prescriptive and peremptory tone of much of the advice, the complicated nature of much of the advice, often stem directly from the fact that the Health Worker is trying to pass on information directly from his manual, without filtering it through his understanding of the needs and background of his listeners. While this is not only a problem of the manual, it may be one we can help with in the manual.

If the manuals talks about three food groups and balanced diets, can or should the Health Worker try to teach this to mothers in villages? If the manuals talks about socio-economic factors in malnutrition, does it give the Health Worker the right to patronise and advise villagers even if they are his elders and social betters in the eyes of village communities?
One set of manuals (or rather handbooks) prepared in India attems to solve some of these problems. The booklets are based on a list of very simple "rules for better care" (4). They present inforation in the way it can be passed on directly to villagers, as simple questions and answers.

Why do they need the manuals?

As was shown in Chapter 4, health workers either as students in training, or after training when working, need manuals to help them answer questions. These may be questions they ask themselves when they are learning about their job; questions they ask themselves when they are working and want to check up or refer to something to make sure they do it correctly; questions they may have when they come across a problem in their work and think "How can I deal with this"?; or questions they are asked by their 'clients".

Whatever the questions are, different workers will ask different questions in different situations for different reasons. This means they will use their manuals differently. The crucial job for the manual writer, is to try to decide exactly what sort of questions real readers will want to ask in real situations about any task, topic, disease or condition that is to be covered in the manual. He, the writer, must then provide the appropriate answer, and present it so that the reader can find it and use it as easily, accurately and quickly as possible.
The two fundamental questions that the writer has to ask himself, and answer therefore are:

- What questions will these workers have?
- What answers do they need.

Public Health Technicians learning about schistosomiasis in training, for example, will probably have very different questions to clinical officers in the Health centre, checking up about schistosomiasis.

To start with, the manual writer must select the areas his manual is to cover, and break down these areas into a series of questions that health workers are likely to ask. Then he must consider how he will answer these questions. The greater the detail in which the topic is broken down into realistic questions, and the more precise and practical the answers are, the more relevant the content will be. This is not an easy task, and requires close and sensitive contact with real workers or students on the part of the writer.

What should go in the manual?

We can usually break down the information we wish to put into a manual under four different headings:

What the reader needs to know
What he is to do
How to do it
What he is to teach, or pass on to the public.

Some manuals, and not only health manuals, use these as actual headings in the text. This may not always be feasable. It is important though, to assemble the content of a manual in this way, as it helps to ensure the relevance of what goes in.

- What the reader needs to know

  Writers on health worker training and manpower development constantly stress the importance of not overloading health workers with unnecessary and irrelevant knowledge. The use of task analysis is one way of ensuring that this does not happen. The experience of teachers and practicing health workers is also invaluable in making sure you only put in what the readers need to know.

- What he is to do

  For this, the job description of the intended reader is vital. But the official job description is often not enough. Experience of the actual work done in the field is usually necessary to make sure that full details of what is to be done are included.

  Selecting content under this heading is also useful in making sure that operational and administrative procedures are contained in the manual as well as technical procedures. Lack of clarity about operational procedures is one of the common failures both of manuals and of the training of health workers.

- How to do it

  This heading covers the details of the procedures described under 'What he is to do'. It is often useful to split procedures under these two headings, particularly when there are detailed technical procedures to be described.

  These two questions, What is to be done? and How is it to be done? may often require some re-thinking of answers to the first: What needs to be known? You may find that you have included knowledge to be learned that is not justified by the procedures to be carried out; or left out important knowledge.

- What the reader is to teach

  As was pointed out earlier, many manuals fail to distinguish between what the reader needs to know himself and what he is to pass on to his patients, or others in his community. The health worker is in many ways a filter for health information. He needs to understand clearly what, and how, he should pass on to others.

  Thinking about and selecting content under these four headings will help to ensure the relevance of the material both to the level and needs of the worker and to the situation in which he works.

CHAPTER SIX

ACHIEVING USABILITY : HOW SHOULD WE PRESENT THE TEXT

In chapter 2 we mentioned the three main factors that affect usability: structure, language and layout. We mentioned the importance of controlling these factors to suit the readers.

In this chapter we provide some practical guidelines for achieving usability: how to present the text so as to march the needs, skills and purposes of the readers.

Structure

1. When you start to consider the topic you will write on, put it to yourself like this:

   "A Health Worker or student will read, or look up this bit of the manual in order to learn, or find out, or check up, or revise, or teach . . . ".

   The sort of answers you use to complete this sentence should become your headings. They should contain the reader's possible questions. They should be things like:

   "How to ....." or,
   "Why ....." or,
   "What to do for ....." or,
   "When to .....".

   Use these as section headings, rather than formal ones, like "Pathogenesis", "Contraindications", "Aetiology", "Method", etc.

2. Then ask yourself very carefully,

   Who will ask this question?
   Why will they ask it?
   When will they ask it?
   What do they already know?
   What will they do with the answer?

   The answers to these questions will help you decide what to write: how much detail to include; how much background you need to put in; whether to write as instructions, or as descriptions. This really helps you to decide on the structure of the manual.

Headings
---

3. Use the headings you find under 1, above. You may want to add to them to specify what you want the reader to do with the section. You may add things like:
   "You should learn this" or,
   "Check up on this from time to time" or,
   "Follow these instructions carefully" or,
   "Teach this to mothers".

   This will help the reader know what he is supposed to do with the information.

4. Use question headings. People often learn better if they have a question first, that directs them as they read. But if you do put a question heading, make sure the answer is clear. It is usually best to give a simple answer first, then explain it.

