

If economists understood cooperation, and the loss and damage from competition, they would no longer teach and preach salvation through competition. They would, instead, lead us into optimization through cooperation.

A school of business has an obligation to prepare students for management in the future. Why should a school of business waste the student's time by teaching him how business is carried on today, and how to swim to the top in the present system? This kind of teaching

will neither help our students in their future careers, nor help our balance of trade. The teaching of statistics should make it possible for students to prepare themselves for the future, not for the past.

There is heavy demand for positions and for consultants that possess the required knowledge. The demand increases, while the supply lags.

The country is being ruined by best efforts, not guided by the theory of management for optimization. There is no substitute for knowledge.

Comment: A U.K. Perspective on Applications in Business and Economic Statistics

Peter G. Moore

THE UK SCENE

Commenting fruitfully on Professor Roberts' interesting paper from a U.K. standpoint makes it necessary to outline the U.K. educational scene, highlighting some of the more important differences between U.K. and U.S. educational policies.

The basic structure of the U.K. system is highly elitist. Only about 15% of children enter tertiary education (mainly at universities or polytechnics), with relatively few staying in full-time education after the minimum school-leaving age of 16. Virtually all boys and girls who stay on at school after the age of 16 and complete their education to age 18 enter tertiary education. This creates a marked schism between leavers at age 16 on the one hand, and the graduates who enjoy full-time education to age 21, or even later, on the other hand. One consequence of the system is a shortage of craftsmen/technicians, so that graduates have to carry out basic industrial tasks that would be done by technicians or craftsmen in other countries.

There is substantial pressure in the U.K. to increase the number of entrants into tertiary education. Achieving this depends critically upon increasing the number of schoolchildren remaining at school after the age of 16, a task that has not yet been energetically tackled. One of the major constraints is the "GCSE" (General Certificate of Secondary Education), and "A" level examination systems, the examinations being

taken at 16 and 18 years old, respectively. Most pupils aim to take five or six GCSE subjects and then, if they continue in education, work for their A levels. These are normally taken in three subjects (occasionally only two and, rarely, four), drawn principally from the subjects studied at GCSE level. These subjects then dictate the programme of studies entered upon at university. Hence, for example, unless the "A" levels include mathematics and physics, it is unlikely that a student could enter university for a degree in engineering, mathematics, physics, etc. This process forces subject choices to be made at around 14 for the GCSE subjects which, in turn, dictate the A level choices. Thus the needs for specialist bachelor degrees are felt right down the educational system as far as the 13 year old.

A recent government-appointed committee on sixth form (i.e., 16–18 year olds) education recommended a change in the A level system to give a broader educational base up to age 18 (say five subjects), a change which was rejected by the government. There is nevertheless a strong feeling, amongst educationalists and employers, that reform along these lines is essential to enlarge the pool of 18 year olds possessing a good quality broad education.

MATHEMATICS VERSUS NUMERACY

In the U.K. literacy has received considerably more attention than numeracy, and indeed is seen to have greater standing. A distinction can be made between mathematics and numeracy. While the amount of mathematics required in those working in business or commerce is relatively modest, unless they are

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