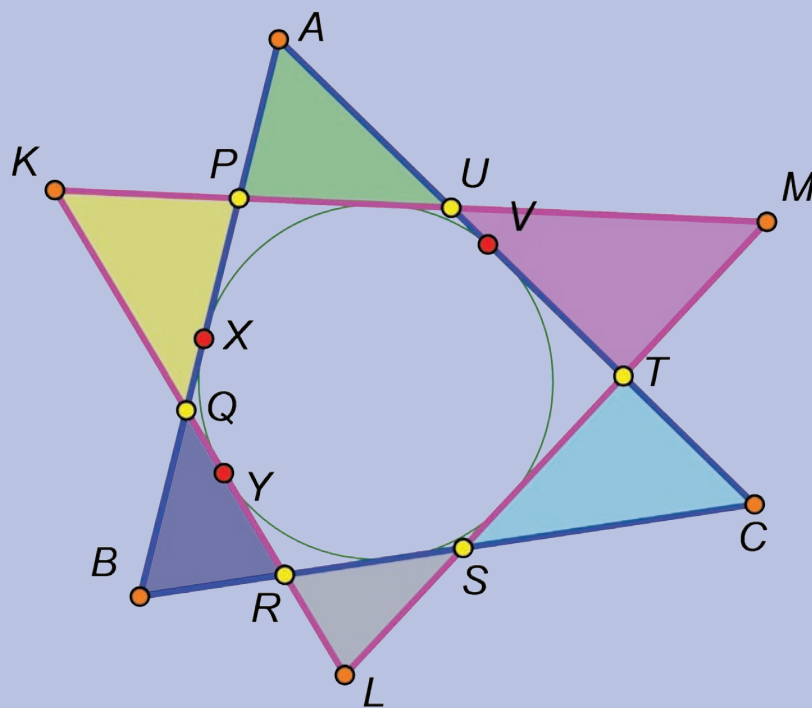


Learning & Teaching Mathematics

A Journal of



Interview with a Mathematics Doodler – Dr Sizwe Mabizela, Deputy Vice Chancellor, Rhodes University

Mellony Graven¹ & Marc Schäfer²

¹SA Numeracy Chair, Rhodes University ²FRF Mathematics Education Chair, Rhodes University

¹m.graven@ru.ac.za ²m.schafer@ru.ac.za



In November 2012 we interviewed Dr Sizwe Mabizela, our Deputy Vice Chancellor at Rhodes University, to find out about his love for mathematics and his enjoyment of “playing” or “doodling” with mathematics and mathematical ideas. Dr Mabizela is a renowned South African mathematician who has a deep concern about the teaching and learning of Mathematics. We were writing a paper (Graven & Schäfer, in press) for a book on mathematics knowledge for teaching entitled “*Exploring Content Knowledge for Teaching Science and Mathematics*” and wanted to make the point that often instilling a playful love of mathematics in learners is absent from the literature. We argue in the paper that a passion for mathematics and embracing a desire to explore and play with mathematics is as essential and important an ingredient for being an effective Mathematics teacher as content knowledge of the subject. We interviewed several of our favourite mathematics educators and asked them about how their love of

mathematics played out in their life and how it all began. We share with you an edited excerpt from our extended interview with Dr Sizwe Mabizela and hope that it serves to inspire.

SIZWE: Doodling with mathematics is one of those things that I do all the time. It’s something that just comes naturally to me and which I really enjoy doing. It’s something that I find very engaging – it’s a pastime for me really.

MARC: What do you do when you play with mathematics?

SIZWE: Usually I’m creating interesting problems in mathematics, or I’ll be working on a research question. I’ve previously done research in functional analysis and there were some very interesting questions which came up from time to time, so when I have the time and space I sometimes re-visit those questions. And since I have the questions in my head wherever I go I often try to play around and see if I can make progress on those problems that I hadn’t managed to completely solve. So it’s just something that I really enjoy doing. It’s a very relaxing thing.

MARC: In what way does it relax you?