5. Where appropriate, use functional rather than formal headings and sub-headings. Rather than "History" use "Ask these questions" (see 1, above).

6. If your manual is for several different sorts of worker, or will be used by different cadres of worker, specify the role of ~~each~~ each worker. For example:

   Control Measures for Bilharzia

   What the Public Health Technician can do
   What the Health Educator can do
   What the Nurse can do

   This helps to particularise general information. It helps readers to apply theoretical information.

Learning
---

7. If you want readers to learn from the manual, try to help them. Try to incorporate some learning strategies or activities in the text. You may need to get help from an educational expert for this.

   Try to show your readers how what they're learning relates to their lives and their jobs. You may try to put some comments like this after each section:

"Think how often you have seen this in your own clinic"
or
"Do you think you can do this now? Try it. Practice"
or
Can you now think of some examples from your own experience like this"?

Teaching

8. If you want readers to teach something in the manual, give them help, or instructions on how to do it. Tell them which parts to teach. Don't assume that they can work out for themselves which part they should teach and which part they should't.

Very few Health Workers are trained to teach, so give them help with it. Tell them when and where to teach something. Tell them who to teach it, and who not to. Tell them how to teach it. Do this for each section.

If you want the readers' trainers to use the manual as part of their teaching, specify this. This may take the form of "Notes for the teaher" at strategic points in the manual, or even a handbook to accompany the manual.

9. Decision making

Much of the work a Health Worker does involves making decisions. Many junior health workers find it difficult to make decisions that involve more than one or two variables at a time. In your manual, try to break things down into simple YES/NO decisions. One way of doing this is to use flow-charts.

10. Make it very clear where the reader has to make a decision. You may like to put in a list of instructions things like:

"Now decide ....."

Make it clear what the criteria are for making the decision. Rather than writing:

"If such-and-such, or such-and-such, or when such-and-such happens . . . ."

it may be more helpful to the reader to put it like this:

"Ask this qustion: such-and-such?
If the answer is YES - Do . . . . .
If the answer if NO - Do . . . . ."

Handle this with great care, however, as it can often get more complicated, rather than less so.

Referencing

11. If you want people to look things up in the manual, to refer to it, make sure it has either an index, or a detailed clear table of contents. Make sure it has a clear, straightforward referencing system. Many Health Workers prefer a simple page numbering system in the index, rather than having each section numbered. If you do number the sections, don't use complicated hierarchial numbering systems like:

2.1
2.1.1
2.1.2
2.1.2(a)

These confuse readers. Use a simple sequential system through the chapter: 2.1, 2.2, 2,3, 2.4.

Don't fill the pages with numbered sub-sections:

2.6
(i) . . . .
(ii) . . . .
(iii) . . . .

or 4.2.3 (a)
(b)

Readers rarely count the numbers, or remember them. A simple indentation or dash is probably all you need. Sometimes, however, students say they like to have things numbered if it helps them to remember. For example:

"There are four main causes of .....
1.
2.
3.
4. ... '

12. Making a good index requires time and skill. But you can make a good index like this:

- Collect 200 blank index cards; or you can tear up sheets of paper to make cards.
- Go through the text from start to finish. Every time you find a reference that you think will need to be in the index, write it on a fresh card or paper with the page number. The same reference will often come on many diffrent cards.
- Now put all your cards, or pieces of paper, into alphabetical order.

- Then transfer all the same references onto one card.
- You now have your index. It simply needs to be typed out.

13. If you want people to refer to your manual to solve problems, make sure that they can find the problems in the index or some sort of problems' list.

For example, a group of Health Workers were asked to refer to a manual for what they should do for a new-born baby with thrush. They were unable to do this since "thrush" did not appear in the index, and was not mentioned under "New-born management". It occured in the section headed "Post Partum Care". This was in the index, but none of the readers, understandably, had thought to look under it.

Think very carefully about what sort of things people might want to look up. Make sure they can.

Language
---

14. Make sure the readability level of your text matches the reading level of your readers. Don't assume that because your readers can speak whatever language your're using, they can read easily in it as well. Testing readability and simplifying language is a specialized job. You may need help with this. Some suggestions are given in Appendix A.

Here are, however, some simple notes that can help you to write simply.

- Try not to have more than 20 words in a sentence.
- Try to use simple sentences with as few clauses as possible.
- Try to use common, familiar words. Do not use synonyms. Use the same word each time.
- Try not to use idiomatic words and phrases.
- Try not to use passives and negatives. Use active, positive sentences.
- Try not to use generalisations. Use personalisations in situations; eg. Rather than: "Dirt in wounds prevents healing" use "If you get dirt into a cut, the cut will not heal".
- Try to avoid participle phrases. These are phrases like: "By washing a wound ....." or "Holding the forceps with your right hand .....".
- Try to put things in the correct time sequence: "Wash the wound after shaving the area" is more complicated than "Shave the area, then wash the wound".

15. It may be necessary to have your text translated. Get help in assing the readability of the translation. Translations very rarely if ever, simplify. Simple translations result from a simple original. Be very careful that your translation isn't in a "high-brow", classical form of the language. In countries where there is a classical and a colloquial form of language, most translators tend to use the classical, which may be much too difficult for the sort of people you are writing for.

16. Try to make your language direct and personal. If you mean the reader to do something say: "You should do this ..." or "Do this ..." not, "This is done .....". The latter, impersonal, passive use, often conceals confusion about who is actually to do something. If you're not sure who should do something, your readers certainly won't be.

