

Mathematical Literacy – a Lifeline for Many

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Mathematical Literacy was introduced in the FET band at the start of 2006. As expected the new and unfamiliar nature of this learning area has caused a great deal of insecurity for teachers, learners and parents. Following a Marang Centre annual workshop on Mathematical Literacy by Aarnout Brombacher some teachers suggested that Hamsa and I (Mellony) start a mathematical literacy support group where we could engage together on an ongoing basis with some of the issues arising from the implementation. This group has had several meetings where we have discussed the successes and tensions of mathematical literacy. Esmé is one of the teachers we met through this support group and have subsequently been working with and learning from.

The mathematical literacy thrust of the Marang centre is also involved in ongoing research into the implementation of Mathematical Literacy. As part of this research we have gathered a vast range of data about learners' views and experiences of mathematical literacy. Some of this was published in the previous edition of LTM (Graven & Venkatakrishnan, 2006). Following discussions with Esmé on some of the findings from this research (focused intensively in one inner city school in Johannesburg) Esmé decided to use our research questionnaire, focused on learner experiences of mathematical literacy, (see end of this article) to find out more about her learners' experiences. Esmé's findings tell the story of the transformation of math phobic and apathetic learners to learners who confidently tackle mathematical problems with enthusiasm. It is a story that highlights what can be achieved even while there are many other uncertainties and tensions in relation to implementing Mathematical Literacy across the FET band.

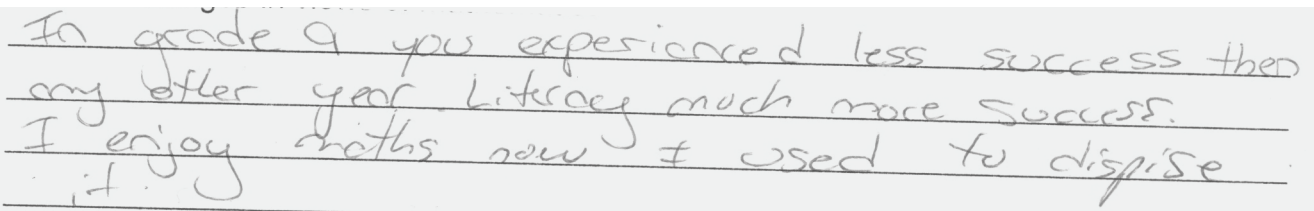
Esmé's school is a private school in the northern suburbs of Johannesburg. At the start of 2006 she had 6 learners in her class; this doubled by the end of the year.

What follows is Esmé's story interspersed with the voices of many of her learners



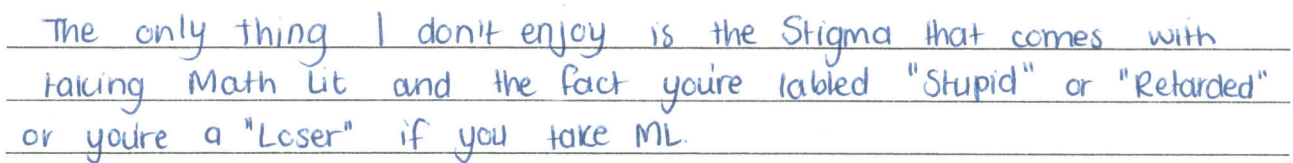
It is so long ago that I struggle to recall a situation where I tried to study something and had been unable to. Teaching Mathematical Literacy reminded me of those days and subsequently I began to identify with my learners. This identification with my own learning experiences helped me to realise that I was dealing with a **whole** group of 'mathematically abused' young adults. These learners seemed to have only experienced failure in a maths class. It appeared that **all** of them landed up in my class because they were unable to take Maths due to their poor Grade 9 results. 75% of these learners found Grade 9 maths difficult and challenging. For many of them Maths was something totally foreign:

In normal maths lessons, I was confused and often didn't know what was going on, and really hated maths



In grade 9 you experienced less success than my other year Literacy much more success. I enjoy maths now I used to despise it.

