# British Math Fails to Add Up

*Nicholas Pyke*

## Progressive Methods Blamed for Gap Between England and the Continent

Modern teaching methods and sloppy thinking have undermined British math, leaving secondary pupils in England and Scotland trailing far behind their international peers, according to new research.

The most comprehensive study of its kind so far shows youngsters in a range of countries, including Germany, Hungary and Singapore, outstripping British teenagers. Schools in these countries insist on rigorous whole-class teaching and ban pupils from using calculators.

Academics are now making films of Hungarian math lessons to help British schools improve.

The findings, which have attracted interest from the Office for Standards in Education, come hard on the heels of a critical study by the National Institute for Economic and Social Research. This said that British 10 year olds are two years behind their continental counterparts.

Both pieces of research were funded by the Gatsby Charitable Foundation which staged a major math seminar in Birmingham. Conducted by Exeter University, it shows that British secondary pupils start from a lower level and then make less progress than students abroad—with alarming implications for the U.K.'s engineering and technological future.

Professor David Burghes from Exeter's school of education blamed inadequate teaching methods allowing pupils to "chop and change" math topics, without fully understanding the material.

"It is time to question our so-called 'progressive' methods," he said. "A much more sensible approach is needed—for example, we must not be afraid to say a pupil's work is wrong because it is so difficult to correct misconceptions introduced at any early age.

"We do seem to be underperforming in comparison with both European and Far Eastern countries. Since math plays such a central role in technological developments, it is a real concern for many that we are lagging so far behind."

The researchers from Exeter gave exactly the same math problems to 13 and 14 year olds in 17 countries over two to three years. They included England, Scotland, Germany, Hungary, Poland, Singapore, Japan, Thailand, Greece, Holland and Finland.

English 13 year olds scored, for example, only 11.3 out of 50 in algebra, and Scots scored 9.6. But Germans taking the same test managed 12.5, Polish children averaged 16.6, while those in Singapore got 23.9. By the age of 14, the differences had increased further. English pupils scored 14.4; Scots 13; Germans 17.6; Poles 24.9; while Singapore pupils reached 30.7. There were similar results in tests on shape and space, and number.

"Math in other continental countries is characterized by the teacher playing a central teaching role, not a management role as we see so often in the U.K.," said Professor Burghes.

"Whole-class interactive teaching is the norm with teachers adept at bringing everyone into a discussion—often choosing the stragglers to work through exercises. In short, they keep all the pupils on task.

"Math is always written and spoken clearly and precisely. Calculators are not used in primary schools and only allowed in secondaries when pupils have gained that all important feel for number."

Other countries, he said, back up the classroom work with homework and regular written tests.

"We no longer treat math as a precise and exact science. The discipline of actually writing equations correctly, for example, is not tested in the way it used to be, and in the way it still is on the continent.

"If a kid's got the right answer, we now tend not to worry about the working in between. German colleagues have been appalled by what they've seen going on in British classrooms."

Professor Burghes is also doubtful about the mathematical expertise among primary teachers. "The weaknesses do point back to the primary level, where many teachers have no more than a grade C at GCSE. I am a chief examiner in math and I know what a grade C means. Not very much."

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