Layout
---

17. Following on 7 above, try as far as possible to break the text up into a note-form. Inexperienced readers find long paragraphs and pages of text very difficult. They plough slowly through them, but gain very little. Make imaginative use of spacing, type-faces and layout. You may need specialist help with this.

A Caution: Use of different type-faces and styles (eg. italic, bold, capitals, etc.) is conventional. It does not have intrinsic meaning. Your readers may not be very familiar with these conventions; you may have to point them out, or to teach them.

Considerably more research needs to be done in this area: just what are appropriate layouts for health workers, bearing in mind their overall book-using skills.

18. Use pictures and diagrams to help explain complicated procedures or techniques. But make sure that the pictures are close to the text they refer to. Also make sure your pictures are clear, and mean to your readers the same thing they mean to you. Pre-test them.

19. Try using tables to present information. People often find it easier to locate information in a table rather than in a paragraph of text. They also often find it easier to make decisions from a table than from text.

Finally

At all times, try to think how real readers will actually use the manual in practice. Will it become a door-stop in the out-patients' clinic, a paper-weight on a bookshelf, a certificate of credibility in the health centre library locked away and hoarded, or will it be a useful tool, a real resource, a practical aid to the health worker, student or graduate, in his daily work?

CHAPTER SEVEN

PUBLISHING A MANUAL

Publishing a manualis taken here to mean the complete series of operational steps from planning the manual (Chapter 4) up to distributing copies to the intended readers. This can be done in very many different ways, depending on the size of the manual and the number of copies needed, and the printing resoures available.

In general, three main operational areas need to be considered in producing manuals:

- Writing and editorial work
- Prodution and manufacture
- Promotion and distribution

Manuals start as ideas and needs, identified overall in reviews and design of training, or arising from particular shortages and demands. These ideas and needs must then be translated into coherent plans for specific materials and books.

The first stage, therefore, is the writing and editorial stage; this is often the most draw-out and crucial stage in producing effective manuals. One important consideration regarding this stage is its cost, particularly if workshops are held or authors are scattered around the world and have to be consulted at various stages in the editing process. It is estimated that some 50% of the cost of producing manuals is may be used at this stage. It seldom takes less than a year, and may often be up to four or five years or even longer.

The next major step involves turning the final typed manuscript into a printed book. There are two main types of activity in this step: production, or preparation, of the material, and the actual printing.

The dividing line between the two stages, production (copy editing, specification, typesetting, proof-reading, layout) and printing (deciding on and buying paper, imposition, filming, plate making, printing, folding, collating and binding) is sometimes difficult to define because several of these steps may take place at the same time. The aim, however, is to ensure the accuracy and consistency of every sentence in the book and to make the whole thing easy to use and read, practical, attractive, and long lasting. Production and printing are estimated to make up about 33% of the cost of a book. These stages also require a great deal of time, usually taking between a year and two years depending on the length ad complexity of the book.

The final stage, the promotion and distribution of the book or material, is often ignored by non-professional producers of books. Yes it is of crucial importance, as the prime reason for producing the material is to get it into the hands of the health workers who need it. This stage also involves considerable expense in establishing a storage and distribution system. Books are bulky and their storage and distribution is relatively expensive. In addition, books in storage represent a considerable amount of money.

Whatever system is used to produce a book, the basic process outlined above is the same. The aim in this booklet is not, however, to provide a complete guide to all the complexities of this process. Some notes on the simple, small-scale produce of material can be found in Abbatt "Teaching for Better Learning" (1). An extremely detailed guide to the organizational and management aspets of preparation, production and distribution of textbooks has been prepared by UNESCO: "Educational Development - A practical issue: Guidelines for the preparation, production and distribution of textbooks" (2). A similar detailed analysis of large scale production of books is in the World Bank paper: "Publishing for Schools: Textbooks and the less Developed Countries" (3).

What will be done in the rest of the chapter is to outline the experience of the African Medical and Research Foundation in the medium scale production of textbooks. AMREF has its own printing department and distribution unit, and produces about 40,000 copies of its books a year. Its experience is therefore a useful guideline for those thinking of entering the book production business on a medium scale. There follows a checklist of activities for producing books, deriving from our experience.

Writing and general editing:

1. Subject proposal

A number of things need to be established at this stage.

- Audience: Who? How many?
- Content: relevance, level, design, etc.
- Use/Nature of book
- Language
- Author
- Fuding

Of main importance in this stage is to establish the relevance and usability of the material to be produced; how it will be produced, by whom and in what sort of numbers and design; and what resources are needed for this.

2. First draft

This rfers to the original manusript to be produced. It may be a single author, or a collaborative effort of a team or collection of writers.

Activities involved are:

- Writing
- Typing and duplicating as a first draft
- Pictures (to be considered/produced at this stage)

3. Workshop

It is essential that a book be acceptable to those who will have to use it; not only the actual raders, but also their trainers and supervisors and policy makers. It has been found very useful to hold a short workshop with representatives of thee groups to introduce the first draft and to allow corrections, changes of emphasis, and establishing of policy decisions.

Preliminay testing of, for example, readability, may also be done at this stage. The main points to establish therefore are:

- Technical content correct?
- Technical content appropriate and relevant?
- Acceptable?
- Readable?

4. Author's revision/editing

At this point the author may himself revise and edit the book, or it may go to an editor who takes over. Either way certain things have to be considered:

- revisions from workshop incorporated
- appropriate presentation established: language level (readability); teaching/leaning struture; design/structure of content
- referencing system established: page/section numbering
- design for pre-testing (if necessary)

Much of this editing relates to ensuring usability: getting the presentation of the book right.

