

Micro Math

Reviews

Teaching Mathematics with ICT

Reviewer: **Keith Jones**

Teaching Mathematics with ICT
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Open this book just about anywhere and you could easily find yourself getting drawn into doing some mathematics. That is one of the strengths of this book. Its focus is on the mathematics. The technologies used and explained are tools in the service of mathematics rather than the mathematics being used solely as a vehicle for learning technological skills. The book is primarily aimed at teachers of mathematics in the secondary age-range, although teachers working outside this age-range should find plenty of food for thought.

As might be anticipated, given that the book is written by two knowledgeable authors, it covers a good range of technologies (computers, graphing calculators, interactive white boards, the internet). Yet it is their passion for mathematics that stands out. Almost half of the book is devoted to a series of mathematical tasks, each one tackled with carefully-chosen technology, structured to illustrate how technology can serve teaching across and beyond the mathematics curriculum. As well as reasonably familiar approaches, such as using a spreadsheet to explore number sequences, tasks include using logo to create a numberline *microworld* and using

dynamic geometry software to do algebraic modelling and explore iterative processes. There are also numerous examples of applications of mathematics, including cross-curricular possibilities such as the mechanics of the steering mechanism for cars.

Being drawn into tackling some of these mathematical tasks, and trying the approaches suggested, is part of the process of knowing how to turn these ideas into lessons. One thing the book does not attempt to provide is "off-the-shelf" lessons. This is a book that demands attention over a period of time and can be safely returned to time after time to inspire and intrigue. In supporting the development of lessons, another major chapter of the book contains a range of detailed descriptions of a variety of actual mathematics lessons, each of which uses technology to support the teaching and learning of mathematics. In some cases, these come complete with lesson plans, in others there are accompanying comments from the teacher and often from pupils.

In terms of practicalities, the book comes complete with CD-ROM which provides trial versions of some of the software applications utilised in the book (such as the algebra software *Derive* and the dynamic geometry software *Cabri*). There is also support material on the CD for graphing calculators and add-ons such as data-logger. Usefully, a range of additional materials, including versions of all the program files referred to in the book, is available

on a website provided by Texas Instruments, see:
<http://education.ti.com>

An engaging feature of the book is the writing style. This is a journey and the writers are right beside you. For example, chapter 1, which delves into what resources are (and soon will be) available, reassuringly begins "this chapter is for you to work on privately" (which is very helpful if you feel you ought to know about every variety of hardware but find it difficult to keep up with developments) while the chapter on planning lessons ends with the authors saying "good luck" as if they mean it (and would be interested in hearing how you get on).

It is quite a feat to write a book like this. Technology changes rapidly, and any reference to Government documents quickly dates too, as one initiative follows another. I think I would have preferred a little less use of lists of bullet points extracted from various UK Government publications. It is understandable that UK teachers will look for mentions of the National Curriculum, yet if they look for the Key Stage 3 Framework they will find nothing (presumably the book was already in press). As the mathematics covered in the book mostly transcends particular policy implementations, maybe some of the references to Government documents would be best left to an appendix (which could be updated on a dedicated website). Similarly, the use of extracts from the TTA "ICT needs identification", in its

tendency to promote a tick-box approach to ICT skills, is hardly an inspiring document and, as such, tends, for me, to undermine the main aspirations of the book.

A relatively minor role in the book is given to research on the use of ICT in teaching mathematics. At times, it can seem like the authors are saying no more than “and here’s something else you could do” without any substantiated evidence that this is any more useful than a different approach (and perhaps using a different technology, such as pencil and paper). The book does make passing reference to the enormous

amount of research that has been published, and it includes a useful bibliography, yet, in this age of evidence-informed practice, the evidence for the approaches advocated in the book is rather underplayed. Also a little underplayed are the educational complexities illuminated by rapidly changing technology, such as questions about the nature of mathematics, and what mathematics can be taught. The introduction to the book does refer to some of these complex questions, and returns to them in the final chapter, yet they remain relatively hidden. While, as the authors indicate, “most teachers do

not have a great deal of control over the curriculum they teach”, a little more could have been done to stimulate some creative thinking and a greater sense of ownership.

This is a book that should certainly appeal to mathematics teachers. It is not an easy book with instant answers but a book that will reward working with over time.

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