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Book review

Teaching Mathematics with ICT

Adrian Oldknow & Ron Taylor, Continuum, London, 2000. 243pp. ISBN 0-8264-4806-2 (paperback). £18.99.

This book forms part of a useful series: Integrating Information and Communications Technology in Education, which aims to provide readers with practical ways of using ICT to improve pupils' curricular learning. Other books in this series include '*The Role of IT*', by Avril Loveless and '*The Internet in School*', by Duncan Grey.

Both authors of this book are well known and respected in their fields: Adrian Oldnow is Professor Emeritus of Mathematics and Computing Education at University College Chichester and Ron Taylor Inspector for Mathematics in Hampshire LEA. This, for me, is the key to the book's success, creating confidence in this reader at any rate that, by and large, they have got it right! The book's scope is extensive, covering in a surprising amount of detail the use of spreadsheets, TI Interactive, Derive, Logo, Cabri and graphing calculators (as well as dabbling with a few others). Tucked into the back cover is a CD-ROM for MS Windows-based computers, comprising 30-day trial copies of the full versions of TI-Interactive! and Derive. The disc also contains a demonstration version of Cabri Géomètre, which has most of the functions of the full version. For information about ordering full copies of these, you can go to the Texas Instruments web site (http://www.ti.com/calc/).

In a valuable introduction (which would make a useful starting point for any professional development course in ICT), a number of key issues are set down. For example, we are reminded that many of the techniques associated with school mathematics were developed to solve certain types of problems before electronic calculators or computers were around. It is certainly the case that newer skills, such as modelling, estimating, hypothesizing and so on are becoming more important than the traditional skills of accuracy and recall. We also need to recognize that, while ICT alone does not determine, or necessarily affect the mathematics curriculum, it makes certain difficult, but increasingly important, topics (such as matrices and complex numbers) more accessible to pupils.

The remainder of the book is organized around the following five questions:

1. *What* ICT is there to use?
2. *Which* aspects of school mathematics are amenable to its use?
3. *How* to select and plan for its effective pedagogic use?
4. *Why* should we aim to integrate ICT into mathematics teaching?
5. *Where* is it going?

Chapter 1 looks at the resources available, listing first the hardware in the form of graphing calculators and the PC (sadly, no mention of the Mac) followed by an extensive selection of software. This section is for the reader to work through alone and covers the programming languages of Basic and Logo, as well as graphing calculators (TI-83), data logging, spreadsheets, computer algebra systems such as Derive, dynamic geometry software (Cabri) and the graph-plotting, data-handling and mathematical communication capabilities of the excellent package from Texas Instruments, TI Interactive. This section ends with a peep at a selection of useful websites such as those of The Mathematical Association and BECTa.

Chapter 2, by far the longest in the book, deals with ICT and the school curriculum, providing many useful ideas for its use in, amongst others, number and algebra, geometry and trigonometry and statistics and modelling. The overall strategy is one of 'Theme and variations', where a particular aspect of the curriculum is chosen and then suggestions are made for several different ways of supporting it, depending on the ICT available. This is a chapter for dipping into and returning to later, rather than reading straight through. After many of the examples are 'reader activities' indicated with a pencil icon in the margin. The authors manage to avoid patronising the reader, providing a set of sensible tasks that test or extend your own skills, invite you to think about how you might continue working on the activity with pupils or ask you to think about how the activity might be adapted for use with a different ICT tool. The section that particularly caught my eye was 'Statistics and Modelling', not least because it began with a presentation of the PCAI data handling cycle attributed to myself. Unfortunately, the authors got it a bit muddled, with the last two stages being switched around. So if you find yourself being seduced by the 'PCIA data handling cycle', don't be fooled! In fact, this was one of the few errors I picked up in a rather complex book that must have been difficult to proof read. Another small gripe, while I'm picking nits, was the notation used to describe graphing calculator key sequences, which was quirky and rather unhelpful?

Chapter 3 deals with how to plan for effective ICT use, using a selection of teacher-written case studies where they described and evaluated their lessons. The final two (short) chapters explore more philosophical questions concerning why we should integrate ICT into mathematics teaching and what the future might hold for ICT, both in the workplace and the classroom.

Overall this is a most valuable book that is well worth its place in any school or college mathematics department. If you have ever been confused by the many government initiatives, bodies and documents that abound in this area, you will find them clearly described and referenced here. Inevitably, some of it is already out of date before the ink is dry, but most parts of the contents are still highly relevant, and the numerous Web references will help to keep your understanding at the cutting edge. If I had not been given this copy for review, I would certainly have bought this book—I know of no other source that tackles the ICT/mathematics scene in the UK with such authority, clarity and comprehensiveness.

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