5. Selecting illustrations

This can be a problem. The main points to consider are:

- find appropriate illustrations, or
- author draws them, or
- commission an artist.

At this point the style of the illustrations needs to be carefully established: photos/line drawings/cartoons, etc.

6. Pre-testing

If the book is to be pre-tested, this is usually the best stage. Separate parts can be pre-tested before the final draft is prepared Pre-tests can cover:

- readability
- pictures
- learning.

7. Final draft/experimental edition

At this point it is possible to put together a final draft. This may go directly to production or it may be duplicated as an experimental edition. An experimental edition is often useful as it can reach a wider audience than the earlier workshop. It may, however, hold up the production of the book while you wait for comments and reactions. If you produce an experimental edition you will have to consider the next activity.

8. Re-edit experimental edition

- incorporate comments
- re-type.

Production

9. Copy-editing

This is the painstaking job of getting a typescript ready for typesetting. It involves these main activities:

- Editing for consistency and accuracy of language use/spelling/word emphasis/punctuation/heading, etc.
- Producing and checking the front and end pages: Foreword/introduction/acknowledgements/appendices, index etc.
- Deciding on positions and style of illustrations/tables, etc.
- Technical content editing (if necessary).

10. Specification

This involves specifying how the manuscript is to be typeset.. It covers these things:

- page size/line length/texttype face and size/layout/illustrations/justification, etc.
- design of headings, etc.
- preparing paste-up grid sheets
- covr design.

11. Typesetting

The specified text is now typeset. 1 original and 2 copies (proofs) of the galleys should be produced.

12. Proof-reading

- author's proof-reading
- copy editor's proof-reading
- corrections made and typeset.

13. Dummy

A copy of 11 is used to prepared dummy layout.

14. Extras

The index cannot usually be made until this point as the actual page numbers from the dummy are needed. The index is then typeset and proof-read.

5. Final Paste-up

The original from 11 is now pasted-up to make camera-ready copy. It needs to be carefully checked, especially for pagination. The original illustrations are pasted in position at this point.

Printing

6. Preliminaries

- Selection of printing process/number of copies/binding, etc.
- Imposition system
- Costing

17. Making Negatives

The first stage of actual printing is making negatives from the final paste-up (15 above). This can also involve:

- 'Stripping-in' of illustrations and half-tones.
- Retouching, to remove unwanted lines, blemishes etc from the negative.

18. Plate making

When finally ready, the negatives are exposed directly onto the printing plate. The resulting metal plates are then passed to the machine for printing.

19. Making ready the machine and printing

The machine is 'made-ready' or prepared with correct paper,, ink, and the plate from 18 above. The first proofs are checked for position and overall printed quality. Te number of copies needed is then run.

20. Folding and collating

Pages of a manual are usually printed eight or more at a time (depending on the press being used) on a large sheet of paper. This large sheet is then folded so that the pages appear in the right order. A manual may consist of many such 'sections'. All these sections are then 'collated' (put in correct order) and put together to form the complete book.

21. Binding

Th cover is put on, and stitched or glued.

22. Finishing

The whole book is trimmed to the correct size and checked to see that all the pages are there, and all the right way up, in the right order, etc.

Distribution

As was mentioned earlier, distribution of books is an important part in the publishing process. In essence, distribution means making the right books available to the right people at the right time and place, and at a price they can afford. There are three main areas of concern: the target audience; the channels of distribution and the practical problems of ordering, payment and shipping.

- Target Audience

  - who are you trying to provide with books?
    (students, teachers, health workers)

  - where are they?
    (training schools, health institutions).

  - how many are they?
    (now and in the future, by cadre)

  - which books do they need?
    (curriculum, book choice, price)

  - how many books do they need?
    (library reference, student loan, student issue)

- Distribution Channels

  - which books are already available from publishers?
    (choice of titles for each topic)

  - physical distribution routes from publisher to reader?
    (publisher, wholesale bookseller, retail bookseller, training school store, direct supply)

  - who chooses which books to supply to readers?
    (reader, teacher, Ministry of Health)

  - who pays for the books?
    (reader, school, Ministry of Health, donor)

- Practical Problems

  - what are the formal procedures to make an order?
    (request authorisation, budget, important permits)

  - how much time will it take to deliver the books?
    (immediate, one month, six months)

  - how should books be packaged?
    (1 kg, 1 ton, 10 tons, 100 tons)

  - how much money will it cost to deliver the books?
    (freight, storage, communications)

Deciding on ansewrs to these questions will depend very much on the situations and you are in, the regulations that apply, and the resources available.

Appendix A: Testing Readability : Cloze Tests

A simple method to test the readability of a manual with reference to a particular group of health workers in the cloze procedure.

This is a useful method, as it is so simple, easy to use and reliable. It is also very versatile.

The cloze procedure measures readability, that is, the reading difficulties inherent in a text, for any given reader or group of readers. It does not directly measure comprehension, though it correlates highly with other tests of comprehension, and has been used as a measure of comprehension (1, 2).

Readability is only one of the factors that influence reading ability or reading skills. Yet it is a fundamental one. It relates to the reader's language ability and familiarity. Factors such as familiarity with content and/or technical terms, fluency in the spoken language, or aptitude in study skills, are of secondary importance compared with the ability to decode written language. If the reader cannot decode the language, he has little hope of doing anything with a text, apart from "barking at print": the recognition and reproduction of meaningless sound-symbol relationships.

