Designing Instructional Text

Third Edition

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Preface to the third edition

Designing Instructional Text is intended to give general guidelines for the producers of instructional materials. These guidelines are based upon current practice and upon a critical reading of relevant research.

The notion of planning the layout of such text in advance is emphasized throughout the book. This is done for two reasons. First, instructional text is usually more complex in its structure and appearance than is continuous prose – and thus it requires greater thought about its presentation. Second, technical advances in print and publishing mean that more and more non-specialists are now involved. Planning can help such people to be more effective.

Many people producing instructional materials today use computer-aided means to do so. However, the aims of the first five chapters in the book are to outline the relevant thinking behind earlier traditional typographic tools and skills, in order that these can be translated into modern practice.

Basically this book discusses three main issues: the design and layout of instructional materials, the language in which they are written, and how to evaluate the finished product. Each issue is important: by considering them in combination more effective text will be produced.

Acknowledgements

Many people have helped in the preparation of *Designing Instructional Text*, and although I can thank them here, it is impossible to name them all.

However, I can mention some. Peter Burnhill was responsible for the initial design of the first two editions of this text, and he has given me invaluable advice throughout. John Morin and John Coleman prepared much of the artwork. Doreen Waters helped Margaret Woodward to word-process the text. Helen Carley of Kogan Page urged me on. I am very grateful to these people and to the many others who have helped in one way or another with the production of this text.

James Hartley

1 Choosing a page-size

This chapter considers how choosing an appropriate page-size for a book or document determines subsequent decisions about the detailed planning of the work. Here I discuss the advantages and limitations of choosing a page-size from the range of standard sizes recommended by the International Organization for Standardization.

Printed materials come in many shapes and sizes. Until recently there have been no specific rules or guidelines which might suggest to writers, designers or printers why they should choose one page-size in preference to any other. The research literature on legibility and textbook design offers little help, for page-size is not an issue that features in many textbooks on typographic research. Why then do I choose to open my guide to designing instructional text by discussing page sizes?

Many people expect a review of typographic design to begin with issues such as type-sizes, type-faces and line-lengths. Indeed, the first question that an editor of a forthcoming journal once asked me was, 'What type-size should I use?' However, it is important to realize that the choice for this variable is already constrained by earlier decisions. Clearly we do not expect to find large type-sizes in a pocket dictionary nor a single column of print in a daily newspaper. These examples are extreme, but they illustrate the point. The choice of page-size comes first, and this affects the choices that are available for subsequent decisions.

The size of the page (and these days, the electronic screen) determines the size of the overall visual display. The reader needs to be able to scan and read this display easily, be it large like a wall chart, or small like a pocket timetable. The reader needs to be able to scan, read and focus on both the gross and the fine details. The size of the page or screen constrains the decisions that writers and designers make about these details.

The choice of an appropriate page-size is not always easy. A number of factors contribute to decisions about which page-size to use. Perhaps the most important one is some knowledge of how the information is going to be used. Other factors are reader preferences, the costs of production and marketing, basic paper sheet sizes and, more generally, the need to conserve resources and avoid waste.

Standard page-sizes

In the case of printed texts, one of the most obvious things that can be wasted is the paper itself. It is for this reason that there is great interest in

manufacturing *standard* page-sizes, and the International Organization for Standardization has achieved an intriguing solution to this problem.

The page-sizes that we commonly see are cut from much larger basic sheets which have been folded several times. The present-day variety in page-sizes results from manufacturers using different sizes for their basic printing sheets and folding them in different ways. If the basic printing sheets were all one standard size, however, and the method of folding them allowed for little if any wastage at the cutting stage, then great economies could be achieved.

As an aside we may note that the need to rationalize paper sizes has been discussed for a long time in information printing. In 1798, for example, the French government prescribed a standard for official documents based on the proportion of 1:1.41 with a basic printing sheet of one square metre in area. In 1911, Wilhelm Oswald proposed 1:1.414 (that is, $1:\sqrt{2}$) as the 'world format'. In 1922 the German standard, DIN 476, was published. For this standard the ratio of $1:\sqrt{2}$ was retained with a basic printing sheet size of one square metre. The German standard, together with the A, B and C series of sizes, was adopted in 1958 by the International Organization for Standardization (ISO). Today the ISO series is recommended by the 50 or more national standards bodies which together make up the ISO.

