

# Editorial

I assume we are all “for” the learning of mathematics. We are in favour of people doing it, we do it ourselves (or did, once), and we try to help others do it

But being “for” the learning of mathematics in the sense of this journal’s title means more than generalised approval. It means making an important issue out of the learning of mathematics, not taking it for granted, not remaining content with being ignorant about it. It means being aware and becoming aware of difficulties to study and to resolve. It means putting into circulation ideas and techniques that will eventually benefit those who want to learn mathematics

This is not a short term agenda. Learning mathematics takes time, learning about the learning of mathematics takes more. There is no accredited body of knowledge in this field, no standard texts to start working from.

There is, of course, a vast reservoir of experience; we each have access to some of it because we have all been, and still are, learners. Yet we can simultaneously show, by learning some mathematics, that we know how to do it, and when asked how we do it, say we don’t know. Most of our experience lies inert — unnoticed, therefore unarticulated, therefore undiscussed and unevaluated. Experience cannot teach if we pay no attention to it.

Teaching is much easier to talk about than learning: it’s more visible, more audible, more out in the open (or so at least it appears). Opinions are immediately available, prescriptions are possible, suggestions can be made (“Try this with your class on Monday”) There’s the attraction of talking about something done, or to be done, and the awareness that the teacher, when on the job, *has* to do something. So it all seems practical, down-to-earth, dealing with the real problems.

The consequences of teaching, though, are not always so straightforward. Students do not always learn what they are taught: generations of students make similar mistakes, go on making them even when a bright new method of teaching is tried, and frequently appear to have learned things that no one can have intended to teach them. Inexperienced teachers say, “I cannot understand why they cannot learn such-and-such”, and experienced teachers know that at any particular time they have only a hazy idea what their students are actually learning. From this angle the learning process looks very mysterious indeed.

But if we switch away from a concentration on institutionalised teaching we can allow ourselves to remember how much everyone learns without being taught. The most dramatic examples are pre-school children, who start from scratch and yet conquer so much in so short a time. Adults — like ourselves — have learned many times more than they ever learned under instruction. The students we are teaching are learning much more than we are teaching them. These reminders cut teaching down to size. In this perspective the place of teaching as a necessary provoker of learning shrinks to a small part of the total picture. Indeed, perhaps the real mystery is how teaching which systematically ignores the fact that students already know a lot about how to learn has any successes at all.

Suppose that instead of taking the position that teaching should provoke or cause learning we try saying that *effective teaching is contingent upon learning*. We could give this both a global and a local reference: globally, let us say, teaching should be governed by principles abstracted from what we can discover about the mechanisms of natural, spontaneous, “self-taught” learning; locally, say, teaching should be responsive to the inner learning movements of these students (or this student) in the here and now.

How does this sound? To me it sounds as if it asks some very good questions. It also strongly suggests that teachers and educators would have to *know* learning in a way that at present they do not: that they would have to become students of learning, not merely practitioners of it.

All the evidence we could need for the study is around us and inside us. But nothing will happen until more of us allow the phenomenon of learning to become a problem for us, until we fetch it up out of the realm of things we take for granted, or that we suppose are too mysterious to know, and let it show us how we may comprehend it. If some of us do this, there will be some substance to our claim to be “for” the learning of mathematics.

From the next issue on, the “Letters to the Editor” heading will be replaced by “Communications”. The change is a sign that material for this section can take a variety of forms, not only that of a letter, and that anything published in it is not less significant than in any other part of the journal, just generally shorter. I urge readers to make full use of this space, which can expand to meet the need.

Psychological concerns occupy a number of pages in this issue, but Steve Brown’s article makes it clear that there is still plenty for others than psychologists to say about mathematical problem solving. As Brian Greer suggests, psychologists may choose to work on mathematical questions for reasons of experimental convenience; when they do, they generally take the mathematics for granted. The articles by David Henderson and David Pimm may remind us that we should not forget to scrutinise the peculiarities and powers of mathematics itself.