This procedure, known asa 'cloze test' by whicha passage is mutilatedby having every "n th" word withdrawn, was introduced by Taylor with native speakers in 1953 (3). It has since been widely used and validated for both native and second or foreign language speakers, with many languages and many kinds of subjects. Oller has used it extensively with second language learners (1, 4), Klare has used it for training materials and translations (5), and recently it has been used very effectively to survey reading skills and texts in Government Schools in Botswana.

Once a passage has been mutilated, subjects are asked to replace the missing words. The numberof correct words replaced gives the readability score. The "correct" words replaced may be either those which were originally removed, or any acceptable alternative within the constraints of meaning, grammar and context. "n" (how often words are left out) has been found to be optimal for test purposes between 5 and 10 in English. Figure 1 gives an example of a cloze test. Note that in this tet n = 6, and there are 33 blanks. It is usually best to try to make the test on a passage of conneted prose about 250 - 300 words long.

Leave two or three sentences at the beginning of the passage as an introduction then simply start counting the words up to n. At

n, leave a blank, then count another n words, leave another blank, and so on. Count figures and numbers as single words. Leave a sentence or two at the end as a fade-out. You can present the text in various different ways. One way is as in the figure. Another way is simply to leave the blanks where they occur in the text and let the subjects write their answers there. It does not seem to make much difference whichever way you present it.

Figure 1

4.2 IMMUNITY AND ANTIBODIES

A child only gets whooping cough once. He does not get whooping cough again because he is immune to it. He becomes immune by making antibodies.

Antibodies are special protein in ___1___ blood. Antibodies 'fight' the organisms ___2___ cause disease, or the toxins (___3___) that organisms make. Antibodies fix ___4___ an organism and kill it. ___5___ can also fix onto toxins ___6___ stop them causing harm. The ___7___ which fight toxins are called ___8___ . So an antitoxin is a ___9___ kind of antibody. A different ___10___ of antibody fights each organism ___11___ toxin. For example, measles antibodies ___12___ fight measles virus. They ___13___ fight malaria. Antitoxins against tetanus ___14___ not helpful in diphtheria. The ___15___ cells in the blood are ___16___ important for immunity, but we ___17___ describe antibodies here.

While a ___18___ is ill with measles ~~he~~ his ___19___ begins to make the special ___20___ against the measles virus. He ___21___ on making measles antibody for ___22___ rest of life. He ___23___ immune, and never has measles ___24___ . When a child makes his ___25___ antibodies, he has an active ___26___ . He can become actively immune ___27___ two ways. He can become ___28___ with the disease itself, or ___29___ can give him a vaccine. ___30___ we give a child a ___31___ , he makes antibodies against the ___32___ or harmless organisms of the ___33___ .

He has no symptoms, or ___34___ mild symptoms, such as a mild fever. The antibodies which he makes can fight the harmful organisms of that disease, and so prevent him becoming ill.

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Assessing scores of cloze tests is usually done on a 3 level scale:

- Under 45%: frustration level
  The reader can decode parts of the text but cannot grasp its complete meaning.
- 45% to 60% : instructional level
  The reader can cope with the text if some instructional help is give.
- Above 60%: fluency level. The reader can read the text.

When assessing cloze test scores it is importantto remember that they measure readability, not necessarily comprehension, though the two are closeyl linked. Thus a subject whofalls at the frustration level may well be ableto guess at the general sense of the passage. If there are pictures or other clues, or he is very familiar with the content, he may well be able to guess quite accurately what is in the passage. But he cannot read it. He cannot decode sufficient words in the passage and link them to each other syntactically and semantically to be sure of what is meant by the passage. At the instructional level a reader has more idea of what the passage is actually saying, but there are still major gaps in his decoding and interpreting. These are sufficiently few however, that with some sort of help, like a labelled diagram or a picture, or instruction from a teacher on the passage or its contents, he can read it well enough to grasp the meaning intended. Since the point of manuals is to provide important information which the user must have access to on his own, by reading his manual, it is very important that radability scores fall in the fluency level. At the instructional level, manuals are useless to readers without the help of a teacher.

Perhaps the most useful aspect of cloze tests in their use as comparative instruments, to show the difference in readability of one textfor different groups. Thus a manual produced for several different cadres of worker must take into consideration varying reading levels of different groups.

It is important to note that readability scores indicate the interation of a reader and a particular text. They do not, per se, indicate anything about that readers' grasp of language, or reading skills in general. Thus, the fact that a group of workers may fall mainly at frustration level in a cloze test does not mean that they cannot read English. It does, however, mean that that text is too difficult for them to read. They might cope easily with a simplified version of the text, where language, not content is simplified.

Indeed, tests carried out with health workers in several countries indicate clearly that linguistic simplification of a text can be carried out without tampering with the content, and that significant increases is readability result.

Appendix B : Using books for teaching and learning : some sugestions

Books do very little good if they just sit on a shelf. In order to serve as a learning tool, books must be used. Many people have asked us for suggestions on how to use books more effectively. In this section, then, some suggestions are offered in two areas:

- ways that teachers can use books in their teaching;
- ways that teachers can train their students to use books more effectively.

For Teachers

- Use books in the classroom.

  Reading is a very good way of learning information. It is much better to read a lot of techical content than to have a lecture on it. Students can work at their own pace when reading. Give people enough time for reading. If you have a mixed group of students, you may find it better to read round the class than for everyone to read by themselves. Always allow clasroom time for reading. Very few people will want to read on their own in the evenings. The ones who do are usually the ones who do not need to, as they are more keen to learn than the others. You can ask students to buy their own books, so that everyone has one, or take out a classroom set of books from the library.

  Make references to books.

