

AMESA KZN REGIONAL CONFERENCE 2013

Mathematics: Teaching for Understanding



Mathematics has been and will continue to be the focus of concern in South Africa and throughout the world. But despite the efforts of various stakeholders, we are still not achieving the results we expect. Countries with smaller education budgets are still achieving greater success in school mathematics and it is time that we begin to ask ourselves serious questions. What are we doing right thus far? What do we still need to improve? Perhaps it is only through concerted effort and dedication that we will begin to show some improvement.

The KZN provincial committee of AMESA invites you to their annual one day conference. We are hoping that through delegates' interaction with other researchers we will begin to understand some of the problems that beset our education system. Our conference theme is aptly titled **Mathematics: Teaching for Understanding**. The conference will cater for primary and secondary school teachers and will showcase current research being conducted in South Africa.

Anyone wanting to present at the conference should send a one page abstract to Dr Vimolan Mudaly by 5 July 2013.

KZN AMESA Executive Committee

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Conference Chair: Busisiwe Goba
gobab@ukzn.ac.za
(031) 260 7607

DATE: 20 July 2013

**VENUE: UNIVERSITY OF KWAZULU-NATAL
EDGEWOOD CAMPUS
PINETOWN**

TIME: 08:00—15:30

REGISTRATION: 07:30

Academic Programme Director: Dr Vimolan Mudaly
mudalyv@ukzn.ac.za
(031) 260 3682

PROGRAMME

Registration and Tea: 08:00 – 08:30

Welcome: 08:30 – 08:40 (LT 6)

eThekwini presentation: 08:40 – 08:55

Setting the scene and announcements: 05:55 – 09:00

Parallel session 1: 09:00 – 12:00 [Please note the names in bold are the Chairpersons of the session]

	LT 2	LT 3	G205	LT6	LAN 5
09:30– 10:00	5 Sally Hobden Letting go and getting learners to take responsibility	7 Jared Govender Technology beyond than merely a teaching tool	Talitha Moore Sharp calculators		
10:00– 10:30		11 Rajen Debba An investigation of aspects of a Mathematics Literacy preliminary paper through an application of Rasch measurement theory.			
10:30– 11:00	9 Rakesh Singh School–Based Assessment (SBA) – Unravelling the truths about SBA.	6 Sikhumbuzo Sithembiso Dhlamini An investigation of the approaches used by mathematics and mathematical literacy learners to solve start-unknown and result-unknown problems	10 Jayaluxmi Naidoo The teaching and learning of mathematics using innovative strategies	1 Prof Poobhalan Pillay Learning to teach geometry	2 Michael De Villiers Doing Geometry on the internet
11:00– 11:30			4 Thelma Rosenberg Games workshop with primary school teachers		
11:30– 12:00	8 Sipho Mbonambi & Sarah Bansilal An investigation of the approaches used by mathematics and mathematical literacy learners to solve start-unknown and result-unknown problems	3 Lauren Izaaks Making statistics easy using a CASIO calculator			
12:00– 12:30					

Lunch: 12:30 – 13:30 (Please return immediately to the venue LT 6 – same as the mornings venue)

AGM: 13:30 – 15:00

Prizegiving at 15:00

Workshops

1. Learning to teach geometry

Prof P Pillay

Similar triangles will be introduced after a short discussion on ratio and proportion. Ideas on “How to teach it” will be proposed. The major thrust of the presentation will be on problem solving. The audience will work in groups, on worksheets, and will be assisted by the presented and some experienced teachers.

2. Doing geometry on the internet

Prof Michael de Villiers

This hands-on workshop will provide participants with some internet activities they could do with their learners. It is based on the Van Hiele theory of learning and we will look be investigating quadrilaterals in the following phases: 1) visualization 2) exploring properties 3) constructing quadrilaterals, and 4) defining quadrilaterals.

Animation and dragging features of the software assist learners to seeing relationships between classes of figures by dragging them into special cases, to make and verify conjectures by dragging, discovering and comparing properties, explaining properties using symmetry, until learners are eventually challenged to construct their own dynamic quadrilaterals before finally defining them in different ones, and critically comparing their definitions.