The dimensions of the sizes in the ISO A and B series of sizes are set out below. The C series relates to envelope sizes for use with standard-sized documents and need not concern us here. In the United Kingdom the A series is now well known, especially the more commonly used A4 and A5 sizes. The B series, which is rooted in the same principle as the A series, and whose sizes fall in between those of the A series is, however, not so common.

ISO series of trimmed paper sizes:

A series		B series	
Designation	Size (mm)	Designation	Size (mm)
A0	841 x 1189	B0	1000 x 1414
A1	594 x 841	B1	707 x 1000
A2	420 x 594	B2	500 x 707
A3	297 x 420	B3	353 x 500
A4	210 x 297	B4	250 x 353
A5	148 x 210	B5	176 x 250
A6	105 x 148	B6	125 x 176
A7	74 x 105	B7	88 x 125
A8	52 x 74	B8	62 x 88
A9	37 x 52	B9	44 x 62
A10	26 x 37	B10	31 x 44

The unifying principle of the ISO-recommended range of sizes is that a rectangle with sides in the ratio of $1:\sqrt{2}$ can be halved or doubled to produce a series of rectangles *each of which will retain the proportions*

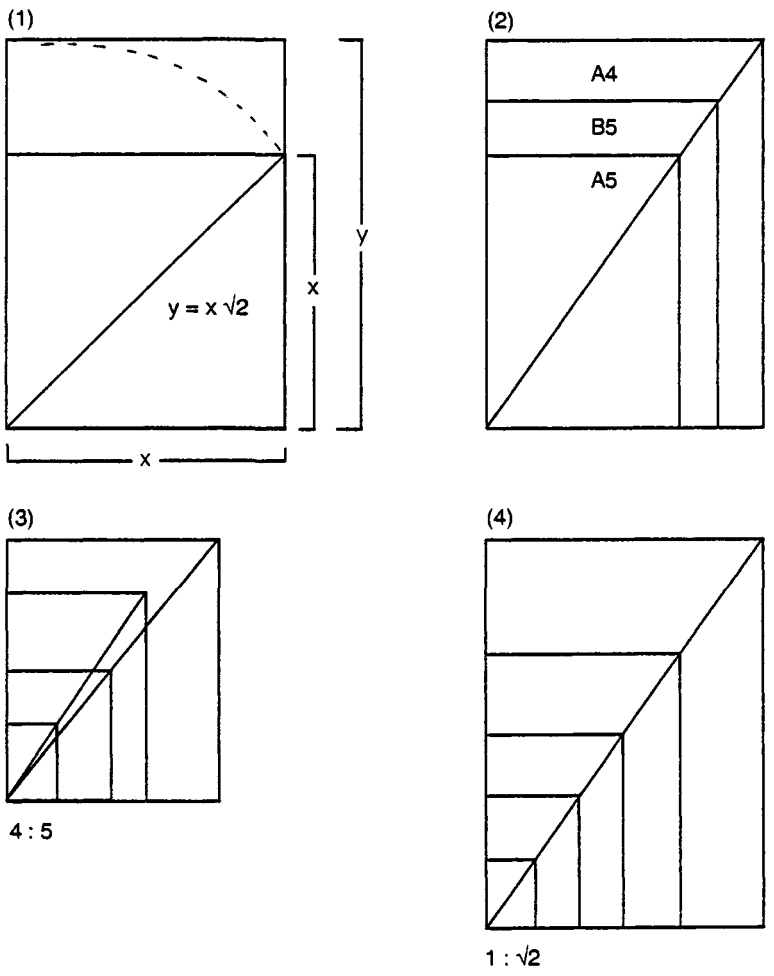


Figure 1/1

ISO paper sizes.
(1) This diagram illustrates the principle of construction and shows that the ratio of the sides of the rectangle is the same as that of the side of a square to its diagonal.
(2) This illustrates the fit between the A and the B series of sizes. For example, B5 falls between A5 and A4, and is geometrically similar.
(3) A rectangle of non-standard proportions. Note that the process of halving generates two geometrically dissimilar series of rectangles.
(4) A rectangle of standard proportions. This case is unique in that halving generates geometrically similar rectangles at each point in the series.

of the original (see Figure 1/1). A rectangle of any other proportion will generate geometrically similar rectangles only at every other point in the process of halving or doubling (Figure 1/1).

