

'LEARNING MATHEMATICS IS LIKE ... ' - VIEWS OF TUTORS AND STUDENTS BEGINNING A DISTANCE-TAUGHT UNDERGRADUATE COURSE

Barbara Allen and Christine Shiu

Centre for Mathematics Education
The Open University

Abstract: *Long running distance taught courses often create a community of experience and practice among those who have participated in their presentation. As the **OU** launches new undergraduate courses in entry-level mathematics we ask what factors shape and influence that practice? This report gives a snapshot of work- in-progress on these questions, as offered and discussed at our BSRLM session.*

We have begun our investigation with a questionnaire, versions of which were given to both tutors and students before the first presentation of the new Open University course MST121 Using Mathematics. The questionnaire we designed was sent to 100 students (40 replies) and 156 tutors (25 replies) before they started their undergraduate mathematics course. The students' version of the questionnaire included the following 5 closed-response items.

- *For me the principal attractions to study MST121 were because ...*
- *When] am successful in mathematics, it is because ...*
- *]feel] understand a mathematical topic when ...*
- *When] am unsuccessful in mathematics, it is because ...*
- *Being successful in mathematics is mainly a matter of ...*

The tutors were not asked to answer these directly but were asked to predict the responses given by the students to the above questions.

Analysis of the responses to these questions will be used to paint a broad picture of the student body and to begin to probe how closely this resembles tutor expectations.

We also asked the students and tutors to respond to 5 open-response items. In the case of the tutors the wording of the items was as follows.

- *Mathematics is*
- *] recall vividly a positive experience of mathematics in which*
- *Learning mathematics is like*
- *] expect this course to be different from others I have tutored in that*
- *My greatest concern about tutoring the course is*

Initial analysis of the open-response items took the form of sorting the responses into categories. For most of them reasonably clear and robust categories emerged. However, we

found that the statement *Learning mathematics is like* provoked responses which were difficult to sort consistently. It is possible that the form of this question, which can be read as inviting simile, analogy or simple comparison, results in a greater variety of responses. Nevertheless we felt there was considerable richness to be found in that variety, and that these responses would repay further study.

At our session, therefore, we invited the small group of people present to sort the responses given by the tutors to the item *Learning mathematics is like* We gave no indication of our own tentative categories as we wished to see what would emerge from spontaneous discussion by informed mathematics educators.

The five attendees divided themselves into a group of two and a group of three. Both groups were given the complete set of 23 (two tutors did not answer this item) responses as listed at the end of this report. As we had anticipated much discussion ensued, and led to two quite distinct lists of categories, which are given below. For completeness we also give the list of categories we had ourselves produced earlier.

BSRLM List 1	BSRLM List 2
physical mental/cognitive creative/aesthetic abstraction/ethereal	hill climbing/effort/arriving skills effort/hard work/groping aesthetic puzzle other
OU List	
struggle leading to success using learned skills patterns the unknown other	

It seems that each version gives us different 'cuts' both on tutors' thinking about learning of mathematics and on what we were asking of them.

We would like to thank the people who helped us during our session by sorting the responses and engaging in a discussion which enabled our perceptions of the responses to become clearer. We would also like to extend an invitation to readers of this report to offer us comments on any of the suggested categorisations, or indeed an alternative list which results from their own sorting.

Tutor responses

Learning mathematics is like learning a universal language of communicating maths ideas. Looking for patterns in everything. T1

Learning mathematics is like hill walking. Sometimes hard slog seeing only the ground immediately in front of feet, sometimes exhilarating broad views, anyone can enjoy it at their own level even if highest peak's beyond reach. Doing a well constructed TMA question like doing a well described climb of known difficulty (could expand greatly on the metaphor). T2

Learning mathematics is like climbing a hill: - hard work where you follow the path you're on - and then the joy and satisfaction of being at the top! T3

Learning mathematics is like the rest of life. We do not now what is around the next comer. Some things come easy, others are more of a struggle. (Am I talking about understanding rather than learning?) Trying to teach maths to others has helped me to gain a better understanding. T4

Learning mathematics is like the structure of an onion - building up layers of techniques and understanding which extend the scope of problems which can be handled. T5

Learning mathematics is like groping around in a dark room and then the light is suddenly turned on. T7

Learning mathematics is like a bottle of good wine - it gets better with age! For me it is like .. a worthwhile use of time unlike learning most other things (say Latin, Geography, ...) T8

Learning mathematics is like developing golf skills (enjoy at a simple level, but strive to do better) developing an appreciation of poetry, music chess - at increasingly sophisticated levels. T9

Learning mathematics is like an exciting journey. T10

Learning mathematics is like solving crosswords - frustrating at times but wholly enjoyable. T11

Learning mathematics is like walking in the Dales - sometimes the going is very uphill but the view from the top (i.e. the achievement of understanding) is wonderful. T12

Learning mathematics is like jumping over lots of hurdles, trying hard to ensure that you have understood the exact definition so that you can go on to use the concept. There are lots of building block. T13

Learning mathematics is like gradually undoing the tangles and mysteries (just at the very edges(with which we are surrounded. T14

Learning mathematics is like learning to ride a bicycle. Once you have understood how to do it it seems so easy and you cannot remember why it was so difficult to learn. It's easy when you know/understand the concepts, principles and techniques. T15

Learning mathematics is like learning music - scales are useful but the excitement comes from playing pieces (solving problems) in the real context. T16

Learning mathematics is like seeing the beauty in patterns. T17

Learning mathematics is like climbing a hill. The higher you get the clearer the view of the surrounding countryside - as you can see more the links and layout and connections become more obvious. T18

Learning mathematics is like a detective novel. T20

Learning mathematics is like hard work, man! T21

Learning mathematics is like one of my basic reasons for breathing. So much to learn, so little time. I want to know more and more ... I just love getting involved in it. T22

Learning mathematics is like driving a car, you are never an expert although you may think you are!
T23

Learning mathematics is like learning any trade. It requires good tuition. T24

Learning mathematics is like nothing else. T25