Reading List

As teachers, we are all expected to think about how people learn mathematics and how we can influence the process. It is part of our professional responsibility to question what we do and to become more effective at doing it. The reading matter suggested below is meant to stimulate both your theoretical and practical thoughts on the subject.

Books


   *I like this opinionated book. Krantz is a real mathematician and is not shy about giving his personal take on the nuts and bolts of lecturing. At the end of the second edition Krantz is big enough to include critical counter-views from 10 colleagues.*


   *Mason is also a mathematician by training and usually has some thoughtful and helpful things to say about mathematics education and teaching. Also he has recently co-edited the following book, a copy of which has been ordered for the Institute Library.*

3. *Fundamental Constructs in Mathematics Education* edited by John Mason and Sue Johnston-Wilder. (RoutledgeFalmer: Open University, 2004, ISBN 0415326974 (hardback) and 0415326982 (paperback)).


5. A more general introduction to teaching in Higher Education can be found in *Preparing to Teach* by Graham Gibbs and Trevor Habeshaw. It is published by Technical and Educational Services Ltd, Fifth Reprint 2001, ISBN 0947885560 and copies are given to all participants of the generic version of the WTC.

Articles

The articles on this list have been chosen from suggestions made by colleagues who work in mathematics education in response to my request that they should be accessible and of interest to mathematicians as well as educationalists. Feedback on the value of the articles would be greatly welcomed by me,

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David Mond ([mond@maths.warwick.ac.uk](mailto:mond@maths.warwick.ac.uk)).

It is my intention to put copies of those articles that are not locally available in a folder in the Maths Education section (QA11) of the Institute Library.
Warwick Teaching Certificate (Mathematics Variant)

1. Alcock, Lara: 2004, “Mathematicians’ Perspectives on the Teaching and Learning of Proof” (Preprint accepted for publication in Research in Collegiate Mathematics Education.)

   *This article is based on interviews with mathematicians and has some entertaining anecdotes, but also some collective insight into what students actually need to learn in order to become good at proving.*


   *A paper about what students need to do in order to read proofs - the data is from Warwick.*


   *The two previous articles give quite different views of linear algebra teaching (one relatively traditional and from a mathematician’s perspective, one less traditional and from a maths education perspective).*


   *This is aimed at mathematicians and focuses on some of the problems with teaching some abstract algebra and gives an alternative approach based on a rather old package called ISETL. Interesting nonetheless. There are more interesting newer papers on abstract algebra from the same research tradition, but they’re less accessible.*


A nice paper on two approaches to proving in an abstract algebra context. Not too much eduspeak, but pretty strong methodologically.


Web Collections

1. The Learning and Teaching Support Network (LTSN) for Mathematics, Statistics, and Operational Research (MSOR) has a searchable database of reviewed educational research. It was prepared by Adrian Simpson (of Warwick) and Lara Alcock, who have annotated the entries with brief helpful comments. You can search the database by author, by title/keywords, or choose between three useful categories defined by level and approach. It can be found at

http://ltsn.mathstore.gla.ac.uk/resourcecollection/

2. David Tall was a student of Michael Atiyah’s and began his Warwick career in the Mathematics Department. When his research interests moved towards education, he joined the Warwick Institute of Education and gradually established an international reputation as an original thinker in the field of mathematics education. A collection of his research papers, many of them PDF downloads, can be found at

http://www.warwick.ac.uk/staff/David.Tall/research.html

3. The educational issues and concerns of physicists are often close to those of mathematicians. For this reason, you might like to peruse the Annotated Bibliography of Research into the Teaching and Learning of the Physical Sciences at the Higher Education Level, prepared by David Palmer for the LTSN in Physical Sciences. It can be downloaded from http://www.physsci.ltsn.ac.uk/Resources/PedagogicResearch.aspx.

Trevor Hawkes
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