Embracing Mathematics: On Becoming a Teacher and Changing With Mathematics

Author: Peter Appelbaum with David Scott Allen (and others).
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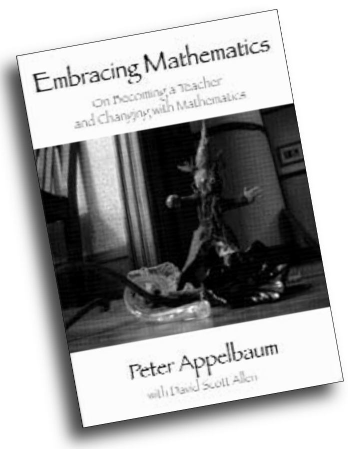
My formal teacher-training began in 1972, and I have worked in schools and teacher-education ever since. I have read many books about education, generally, including many that focus on training school teachers, and many that discuss mathematics education, and some that specifically focus on training school mathematics teachers. Appelbaum and Allen's book *Embracing Mathematics*, is one of the strangest of these books that I have ever come across.

Appelbaum explains the strangeness by declaring that it is, intentionally, an "alternative methods text" (p. xxi). Indeed!

Part of this strange alternativeness is that it explores primary, secondary and post-secondary, and it is aimed at student-teachers as well as teachers.

Appelbaum's Prologue begins with the question: "What does it mean to be a teacher of mathematics?" His own answer is subtle and imprecise. It rests on seeing the essence of mathematics in its *use*—what he calls "mathematizing". He acknowledges that this is how the pioneering early 20th century philosopher Ludwig Wittgenstein approaches the challenge of defining something: explore how it is used! Appelbaum expands the idea of "mathematizing" further as being equivalent to "embracing mathematics". Then he adds to this that, in his view, teaching is learning (as an alternative to the latter word he also uses the word "studenting" to highlight this), and learning is teaching; and he says, "I am always becoming a new person".



The paradoxical conclusion is that if Appelbaum can say what it does mean to be a teacher of mathematics then he is no longer growing and changing, and hence is no longer *becoming* a teacher of mathematics. An "arrived" teacher is no longer an active growing-teacher.

The slippery subtleness of the discussion should be starting to become clear. The words seems to be simple and everyday, but they are used in challenging ways, and need careful critical consideration to reveal their (likely) intentions.

Almost certainly there is a good book in this challenging discussion, but it is well hidden—or, it is structured and written in ways that make it hard to know where you are, or what you are actually reading or meant to understand.

To begin grasping the richness of the challenges, it must be understood that each chapter (presumably by Peter Appelbaum himself) is followed by a reflective commentary by David Scott Allen, but then each chapter-reflection is itself followed by what are called "Action Research" discussions from a range of other contributors: Isaiah Manzella, Karen Cipriano, Ada Rocchi, Colleen Murphy, Kristen Iaccio, and Petal Sumner (all school teachers). There is more: each Action Research section is followed by a MathWorld section that poses questions, mainly mathematical, but some more broadly educational, like a worksheet. In one of several appendices, Bernadette Bacino offers solutions and hints for the six MathWorld sections. There is even a "songsheet" with words for a song called "Polya Was a Mathematician", to be sung to the tune of "Joy to the World" (not the traditional Christmas carol, but the 1970 hit by Three Dog Night which starts, "Jeremiah was a bullfrog…").

David Allen, a teacher in his own right and at one stage a trainee-teacher student of Appelbaum, introduces the whole book with a Preface, "How Can I (Better) Embrace Mathematics?". He also has an almost-concluding Afterword, "What Will You Write in Your Chapter?" The book, if nothing else, offers itself as a large multi-voice conversation on its many topics, mainly concerned with thinking mathematically and communicating this to others. Clearly the reader is expected/invited to "embrace" his or her own "becoming" by joining the conversation—hence the challenge of writing one's own "chapter"!

Following the "Brief Contents" that in the usual way lists the official name of each chapter and major follow-on sections, the rather larger Contents listing is an annotated summary of the broad ideas of each chapter and its major sections and contributors.

As noted, the effect is partly like being at a very noisy and busy party—a lot of people have the opportunity to do a lot of talking at you!

When the discussions get going they use long paragraphs, and pages are often broken up by grey-shaded challenges to think about education, or mathematics, or both.

The stance is deliberately post-modern, and uses the reader's reaction to the Quentin Tarrantino film Pulp Fiction as a kind of cultural litmus-test. If you focus on the film's violence, you are "modern" in mind-set; by contrast, if you focus on its humour you are seeing its irony and have a "post-modern" mind-set. That is, the film is seen as being different from how it appears, like a pop-star's stage persona being different from the actual personage of the pop-star: here "irony" is the discrepancy between immediate appearance and possible underlying but different truth. [In my case, I know about the film, but have not seen it: what does that say about me?]

Consider the Name (cited author) Index. Some familiar, possibly expected names are present: Polya, Lakatos, John Mason, Carraher, Lave, Davis and Hersh, Dewey, Escher, Fermi, Howard Gardner, Herbert Ginsgurg, Herbert Kohl, Mellin-Olsen, Noddings, NCTM, Piaget, Reys, Vygotsky, Walkerdine. Some unexpected names also appear: Bettelheim (a psychoanalyst), Bourdieu (a French philosopher), Buber (a German existential theologian), Foucault (a French philosopher), Frankestein and Powell (ethno-mathematicians), Freud(!), Noel Gough (an Australian post-modernist educational theorist), Edgar Allen Poe (an American literary giant), Rorty (a philosopher), Winnicott (a psychoanalyst of infancy and motherhood). Some possibly expected names do not appear at all: for example, Martin Gardner, Zoltan Dienes, Robert B. Davis, David Tall, Martin Hughes, W. W. Sawyer, John Holt, Richard Skemp… [Who are your (mathematics) education gurus?]