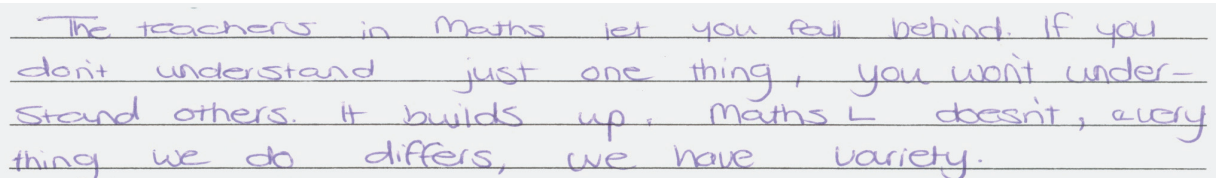
In the first few months of 2006 I had to deal with the major challenge of changing learners' negative perceptions about Mathematical Literacy (which in the beginning they equated with watered down Maths) and their negative perceptions about their ability and interest in doing anything mathematical in nature. I clearly remember the early days - when learners would slink into my classroom with surly looks on their faces, trying to find a place to hide. They were unsuccessful because there were too few of them to go unnoticed. 33% of them felt labelled by their peers in the Mathematics classes and such comments were passed:



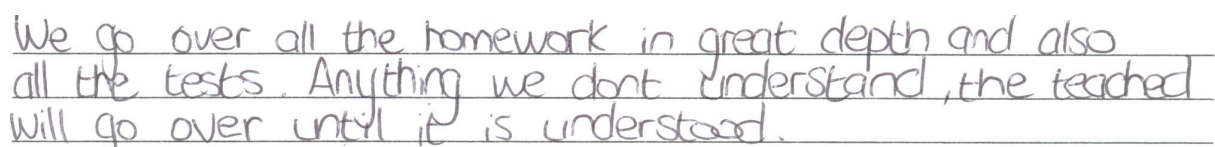
The only thing I don't enjoy is the stigma that comes with taking Math Lit and the fact you're labeled "Stupid" or "Retarded" or you're a "Loser" if you take ML.

As I sit and reflect, I realize that unconsciously, my primary aim, above all others, was to get the learners to start believing in their mathematical ability. No one can reach their potential if they do not feel good about themselves and their ability in a specific environment.

I realized the best strategy for me was to uncover each learner's potential and to negate all previous maths experience, providing each learner with a clean slate on which to build new concepts and constructs. I expressed this view with them in order to create an understanding amongst us to create the potential for future growth. One recollection of mathematical learning enabled in the mathematical literacy environment was the comment, "I never ever understood how to do that but now it makes perfect sense". Initially it was painstaking to encourage the learners to participate in class discussions. I remember asking questions during the lesson, and seeing a sea of anxious faces with invisible signs of "**DON'T** pick ME", clearly imprinted on their foreheads. Eventually a learner put up her hand, but before she gave the answer or I was able to respond, she quickly withdrew her hand saying, "Oh, my answer is probably wrong anyway!" Fortunately within the Maths Literacy classroom there is time to encourage learners. It is through this type of classroom interaction that I have been able to acknowledge both the strengths and areas of difficulty of each learner in my class and see them as unique individuals. What a privilege this has been! We have been able to discuss issues relating to maths like working out a budget on R4 000 a month. Accordingly, we have been able to try and identify with those who are less fortunate than us. The nature of Mathematical Literacy provides the space and time to explore and discuss the issues presented in the different chapters. In addition, many concepts are repeatedly dealt with throughout the year. 75% of the learners felt less pressurised and threatened in this new type of environment. These were some of their comments:



The teachers in Maths let you fall behind. If you don't understand just one thing, you won't understand others. It builds up. Maths L doesn't, every thing we do differs, we have variety.



We go over all the homework in great depth and also all the tests. Anything we don't understand, the teacher will go over until it is understood.