  Instead of giving a lecture on a topic, tell your students to read about the topic in books in the library. Give them the references to the books and also to the pages or sections they should read. You can then discuss in class what they have read.

  At first you may find that students are unaccustomed to this sort of learning. They may complain or ask for a lecture instead of the reading assignment. But if you insist on their reading, they will benefit. It helps to train them in skills of learning and searching for information. These skills are some of the most important that they can develop and will help them to continue learning on their own after they have left the classroom.

- Use books for problem-solving.

  Give the students a problem. Tell them to find the solution to the problem in their books. Then let them discuss in class the solutions they have found. The problem you give the students could be like this:

  A primagravida comes to your health centre in the end of the first stage of labour with a breech presentation. What things may go wrong in the delivery? What should you do?

- Teach students how to use books more effectively.

  The next section gives some hints on this.

For students

There are three very important skills for students to acquire in using books:

- how to use anindex
- how to ary their reading speed for diffrent purpos of reading
- how to use a book to solve problems

Like any other skills, skills in using a book require practice. Classroom time devoted to learning and practicing these skills is time well spent; for after the student leaves the classroom, books and other reading materials will be his or her principal source of continuing education.

- Teach your students how to use an index.

  Many students will not be familiar with an index. Take five minutes at the beginning of each session for a week. Write a word on the board (like virus, diarrhoea, breech presentation), and ask the students to look it up in the index. Then they should turn to the page on which that word is discussed and see what it says on that page. Discuss difficulties that come up. For example, you may ask them to look up heart. If they can't find 'heart' in the index, suggest they look for other words related to 'heart,' like 'cardiovascular.'

  Continue daily practice with the index until the students feel confident using an index. Then check them periodically throughout the course.

o Teach your students how to vary their reading speed

We all read at different speeds, depending on what we are reading and why. If something is very complicated or very important, we usually read it slowly, to make sure we do not miss anything. If we are trying to find something -- for instance a reference we want to check in a book -- we skim quickly throug, not taking much notice of everything else that is there. The most important thing about reading for learning is to be able to choose the best speed at which to read something and to be able to deliberately control our reading speed.

There are two main ways of reading: receptive/reflective reading and skim/scan reading. Each requires a different reading speed. Train your students to choose the right type of reading for the purpose.

- Receptive/reflective reading

This means reading slowly through something, and gathering as much information from it as we can. We often need to stop to think about what we are reading. We may want to go back a little from time to time, to check something we read earlier, or just pause for a few moments to think about what we've read.

- Skim/scan reading

This means skipping through something very fast, to get a rough idea of what it is about and whether we want to read it carefully or not. We also use this type of reading to go through something we have seen before and see if a particular item is there or find a piece of information that we know is there. Skim/scan reading is a fast style of reading.

Every time we read anything, we need to choose the best style of reading. Otherwise we waste a lot of time and often do not learn easily. Try to train your students to vary their reading speds. Give them small exercises to do. For example, ask them to read something and then answer questions. Or ask them to skim quickly through a passage in a book to find a particular item of information.

Teach your students to use booksto solve problems.

Students should learn that books are rsources, like teachers or colleagues. You can ask qustions of books just as you ask questions of teachers or classmates.

Practice this in the classroom. When a student asks a question, suggest that the class all try to find the answer, then and there, in their books.

Help the students to see that books are very useful in thse ways:

- for getting information to help them solve problems;
- for reference, to check things like doses and procedures; then they do not need to memorize these things but can simply look them up in their books as needed.
- for learning from, at their own pace, when there is something they did not fully understand in class.

Many of these ideas about books will be unfamilar to your students. At first they may reject them. But try to encourage them to use books in the way we have suggested. It will help them to learn and will also make your work as a teacher easier in the long run.

Learning to use books effectively, then, is one of the mostimporta nt skills a student can acquire. The student who cannot use a book will learn only while he is in the course, and he may not even learn very well then. But the student who has developed skills in using books can continue to learn for the rest of his life, long after his basic training is over.

Appendix C: Notes on Needs Assesment for books

Details of making a needs assessment about books for health workers are best left to be worked out for particular situations. The WHO report of a group meeting on the Health Learning Materials Programme held in Alexandria in February 1976 suggests some guidelines.

In this appendix we will simply suggest some broad considerations for needs assessment. Assessment will cover six main areas:

- Numbers and levels of health workers for whom books are needed. This will include students in training, in-service health workers, trainers, and future enrollments and expansions.
- Subjects/topics/jobs for which books are needed. This will require detailed analysis of curricula, job-descriptions and working conditions.
- Relevance and Usability studies, to ascertain what the needs of the health workers are and what reading skills they possess.

- Identificaion of existing books, and priority gaps. This must be done on the basis of the first three assessments.
- Costing of various approaches: eg. buying books, producing them locally, where and how written, etc.
- Priority setting on the basis of all the above.

For example, to see how some of these considerations are important, let us examine a fictional country.

EXAMPLE

It has five main cadres of workrs who need books. There are 30 training schools for these workers each with an approximate enrolment of 30 students per year. Analysis of their curricula show that each cadre needs an average of 8 textbooks for their course. (Note, these are not unreasonable figures for a medium sized country).

The rough estimate of books needed for these workers is:

30 x 30 x 8 (schools x students x books)
= 7200 books

If the average price of a book is US$ 8.00, the investment in books is $57,000.

This figure does not take into account

- health workers already in the field
- changes in student enrolment.

This figure does not tell us how the books are to be used. If every student is expected to own the 8 books, to keep after raining for reference and on the job help, the figure is $57,000 er year. This money will either have to be found by the training institutions, or by the students themselves.

his figure also does not take into account existing books in chool libraries and students' possession. These are likely to be far fewer than is generally expected.

