

The style files

Appearance affects communication; but not necessarily as you like

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Many people are trained to produce documents that look appealing. For example, many favour the supposedly clean appearance of a sans serif font such as the mainstream Arial. However, research by Australian Colin Wheildon [6] showed that a miserable 12% of readers comprehended a text in a sans serif font; in comparison, 67% of readers comprehended the same text when it was typeset in a serif font (as is the bulk of this document). Not only does a supposedly pretty or clean appearance not equate to effective communication, it is far different.

Decide now whether you are more interested in your own subjective opinion of the look of your document, or whether you are more interested in how to format your document so that *others can most easily comprehend your writing*.

If the former, then stop reading now. I write here only for those who wish to learn to effectively communicate.

Short solution

Wheildon's [6] research shows we should use serif fonts such as Computer Modern or Times. Is there a simple solution to implement for your documents a style that is effective in communication? Silly question: of course there is. The short answer is to *use \LaTeX and accept all the defaults of \LaTeX* .

Knuth and Lamport consulted many professional printers to find out what they did and why. Knuth and Lamport then encoded into \LaTeX the wisdom of centuries of experience in printing. I know many have difficulty accepting this: nonetheless, accept that \LaTeX knows best.

Slightly better solution

Priestly [4] comments that page layout, especially for instructional documents, should best be in two columns with the right column for the main text and the left column for headings, major points and prompts. Fortunately, Hubert Partl and Axel Kielhorn implement such a two-column layout for us in their \LaTeX classes `refart.cls` and `refrep.cls` for articles and reports respectively¹.

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¹Download `refman.dtx` from any ctan site and install.

Apart from font and a left column for headings, what other aspects help readers comprehend our documents? I summarise here some of the aspects reported by Priestly [4] and based upon research into effective communication. I emphasise again, you should prefer such a style not because it might or might not look pretty, but because research demonstrates the style is most effective for comprehension.

Line width

On average, each line should have 10 to 12 words, or equivalently, be roughly 60 characters wide. Human eyes do not scan well wider lines². But we want to save trees by having as much text per sheet of paper as possible. I offer two solutions: either typeset in two columns utilising the whole page; or typeset as a document on A5 paper³ and print two A5 pages per sheet of A4 paper.

Text colour

As Priestly [4] puts it: use any colour so long as it is black. For example, although eight out of ten people consider blue text more attractive than black text, give them a couple of pages to read and their comprehension tells a different story: in one test 70% of readers of black text showed good comprehension, whereas barely 10% of readers showed good comprehension of the same text when it was coloured blue. Colour attracts the eye and can be good for headings, but colour is woeful for comprehending text.

Emphasise discreetly

Modern computer publication allows us almost infinite variety in style. Many writers adopt variety with enthusiasm, but at the unseen cost of confusing their readers. Here are some rules of thumb.

- Use bold only for navigation: bold text is much less readable. In one test, 70% of readers comprehended a text in ordinary font, but only 30% of readers comprehended the text in bold. Bold font attracts the eye and thus in headings and definitions usefully helps a reader to navigate around a document. Bold is not useful for comprehending sentences.
- Never use all capitals: we recognise words partly by the shape of their outline, and all capitals destroys that shape; use lower case.
- Similarly avoid underlining, reverse type, and outline type.
- Italic font also degrades the word image and thus interferes with reading. Use italics when you emphasise, but use it sparingly.
- Placement is your most effective tool for emphasis. Ensure that: your most important sentences are at the start or end of each paragraph; your most important paragraphs are at the start and end of each section.

Summary

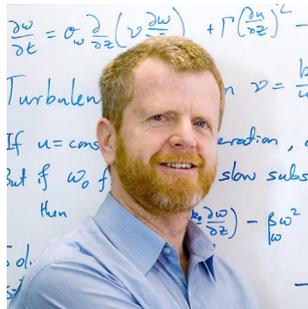
Learn to love the default style of L^AT_EX: it is close to being the best that research shows is effective for written communication.

²This is why L^AT_EX in 10-point font has more characters per line than L^AT_EX in the larger 12-point font.

³Use the `a5paper` option in the `geometry` package.

References

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- [6] Wheildon, C. (1986). *Communicating? Or Just Making Pretty Shapes*. Technical report. Newspaper Advertising Bureau, Australia.
- [7] Zobel, J. (2004). *Writing for Computer Science*, 2nd edn. Springer, London.



Tony Roberts is the world leader in using and further developing a branch of modern dynamical systems theory, in conjunction with new computer algebra algorithms, to derive mathematical models of complex systems. After a couple of decades of writing poorly, both Higham's sensible book on writing and Roberts' role as electronic editor for the Australian Mathematical Society impelled him to not only incorporate writing skills into both undergraduate and postgraduate programs, but to encourage colleagues to use simple rules to improve their own writing.