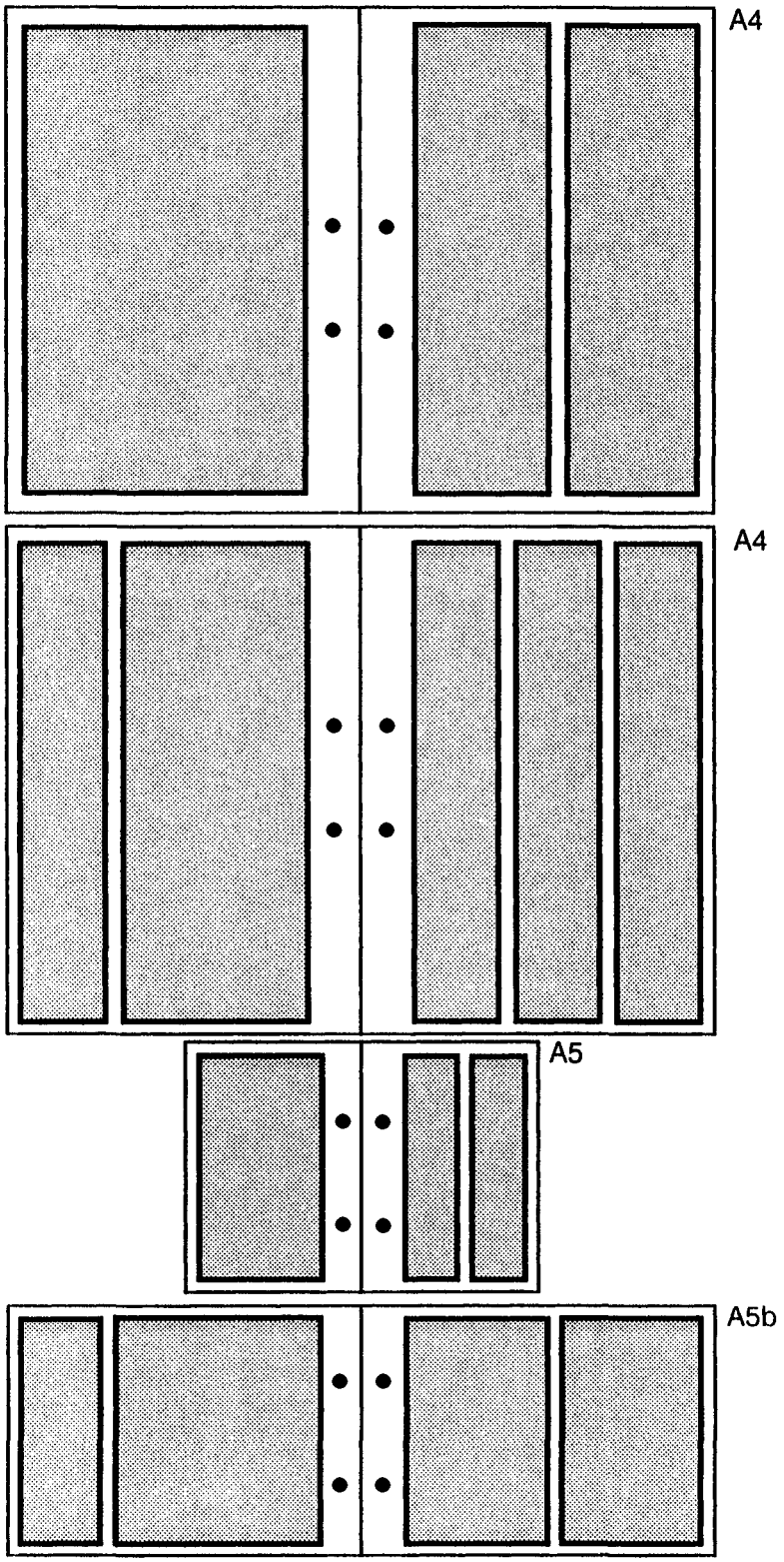
As the pages of a book are made by folding the larger basic printing sheet in half – once, twice, three times or more – all the pages made from a standard size basic sheet will be in the ratio of $1:\sqrt{2}$. Basic sheets which do not conform to this standard do not exhibit the property of geometric similarity when folded to form pages of a book, and this can create waste.