DECISIONS

n the basis of these figures, the country planners can now make a number of decisions:

- Whether they can afford to buy the needed books, considering foreign exchange situations, the rising cost of books etc.
- Whether they can invest in loal production, and hope to reduce the cost per book to lower the overall figure.

- What existing books can be used, and what prioities can be set, using their available resources, either for buying or producing.
- What policy on student use they will adopt: free distribution to every student to keep; distribution to classs of students to be returned at the end of the year or course; expanding library facilities to make fewer copies of the books go round better; expecting students to buy their own books; etc.
- What other alternatives there are: re-printing other books, looking for grants, using other forms of teaching material;
- Training book producrs, writers, printers etc.
- Expenditure involved in the mars storage and distribution of books.

These are some of the considerations that need to be taken into account in making a needs assessment, and in using it to plan a health learning materials programme.

Appendix D : A short annotated bibliography

Balcomb, John. 1975 — 'Communication for development: From propaganda to dialogue', Educational Broadcasting International, March.

A short article broadly outlining some of the problems in the use of communication media in developing countries. The author is primarily interested in the use of radio, TV and Drama as a means of establishing a dialogue between consumers and senders of messages, meaningful in the consumers' frame of reference.

Beeby, C.E. 1966 — 'The quality of Education in Developing Countries', Harvard University Press.

Mainly of interest for the author's analysis of 'educational stages': how the level of the teacher, in terms of his training in teaching and his knowledge about the subject, determine the kinds of teaching he can do. Important for anyone writing teaching or learing materials.

Coombs, Philip 1968 — The World Educaion Crisis, A Systems Approach, O.U.P.

Excellent basic description of the crisis in education today, and of the systems approach to education.

Coppen, Helen. 1970 — 'Visual Perception', Commonwealth Secretariat.

This is a short review of the literature on cultural problems with pictures, diarams, charts, poster.
It summarizes general findings and provides guidelines for the use of visual material particularly in teaching. The literature reviewed is mainly concerned with studies carried out in Africa. Important for anyone working with visuals.

Court, D & Ghai D. 1974 — Education, Society and Development, O.U.P.

A collection of research papers on the Kenya education system. Excellent for identifying some of the basic problems and factors in education systems in developing countries.

Criper, C. & Widdowson, H.G. 1975 'Sociolinguisics and Language Teaching', in Papers in Applied Linguistics, Vol.2 of The Edinburgh Course in Applied Liguistics, ed. J. P. B. Allen & S. Pit Corder, Oxford University Press.

A thorough introduction to sociolinguitics for anyone interested in looking in more detail at the variable and functional nature of language. Particularly useful for anyone interested in kinds of language used in manuals and how to match this to the language used by workers.

Cripwell, K.R. 1971 'Governmental writers and African Readers in Rhodesia', Language Society, 4, Gt. Britain.

A description of some of the factors that cause complexity in language, and how manipulation of these factors can produce texts at very different levels of complexity. Very useful for anyone concerned with simplification of language.

Cripwell, K.R. 1976 'What is a Cloze Test, and how do I use it', Modern Englishi Teacher, Vol. No. 7.

A simple introduction to the Cloze procedure: how to make a cloze test, how to use it, what it does, why it is useful. Important for anyone starting to use cloze tests for readability.

Dow, Gyneth 1979 Larning to Teach: Teaching to Learn; Routledge & Kegan Paul, London.

An excellent book describing an innovative teacher training programme at Melbourne University. Has some fundamental things to say about teacher training.

Fuglesang, A. 1973 'Applid Communication in Developing Countries', Hammarskjold Foundation.

A classic on the problems that may arise when using written material or pictures with villagers in developing countries. Particularly interesting for the author's suggestions about alternative ways of presenting pictures. Basic reading for anyone concerned with producing communication material for use with villagrs.

Gagne, Robert M.
1977 (Third Edition)

The Conditions of learning, Holt, Rinehart and Winston.

A baic text on the Psychology of learning. Complicated and detailed, but a fundamental text.

Giglioli, Pier Paolo.
1972

'Language and Social Context' ed., Penguin Modern Sociology Readings, Penguin Education.

A collection of readings by the great names in sociolinguistics, Hymes, Searle, Bernstein, Gumperz, Labov etc. Fairly technical and fairly detailed. Only useful for someone interested in looking in some detail at the social uses and meanings of language.

Gilliland, John.
1972

'Readability', a United Kingdom Reading Association Teaching of Reading Monograph, Unibooks, Hodder and Stoughton.

A discussion of what readability is; a clear summary of the research that has been done on things like legibility of print, factors affecting readability, and methods of assessing readability. The author does not cover, however, more recent or detailed discussions of what 'reading` is. Useful for anyone looking in some detail at readability.

Hartley, J. &
Burnhill, P.
1977

'Fifty Guidelines for Improving Instructional Tet`, Programmed Learning and Educational Technology, Vol. 4, No. 1, February.

More in the way of a check-list of potential problems. Largely concerned with the physical design of texts, though with some hints about readability. Most useful, perhaps, to check for ideas while writing a manual.

Holmes, Alan C.
1963

'A study of understanding of visual symbols in Kenya`, OVAC publ. no. 10, Overseas Visual Aids Centre, 31 Tavistock Square, London W.C.1.

A small, early study of some of the difficulties villagers have in understanding pictures which to us are quite clear. Confined to Kenya, but useful to anyone interested in using pictures with villagers, as a starting point.

International Extention College 1978.

