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FROM FAILURE TO SUCCESS: CHANGING THE EXPERIENCE OF ADULT LEARNERS OF MATHEMATICS

ABSTRACT. For the last few years, the author has been part of a team developing a mathematics course for students most of whom are women, many of whom are black and all of whom are attempting to gain entry to a teacher-training course by successfully completing a one year re-entry course. It is a requirement that teacher-training students should have attained a suitable standard in mathematics. Further Education colleges where re-entry courses are sited have a sad history of student failure in mathematics. The theoretical environment in which the development of this course took place is described in order to place the course in context. In particular, attention is drawn to the re-definition of mathematics which encourages student enquiry and experimentation in order to establish a basis for understanding the subject, and to the teaching/learning model which creates an environment of respect and confidence. The roles of students and staff in a learning environment of this kind are discussed. Particular attention is paid to the attitudes and feelings of the students and the effects on their expectations.

1. BACKGROUND

The project on which this paper reports was devised to support one year return-to-study courses for adults, mostly women many from minority groups. Such courses are known as ‘Access’ courses because they lead directly to particular Higher Education establishments offering specific professional training such as teaching. To gain admission to a Bachelor of Education degree course leading to a qualification to teach, students must have reached a required standard in English and Mathematics. Normally, this is an Ordinary level pass in the General Certificate of Education.

There is evidence that members of the Afro-Caribbean community underachieve in the English educational system and substantial evidence as to the under achievement of women (The Cockcroft Committee, 1982; The Swann Committee, 1983). When performance in Mathematics is assessed, poor achievement and poor motivation appear to be widespread. Thus, the adults presenting themselves as Access students have an educational history of failure in relation to the learning of mathematics but are highly motivated to achieve entry onto the course of their choice. For many past Access students, the mathematics has proved their downfall, confirming previous failure. In January, 1983, the author was asked to collaborate in the planning of a new Access course for entry onto the B.Ed. (primary) and B.Ed. (secondary
Youth and Community Studies) courses at Thames Polytechnic. The associated college was Hackney College of Further Education.¹

2. THEORETICAL CONTEXT

The history of previous failure at mathematics of the students for whom the course was planned, placed them firmly within the reference group of the mathematics anxiety literature. The research interests of the author were in mathematical problem-solving, and the mathematics anxiety literature supports the effects on anxiety reduction of using an investigational, enquiry-based style of teaching (Buerk, 1982; Buxton, 1981). It was conjectured, therefore, that a course which

- capitalised on the adult experience of the students and their motivation,
- offered learning experiences which build confidence and a positive self-image,
- encouraged students to change their perspective on the learning and teaching of mathematics, and
- presented mathematics as an active, enquiry-based subject,

would enable these students to change their image of mathematics and of their own relationship to it. In the process, success should replace failure. There is a symbiotic relationship between the teacher’s image of the subject and the choice of teaching/learning style. Those who subscribe to a view of mathematics as a body of knowledge, algorithmically based and servicing other subjects, not surprisingly tend to choose a prescriptive teaching model in which the main force is on ‘knowing’ and ‘doing’. Equally, a view of mathematics as a pattern-searching discipline, attempting to interpret and describe phenomena using a particular language (for example, of number, space, and especially generalisability) demands an open, questioning, supporting classroom. The distinction that follows between the image of mathematics and teaching/learning model should be seen as a device for clarity and was not reflected in the way in which the course was devised or implemented.

2.1. The Image of Mathematics

The “closed and correct” image which much teaching of mathematics mistakenly gives to learners, encourages a view which is in conflict with the way in which many other subjects are encountered. Where learners find that a personal, interpretative, relativistic approach to other subjects allows them freedom to explore in a manner meaningful to them, they are likely to reject,