We may note at this point, of course, that documents can be bound at the top (notebook style) or on the left, and that they may be arranged in a vertical (portrait) or horizontal (landscape) style. These variations allow for a variety of page layouts (see Figure 1/2).

However, the astute reader will recognize that I have not chosen an ISO page-size for this book and will rightly ask, 'Why not?' The answer lies in the fact that, as noted earlier, a number of factors contribute to

Figure 1/2

Some possible subdivisions of ISO standard pages.



decisions about which page-size to use, and that some of these may seem more important than others.

Before planning can begin the designer/author has to ask a number of questions, such as:

1. How, when and where will this document be used?
2. How will the document be multiplied/printed/displayed?
3. Do additional specialists need to be consulted?
4. What costs and marketing factors are relevant, and will they influence the design decisions?

In considering question 1, the designer will take into account issues such as:

1a. The weight and size of the finished product and its orientation (horizontal, vertical, or square). Heavy books affect portability and handling.
1b. The method of binding to be used: binding affects ease of opening and thus ease of use.
1c. The storage system likely to be used (shelves, files, etc.): A4 books may be difficult to shelve.
1d. Type-sizes and type-styles.
Is the work to be read at a hand-held reading distance, or some other?
In good light?
In association with other activities?
By younger/older people, with good/poor sight?
Will the work involve foreign language characters, mathematical characters, or special fonts?

In considering question 2 the designer will take into account issues such as:

2a. What constraints the method of reproduction will have on the design decisions.
2b. How the choice of page-size will affect these decisions.
2c. Whether the book will be printed in units of 2, 4, 8, 16 or 32-page sections and how this will affect page size.
2d. Is the work likely to be repeatedly copied, which will degrade its legibility?

In considering question 3 the designer will take into account issues such as:

3a. What role is to be played by the printer (if one is not using desk-top publishing systems oneself)? What printing machine is available? An injudiciously chosen page-size can mean that fewer pages can be printed at one time, and the image area of the printing machine to be used can have a big impact on the cost. If large numbers of copies are required then the increase in costs can be considerable.
3b. Do photographers, illustrators, etc. need to be consulted?

In considering question 4 the designer will take into account issues such as:

4a. What can readers/distributors afford?
4b. Do we need an 'advertising' style?
4c. Is paper quality important?
4d. Do we need a second colour?

All of these issues will be addressed in different places in this book. Here my concern is to indicate that many interrelated decisions need to be made and many of these, in fact, depend upon the choice of page-size.

In choosing the page-size for this third edition of *Designing Instructional Text* I have given more weight to the view that A4 is not a particularly useful size for hand-held reading. A4 is good for presenting notices and structured text which contains large illustrative materials.
One limitation, however, is that the double-page spread occupies a large space when an A4 book is open. A4 books are perhaps, therefore, more appropriate for using on large desks.

In addition, I have also given more weight to the notion that A4 books are more difficult to shelve and, my publisher assures me, to display in bookshops!

It is considerations such as these which come first when designing instructional text. After these decisions have been made (but not necessarily finalized) we can begin to think more about the details of typography. But even now, we still need to think in grosser terms – about how the text should be spaced – before turning to the finer details of type-sizes and type-faces.

Summary

1. The choice of page-size comes first and determines subsequent typographic decisions.
2. The choice is mainly related to how the text is going to be used.
3. The ISO page-sizes have a number of virtues, but the practical limitations of some of the ISO page-sizes mean that other considerations must also be borne in mind when choosing the page-size.