Enthusiastically I observed how they became excited when they understood a concept that had previously caused them much distress. I often wish there was a hidden camera in my classroom to bear witness to the transformations of these learners. Not only are these learners now prepared to venture out of their comfort zone, they are prepared to give an answer or express an opinion. Learners are even entering into debates, yes DEBATE, pertaining to their point of view. They feel free and secure to make a decision or give an opinion. Approximately 80% of them have begun to take tremendous responsibility for their own work by seriously contemplating their answers and making sure they are mathematically sound. If not, the learners have the desire to rework the calculation until they are satisfied with the result. If they need help, they ask - but only after diligently trying to find the mistake themselves. Their attitudes have become more confident and they now believe in themselves as they have found a branch of mathematics which they can understand conceptually and even excel in. The learners now feel that maths has meaning and it helps them in every day situations. One learner worked and reworked the amount of interest paid on a home loan - she thought she had made a grave mistake. Eventually, when she could not find her mistake she asked for help. I assured her the calculations were correct. With eyes as big as saucers she understood the value of “pumping” as much money into your bond as possible.

I believe in Math Literacy our Lessons are very fun and Practical, stuff that we use in every day life.
 In ML we communicate more and enjoy our lessons because we understand more and interact apart from just sitting and staring at our work having no idea whats going on.

I have found maths to be alot easier, it relates to everyday life topics and because you can relate to this, you more keen to do the work

They have blossomed into learners who tackle any task set before them with confidence and courage. They were part of the pilot group writing the IEB final exam. One of the questions was about scale factor, a topic with which we had not dealt. To my utter amazement every learner, without exception, tried this question. To my delight, approximately 33% of them answered it correctly. In fact, none of them even left out an answer. 83% of the learners were either very happy or happy with their test results this year.

Maths Literacy has given these young adults a whole new lease on life. Not only have they realized that this branch of mathematics is very useful, they have come to realize that they are doing a valuable subject that involves complex skills *and* they're *coping*. They have been able to defend themselves, with confidence, when ridiculed by their maths counterparts.

So many times in life those sweet ‘firsts’ have a long lasting affect on us. Personally, I’ll always be able to come back to this hard copy when my spirits need lifting. I have thoroughly enjoyed the year with this dynamic group of learners. I think that this experience has been two fold: the learners have taught me as much about life as I have taught them about maths. As educators, we too have our mountain-top experiences. This is the kind of comment that makes it all worthwhile:

Literacy is the best thing that has happened to me in my entire school career

Like surgeons- we too save lives!

Tell your own story!

We have included the questionnaire and interview schedule on learner experiences below. We encourage all teachers of mathematical literacy to use them, adapt them or design your own questions so as to assist you in reflecting on the experiences of your learners. Furthermore we encourage you to share your findings with us by sending your story to LTM. We acknowledge that stories will differ greatly across the various schools and contrasting contexts in this country but hope that Esme's story has given some inspiration to teachers grappling with this new learning area.

Draft interview schedule for Grade 10 Mathematical Literacy Students

1 Did you 'choose' to take ML? If so, why?

2 What are your experiences of ML so far?

types of activities

topics covered

teaching

level of difficulty

progress in learning

enjoyment

assessment

usefulness

In all these prompts, pick up similarities/ differences with maths

3 What are your expectations for ML in the future – Grades 11/12 and beyond? (Maybe what are you hoping to do after you matriculate?)

4 Are you happy with your choice? (Maybe what do your friends & family think/say about your choice?)

5 If you had to advise a Gr9 learner considering whether to take Maths or ML, what would you say?

Students' Mathematical Literacy Questionnaire, Grade 10

These questions ask you to think about your experiences in mathematical literacy lessons this year. Your responses will remain confidential.

Gender: Male Female

Maths Literacy teacher's name: _____

- 1 Have you found the work in Maths Literacy this year:
 very easy easy about right hard very hard
- 2 In Grade 9 Maths lessons, did you find the work:
 very easy easy about right hard very hard
- 3 Do you enjoy Maths Literacy lessons:
 all the time mostly sometimes never
- 4 In Grade 9, did you enjoy Maths lessons:
 all the time mostly sometimes never
- 5 How happy are you with your progress this year:
 very happy quite happy unhappy very unhappy
- 6 How do you feel about your test marks this year?
 very happy quite happy unhappy very unhappy

Please comment here on your experiences of learning Mathematical Literacy so far this year. You can comment about your lessons, the kinds of topics you have covered, the tests, and whether you are enjoying the subject, or other aspects. Your comments will be kept confidential.

Below, fill in the words or phrases that come to mind under each subject

Maths Literacy	Maths