The focus on post-modernism, and ironic ambiguity, is deliberate: Chapter 2 is a "Psychoanalytic Perspective" that explores teaching as concerned with "libidinality" in learning—not that this is directly related to "libido" as it usually understood, namely as sex-drive, but as something more to do with "psychic and emotional energy associated with biological drives" (p. 51).

The Subject Index is interesting, but needs further development. Some index-items are not at their cited pages (e.g., sabermetrics). Some items that ought to be in the Index are omitted (e.g., constructivism).

Some topics are talked about but not explained, or do not offer indicative examples (e.g., rubrics: the word appears several times, with not a single rubricor part of a rubric ever presented).

Some valuable topics are highlighted and indexed (e.g., problem-posing, reading, group work).

Some essential topics are not considered at all (e.g.: numeracy; mathematics across curriculum areas; mathematics in the workplace; mathematics in everyday life; and mathematics learned through ICT-facilitated experiences).

Overall the many practical classroom activities (problems and investigations) are excellent. Sadly, they are buried in the body of the text, with few of them identified as easily retrievable index-items.

We can be assured that Appelbaum, and his co-contributors, have worked for years developing and trialling draft versions of the chapters and their materials. This suggests that the materials in the book can be made to work: that is, they have been shown to be effective as a means to train student-teachers and stimulate experienced teachers undertaking post-graduate study.

For me, this is not a book I would offer to student-teachers, unless they are confident critical readers, and hell-bent on exploring the philosophical depths of a post-modernist view of a curriculum (and pedagogy) that is, by its historical nature, fundamentally traditional—and/or they have a playful rebellious streak.

I would recommend this book for strong-minded, adventurous thinkers who want to explore things such as Bourdieu's "habitus" or Deleuze's "nomadic epistemology", or Britzman's endorsement of "perversity". A graduate student, or a thoughtful professional, who wants to see what else *might* be possible in the broad territory of "mathematics education" and "education" and philosophy of culture, will find a great deal of stimulus here!

Otherwise I would happily plunder it for good activities, and skip the background theory, or pick the eyes out of the more personally interesting, and convincing theorists that Appelbaum and confederates draw on, such as John Mason.

Reviewed by John Gough, Deakin University

The Creative Use of Odd Moments

Author: Doug French

Published: The Mathematical Association, Leicester, UK, 2007

ISBN 0-906588-626

Available from AAMT: $42.00 for members

There are often times when a maths teacher might have a few minutes to fill in a lesson, be looking for a worthwhile and challenging exercise for a few students, or just want to motivate a group with something a bit different. This book will provide many such examples, although I would strongly encourage the user to try the problems before launching them on a class!

The *Creative Use of Odd Moments* is a publication from The Mathematical Association in the UK. It contains 80 examples of short mathematical tasks and items of interest, with accompanying solutions, explanations and ideas for extensions. The tasks range in difficulty but would, in my view, be suitable for most middle years mathematics classes. Most are tasks which generally require some investigation and exploration, but which may be considered fairly superficially or in greater depth considering algebraic justifications, etc., depending on the cohort of students and the time available.

This little book includes a CD which contains both the book contents in PDF format and some PowerPoint slides of

each problem, which may be produced for the students, shown on a board or simply posed verbally as required. The book is actually a collection of the association's Odd Moments sections from their publication *Mathematics in School*, published between 1993 and 2001, with additional teacher notes and explanations. A couple of examples:

> #51 How many straight cuts are needed to cut a 4 by 6 bar of chocolate into 24 separate pieces. Can you do it more than one way?

This exercise is actually a special case of a simple and more general result that tells us the number of tears needed to split a piece of paper into n pieces is $n - 1$.

> #68 In how many ways can you shade 3/8 of the squares of a two by four rectangle? In how many ways can you shade 5/8?

This problem lays a foundation for a revisit when considering Pascal's Triangle in later years.

I highly recommend that any teacher of middle years mathematics classes should have a closer look at this publication and consider it for both a faculty and personal library.

Reviewed by Carol Moule

Peter Appelbaum, 2008, Embracing Mathematics: On Becoming a Teacher and Changing with Mathematics. New York: Routledge. 344 pages. ISBN-13: 978-0-415-96384-8 [hardcover], RRP Sept 2009: $150.00; ISBN-13: 978-0-415-96385-5 [soft cover], RRP Sept 2009: $49.95. Authors.Â Speculations on qualities of difficult knowledge in teaching and learning: An experiment in psychoanalytic research. International Journal of Qualitative Studies in Education, 16(6), 755â€“776.CrossRefGoogle Scholar. Walkerdine, V. (1984). Developmental psychology and child-centred pedagogy: The insertion of Piaget into early education. In J. Henriques, W. Hollway, C. Urwin, C. Venn & V. Walkerdine (Eds.), Changing the subject: Psychology, social regulation and subjectivity (pp. 153â€“201).