

Response to Babu Prasad

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Dr Prasad constructively opens debate by his comments on many issues in maths education. My response to Dr Prasad comes from a desire to add to that debate based on my experiences as an educationalist in the west. Having only been in Fiji for 6 months, I offer my first impressions and hope others will also respond to the issues.

As far as Dr Prasad's main recommendations are concerned, I would support separate curricula and examinations being offered beyond Form 4 for those pupils who are not college orientated. At present many pupils fail Form 6 or drop out long before. An alternative program of study could be designed to meet the needs of these pupils. However, the nature of such an alternative program requires significant debate. In my view it should not either simply be a watered down version of the present curriculum or consist solely of consumer arithmetic, but should include some challenging mathematics which has starting points accessible to the pupils concerned.

Dr Prasad makes some interesting points about the content of the current maths curricula. I agree that computers should be a separate subject from mathematics but there are many different views about what constitutes computer education. In my view most students should learn how to use computers for different purposes, and their use should be integrated into every subject in school. Only a few people will want or need to learn computer programming.

I am wary of agreeing that algebra and co-ordinate geometry should be emphasised, especially if this means more of the same. The problems students experience in these subjects may have more to do with the nature

of teaching methods, an area ignored by Dr Prasad except to criticise discovery methods. No definition of discovery methods is given, nor any evidence for the claim that they have largely been discredited in the West. From the classroom observations I have been able to make so far in Fiji, students seem to be trained to copy terms, definitions and procedures, but are rarely taught to think mathematically. Mathematics is presented as a strange foreign language to be memorised, the strange language having little relationship with anything outside the maths classroom. However, mathematics is much more than this; it is a process; it is activity; it is about model building of the real world; it can be said to happen whenever the mind clarifies and creates structures ... and a lot more besides. Teaching methods should be employed which recognise such a wide definition. Methods should recognise that students are active learners and already have a wealth of formal and informal mathematics, as well as differing attitudes to learning. Students do not come to the classroom as empty slates to be written on. Teachers should use techniques which try to access and build on children's existing skills and concepts. If students only ever practise procedures using questions in the textbook, teachers may find out which procedures students can successfully follow but they are unlikely to find out how much students understand of what they are doing. The mathematical activities given to students should therefore sometimes involve students in asking their own questions. For example - instead of asking students to work out the area of a page of rectangles, with the lengths of sides given, one can ask students to draw all rectangles they can find with, say, an area of 20cm^2 (perhaps they can also choose the target area themselves). Students are more likely to experience interest, challenge and meaningfulness when working on their own questions.

Other aspects of the curriculum content should also be questioned. In particular, the Maths curriculum is often assumed to be culture free. "Why is it 180 degrees and not, say, 100 or 150? Where does the idea of negative number come from? Authoritative writers on mathematical history have given answers to these kinds of questions, of course, and they demonstrate quite clearly that mathematics has a cultural history. (Bishop, 1989)" I would like to examine the whole cultural basis of the present curriculum and ask how maths can be made culturally relevant to

Fiji. Most students learn maths in a second language: in what ways does this make maths more difficult? Are there terms which have very different meanings in Fijian, Hindi (and the other languages used by Fiji's students) and English? Can/should the mathematical skills of mat or basket weavers, or the potters who produce completely spherical pots without a wheel, influence the curriculum?

Assessment is a major area discussed by Dr Prasad. I too would question the form of the exam, and would agree that project work should be included. However, projects should not be restricted to those related to consumer problems. Pupils should be involved in the development of the project topic.

When looking at ways to improve maths education it is often easier to look at textbooks or the curriculum than it is to consider the major classroom resource: teachers. We forget to listen to the past which would tell us that textbooks have been 'improved' but there is still no change in the classroom (Sundari Muralidhar, 1989). We press for more research, and do not look at the experience in the west, where a lot of research has been carried out but classroom practice has remained unchanged by most of it. Teachers will only change their practices when they themselves see that changes are merited. Curriculum change will only be fully implemented if teachers are involved in and own the development of change. I would favour action research, in which teachers are involved in investigating, through their everyday teaching, some of the issues in maths education, and come together regularly as a small group to discuss their observations and insights. (Better Mathematics, HMSO, 1987; Howson, 1983). As a maths educationalist and USP lecturer, I can help to raise the issues, but practitioners should be involved in looking at the validity of these issues and their practical outcomes. I can say that more active learning should take place, and the curriculum should respond more to the different cultures in Fiji. However, teachers themselves should be involved in saying how that active learning might take place, how (for example) mat patterns or weaving might influence the curriculum and how children's learning and understanding should be assessed.

Despite these comments about research, I agree with Dr Prasad that more research needs to take place in many aspects of maths education. Very little research has been carried out in Fiji and in the South Pacific generally, and in starting my own research I have difficulty avoiding being side tracked into other related areas, since so many questions occur. However, if research is to have practical outcomes, to benefit children's learning, we need to avoid the usual results - that of research reports gathering dust on shelves. This will involve asking such questions as: Who is to choose the aims of the research? and, Why is the research being carried out? This leads me again, in conclusion, to repeat a point I would like to emphasise: we must involve teachers.

References

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