Suggested further reading

Miles, J (1987) *Design for Desktop Publishing*, London: Gordon Fraser.
Misanchuk, E R (1992) *Preparing Instructional Text: Document design using desktop publishing*, Englewood Cliffs, NJ: Educational Technology Publications.

2 Basic planning decisions

This chapter discusses the importance of advance planning in the layout of instructional materials. Here I outline the rationale and use of the typographic reference grid and the value of a document specification chart or style sheet.

The advent of desk-top publishing systems provides the writer of instructional text with an opportunity not only to control the content of such texts, but also to determine the page-design of the work. What is not new is the *reader's* need to use the material without being confused by *ad hoc*, arbitrary and inconsistent arrangements of the text and its supporting devices (such as headings, tables, diagrams, graphs, lists, etc.).

To avoid such confusion requires now, as in the past, careful pre-planning of the work before it is committed to electronic storage and ultimately reproduction. The purpose then of these introductory chapters of this book is to outline basic practices and principles in typographic planning.

If we look at pages (or screens) of instructional text we can see that, unlike a novel, instructional text is complex. Instructional text usually contains a wide variety of components in addition to the text – such as listed information, numbered items, headings and sub-headings, diagrammatic presentations, tables, explanatory notes and pictorial features of many kinds. Typographically speaking, instructional materials are far more complex than novels. And again, typographically speaking, primary school texts are often more complex than those used in higher education.

Furthermore, much of this material is not read continuously. The learner's focus of attention often ranges from one place on the page (or screen) to somewhere else: to another page or screen, to the instructor, to the task in hand, to the blackboard, to another text, to other learners and, of course, back again to that same place on the page (or screen). The layout of the text must support this situation by providing a consistent frame of reference within which the learner can move about, leave and return without confusion.

The principal weakness of much instructional material is that it lacks consistency in the positioning of these functionally related parts. In primary school textbooks, for example, the relative position of the

illustrations and of the text which refers to them frequently changes, both within a page and from page to page. So, as the book is being used, the learner must constantly be asking: 'Where am I supposed to go from here?' (Examples to illustrate this point are presented in Chapter 7.)

This kind of confusion in the sequential organization and the grouping of the parts shows not only a lack of rigour in the initial planning of the pages, but also a weakness in bridging the gap between typographical planning and print production. If one inspects many printed texts it is not hard to come to the conclusion that they are often composed page by page *during* production, on a sort of 'let's put this here' basis. Such a procedure produces inconsistency from page to page, particularly in terms of the spacing and the positioning of related components, such as headings and related paragraphs, illustrations and their captions, etc. One way to avoid this problem is to plan ahead, using a typographic grid.

The reference grid

In the days of hot-metal typesetting the typographic reference grid was an essential element for planning and communicating the design requirements to the printer. Today, it is still useful to consider what such grids achieve when planning one's own text. As can be seen from Figure 2/1a, a *basic reference grid* is a system of numbered coordinates which maps out the *information area* of the page in identically dimensioned modules of space. These modules are determined by making decisions about line length and inter-line space (see Chapter 3).

The information area is that part of the page outside which no printed matter will appear. For many books this information area is a clearly defined rectangle of print surrounded by the margins. In such cases the area devoted to the margins may occupy as much as 40–50 per cent of the page area. (This practice stems from the time when books were bought in sheet form to be folded, trimmed and specially bound in leather by the purchaser for inclusion in a private library. In the case of a book published in several sizes, the size of the information area remained constant. It was the width of the margins and the quality of the paper which helped to determine the size and price of the book: the wider the margins, the larger the book and the higher its price.)

The visual consequences of such past commercial and technical practices still tend to influence thinking about the aesthetics of page design. Nonetheless, today's designer of instructional text is usually more interested in using the space of the page in a manner which is dictated by the structure of the information than in forcing the print to fit rigidly into rectangular blocks.

Generally speaking, at the top, bottom and opening edge of the document, a margin of about 10 mm minimum is necessary for technical reasons associated with the print production process. The fourth margin