

THE DR. FOX EFFECT

The following is an excerpt of an article “Student Evaluation of Mathematics Teaching” by Professor Gordon Knight, Massey University, New Zealand, as published in a supplement to Newsletter Number 7 of the New Zealand Mathematical Society. This excerpt was subsequently reproduced in the Notes of the Canadian Mathematical Congress [now the Canadian Mathematical Society], Volume 9, No. 4, April, 1977.

In 1973, Naftulin, Ware and Donnelly set up the following hypothesis. Given a sufficiently impressive lecture paradigm, a group of experienced students participating in a new learning situation can feel satisfied that they have learned despite irrelevant, conflicting and meaningless content conveyed by the lecturer.

To test this, the authors selected a professional actor who looked distinguished and sounded authoritative, provided him with a sufficiently ambiguous title, Dr. Myron L. Fox, an authority on the application of mathematics to human behaviour, and wrote for him a paper on *Mathematical Game Theory applied to Medical Education*.

The lecture was presented brilliantly with just the right touch of humour – magnificent use of visual aids – great voice production – the warm smile which made his audience feel he cared.

The content of the lecture was, of course, complete nonsense. It had been carefully written to contain contradictions and other errors of logic and meaningless references to unrelated topics. The question and answer time was similarly contrived.

The lecture was presented three times to different groups of experienced students and each group asked to evaluate it. In each case there were more favourable responses than unfavourable and not one student saw the lecture for what it was.

The implications are obvious. To combat this evidence one might argue that the situation was artificial, that the evaluation was on a single lecture, that the students were not motivated by being tested on the material of the lecture. However, further studies indicate that there is something here. Williams and Ware (1976) used a $3 \times 2 \times 2$ factorial experiment with three levels of content, two of expressiveness of delivery and two of motivation for a lecturer. The difference in motivation was achieved by telling students either before or after the lecture that they were to be tested on the material. The authors report:

‘Are students aware of changes in their knowledge state that result from instruction and do their ratings of instruction reflect such changes? When lectures were delivered in a low-expressive manner, total student satisfaction ratings were significantly lower in low-content than in medium or high-content conditions. However, when the lecture was presented in a high-expressive manner, there was an appreciable difference in satisfaction ratings associated with the amount of content coverage. Just as in a previous study, student ratings of instruction did not reflect coverage or student achievement when the lecture was highly expressive.’

Teaching is a triadic relation in which A teaches B to C where B is some content, skill or disposition. The weakness of student assessment of effective teaching indicated by the Dr. Fox Effect is that it concentrates too much on the relationship between A and C and tends to ignore the important relationships between A and B and between B and C . These missing relationships are indicated by the substantiveness of the lecturer’s teaching and by the increase in student achievement as a result of that teaching.