SIZWE: I don’t know, it just takes me to a different space. I just enjoy being in that space. I serve on the South African Mathematics Olympiad question committee, and those weekends we get together to formulate problems for the Olympiad are the best times for me – it’s very, very exciting, something that I thoroughly enjoy. Mathematics is something that’s truly amazing because sometimes you try to solve a problem and you don’t really make any headway on it so you just put it aside. And then there’s a period of incubation when nothing seems to be happening at all, but then you are astounded when you return to the problem and suddenly realise that the solution is so simple and straightforward. And when you look at it

afterwards you say ‘of course it had to be!’ I’m often amazed by young people, particularly in the Mathematics Olympiad. I would sometimes take quite a while trying to solve a problem, really writing a very detailed solution to the problem. Then you’d get a young kid in Grade 9 who’d come up with a really clever, very innovative solution. And you say ‘well, that’s the beauty of mathematics!’

MELLONY: Where did your love of mathematics come from? Where did it all start?

SIZWE: That’s always a difficult question to answer because for as long as I can remember I’ve always enjoyed mathematics. It came very naturally. My mother always encouraged us to do mathematics, so from that early stage I really enjoyed it. When I was at boarding school I had an exceptional teacher who was a huge inspiration to many of us, and then at university I was taught by the remarkable Terry Marsh. After graduating, and throughout my teaching career at university, I so much wanted to be like him. He was a quintessential gentleman. I can still distinctly remember from my first year at university how he wrote those integrals and derivatives, the way they were laid out in a very systematic way. He had a huge influence on me in terms of my enjoying mathematics. So I always make the point that one can never over-emphasize the importance of having a good teacher, a caring teacher. So going back to the question you asked, I’ve always enjoyed mathematics.

MELLONY: In your teaching career, when you were teaching mathematics, how do you think this passion for mathematics manifested itself?

SIZWE: One thing that I tried to do was to connect with the students and to make them realise that mathematics is something that they could do. I’m not one of those people who believe that there are certain people who are cut out for mathematics and that there are those who aren’t. I know that there are issues of potential, aptitude and all that, but I still believe that everyone can develop a love and appreciation for mathematics. So I try to connect with the students. I think students are very perceptive – they can sense when you are genuinely enthusiastic and when you enjoy what you are doing. I can say that I really started knowing mathematics when I had to teach it. Although it all came relatively effortlessly to me when I was a student, when I had to explain it to my students it was a totally different ball-game. One of the beautiful things about mathematics is that it works on definitions, and students need to clearly understand these definitions. And that’s really what the beauty of mathematics is, because you can’t simply call on an authority and say ‘so-and-so said it, therefore it must be’. You need to be able to argue logically and coherently, using all the key things in mathematics to make your case. There is no authority except a valid mathematical proof, and I think that for me this is very important. So one of the things I’ve learnt from mathematics is this logical, systematic and critical way of thinking. In anything that I do I always try to separate the issues in order to see what is important and what is not important in terms of understanding the problem and working towards a solution.

MARC: Mathematical playfulness is clearly important in your life, perhaps as much as formal mathematical engagement. How do you marry these two aspects of mathematics, and how would you encourage or inspire children to play more with mathematics?

SIZWE: Informal interaction with mathematics and just being comfortable exploring mathematical ideas in a casual way is important. However, I don’t really make any distinction between informal and formal mathematics. For me mathematics is mathematics, wherever it is, it’s just a continuum. It’s part of me.

MARC: You’ve mentioned that mathematics generally came very easily and naturally to you. But what about those children or individuals who struggle with maths? How would you encourage them to play with maths or to engage with maths in a playful manner?

SIZWE: You have to start with where they are at, and this is where issues of ontological assumptions come into play. The first thing you have to understand is where they are in terms of their own development and appreciation of mathematics, and gradually nurture them through encouragement and reinforcement. It’s important to affirm what learners know because we acquire new knowledge by relating new things to what already exists in our knowledge schema. So, in the first instance one should affirm what learners already