'Writing for Distance Education`, draft.

This is the first draft of a manual for writers of distance teaching texts. It contains a lot of very useful material, exercises and examples, based on wide experience, mainly in Africa, of producing material for extension education colleges. Especially useful for educational factors for anyone writing learning material.

Jenkins, Janet. 1976

'Editing Distance Teaching Texts`, International Extention College Broadsheets on Distance Learning, No.9.

This 'handbook for those involved in preparing printed course material`, is concerned mainly with the details and technicalities of editing and setting out printed mateial. Useful if you have to do this sort of editing and physical design yourself.

Jones, Sheila. 1968

'Design of Instruction`, Training Information Paper No. 1, Dept. of Employment and Productivity, HMSO.

This booklet reports some of the basic research in the efects of negatives, sequencing, complexity in instructions. Very useful for anyone looking closely at the writing of instructions.

Lesotho Distance Teaching Centre

'Understanding Print: A survey in rural Lesotho of people's ability to understand text and illustrations`, Lesotho Distance Teaching Centre, P O Box MS 781, Maseru, Lesotho.

This detailed study looked at rural people's abilities to handle such things as photos, diagrams, maps, enlargements, texts, photo-strips radio listening, arithmetic. It gives a clear picture of the sort of problems that can arise with the use of these materials. Important and stimulating material for anyone producing material, or testing it.

ınzer, Eric &
ırdner, Keith

The Effective Use of Reading, Heinemann Educ. Books

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Teaching & Learning, UNESCO & the International Asociation of Universities.

Although talking about higher eduation, contains some very useful ideas on teachig methods, materials and technologies. Summarizes much of t he research on alternatives.

Oller, J.W.
1972

'Scoring Methods and Difficulty Levels for Coze Tests of Proficiency in English as Second Language', Modern Language Journal, Vol. 56, March.

A fairly detailed account of experiments to measure some of the variables operating in Cloze tests, in different languages and on native and non-native performers. Stimulating for anyone looking more closely at Cloze tests and how they can be used. Fairly technical.

Oller, J.W.
1973

'Cloze Tsts of Second Language Learning Proficiency and What they Measure', Language Learning, 23, 1.

A technical description of Cloze tests, also looking at their use with pitures and translations. Stimulating or anyone working closely with cloze tests.

Saunders, D.J.
1974

'Visual Communication Handbook', Lutterworth Press, Guildford and London.

A straightforward approach to some of the problems of visual communication, and the basic techniques of such communication. Simple descriptions of how to make materials and how to use the most common media: flip charts, posters, film-strips, projectors. Useful for anyone engaged in the production or use of simple visual communication materials.

Serpell, Robert.
1975

'Culture's Influence on Behaviour', Essential Psychology series ed. Peter Herriot, Methuen.

An up-to-date acount of cross-cultural psychology. The author reports on extensive experiences and experiments with cross-cultural problems of psychology and perception in developing countries, mainly in Africa. Useful for anyone concerned with producing material to be used in different cultures.

Sinaiko, H.W.
1975

'Verbal factors in human engineering: some cultural and psychological data', Chapter 10, Ethnic Variables in Human Factors, ed. A. Chapanis, Johns Hopkins Press.

A stimulating account of a series of tests and experiments, largely focused on tanslation, visual perception and learning, carried out in Viet Nam. Useful reading for anyone producing material for translation, and interested in cross-cultural perception.

Srivastava, R.N. et al
1978

Evaluating Communicability in Village Setings, Parts 1 & 2. Available from UNICEF, New Delhi or Dept. of Linguistics, University of Delhi.

A report on the evaluation of the communicability and comprehensibility of the Indian Community Health Workers Manual. Contains some fundamental descriptions of "verbal repertoire' in villages and its teaching/learning implications.

Stenhouse, Lawrence
1975

An Introduction to Curriculum Research and Devlopment, Heinemann, London.

An excellent discussion of new trends in curriculum development; includes a critique of the objectives model and suggests an alternative - the process model.

Taylor, W.L.
1953

'Cloze Procedure: A New Tool for Measuring Readability', Journalism Quarterly, Autumn.

One of the first descriptions of cloze tests, different ways of constructing them, and what they may measure. A classic for anyone using cloze tests. Not too technical.

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, R.N.

'The Graphics of Communication',
Holt, Reinhart and Winston.

book covers the whole range of visuals and graphics as used
ooks, papers and magazines. A useful summary of guidelins for
bility and visibility of print. Stimulating for anyone
rested in the visual impact and effect of materials. Useful
for its descriptions of printing methods.

EF & NDS, Nepal

'Communicating with Pictures in
Nepal', Report of a study by NDS
and UNICEF, Kathmadu.

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recognisable by villagers. It also touches on the use of
our. Stimulating for anyone working with pictures.

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'Numbering Systems in Text',
Textual Communication Research
Group, Institute of Educational
Technology, The Open Univrsity,
Milton Keynes, England.

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se. Unfortunately little hard research data seems to
ailble on this. Important for anyone interested in texts which
quire referencing or numbering.

ight, Patricia
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'Presenting Technical Information:
A Survey of Research Finding',
Instructional Science, 6.

is article examines much of the research done recently
presentation of information and looks at the implications of
is research for practical application in preparing
formational material. It looks at things like different ways of
king tables, choosing between prose, tables of flow chats,
fferent styles of prose. It also discusses the
terrelationship of research and actual testing of material in
ne field. Together with several other articles by the author, it
s very useful for anyone concerned with the effective
esentation of information.

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Appendix A : Testing Readability : Cloze Tests

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