3. Making statistics easy using a CASIO calculator

Lauren Izaaks

Target audience: Grade 10, 11, 12 Maths Educators

In this workshop we will be focusing on statistics. Working with single variable/ data handling and regression analysis/ linear regression. This workshop will be aimed at increasing the knowledge and ability of FET Educators to use the stat function on the Casio Fx82ZA- Plus Calculator. This will enable educators to have a better understanding of the functions and therefore making teaching and learning an easier task. This workshop will be a hands on and interactive session so it is advisable that an Fx82ZA- Plus Calculator is brought to the session.

4. Games workshop with primary school teachers

Thelma Rosenberg

In this workshop, teachers will be shown examples of whole class and group games that they could use and/or adapt. These are games used in lectures with pre-service primary school teachers to prepare them for having resources available for “warm-up” /consolidation / extension activities with primary school learners. The presenters are looking forward to practicing teachers’ /teacher educators’ input of how the games have been /could be used in their own teaching.

Papers

5. Letting go and getting learners to take responsibility

Sally Hobden

Many teachers complain that the learners do not seem to make any personal effort to improve their marks. Teachers are familiar with learners who claim not to understand “all of trigonometry” or ”all of graphs” .Learners appear to think that the solution to their Maths problems lies outside themselves - the teacher must explain again or they must go for extra tuition. Research has shown that learners who are self motivated and conscious of their own learning behaviour perform better.

In this talk I will demonstrate the use of learning journals to track own progress, and provide some ideas to help learners in this task. We, as teachers, have to let go of the idea that we are the only source of knowledge and encourage learners to see themselves as capable of independently learning the maths . This is promoted when learners have an overview of the entire curriculum and can track their progress through the sections, and identify their own specific problems.

6. An investigation into Grade 12 teacher’s understanding of Euclidean Geometry

Sikhumbuzo Sithembiso Dhlamini

The main focus of the research was to investigate the understanding of Euclidean Geometry of a group of Grade 12 mathematics teachers, who have been teaching Grade 12 mathematics for ten years or more. The theoretical framework of this research is based on Bloom’s Taxonomy of learning domains and the Van Hiele theory of understanding Euclidean Geometry. The research was structured around the following questions:

1. What are the general Bloom’s Taxonomy learning domains and Van Hiele levels of understanding of Euclidean Geometry of a sample of Grade 12 mathematics teachers?
2. What are Grade 12 mathematics teachers’ specific conceptions and misconceptions with respect to circle geometry?

In this investigation, the method employed in completing the study is the qualitative research method. The researcher collected the data by giving participants a test to write. To supplement the information gathered from the test, participants were also given a task-based interview. The sample size was ten teachers.

The coding system was utilised to develop categories and identify patterns among the categories of teachers’ responses. The researcher transcribed the responses of the interviews verbatim. The data revealed that the majority of teachers did not possess Subject Matter Knowledge (SMK) of Bloom’s Taxonomy categories 3 through 5 and the Van Hiele levels 3 through 4 to understand circle geometry, predominantly those that are not typical textbook exercises yet still within the parameters of the school curriculum. Teachers of mathematics, as key elements in the assuring of quality in mathematics education, should possess an adequate knowledge of subject matter beyond the scope of the secondary school curriculum.

7. Technology beyond a teaching tool

Jared Govender

Throughout history there have been many important advances, both physically and mentally, which have changed the way we think. Should we always accept things as they are or should we extend our bounds of knowledge? It is thus important to take note of the way we present and deliver our lessons. In this session we will explore the limits of parallel lines and the tech approach to teaching trigonometry with the aid of dynamic technology.

8. An investigation of the approaches used by mathematics and mathematical literacy learners to solve start-unknown and result-unknown problems

Sipho Mbonambi and Sarah Bansilal

Result-unknown problems and start-unknown problems can be solved using many solution strategies. In this study, we explore the extent to which ML and mathematics grade 11 learners are able to recognise the differences between start-unknown and result-unknown problems based on the same equation, and to actually solve the problem. We presented 305 ML and 105 mathematics grade 11 learners with a same $y = mx + c$ word problem in two forms i.e. start-unknown and result unknown and we analyse and examine whether learners can identify differences between problem formulation i.e. start-unknown and result-unknown, what approaches are used by both groups to solve the problems and that are there differences in trends of the approaches favoured by the two groups?

9. School-Based Assessment (SBA) – Unravelling the truths about SBA.

Rakesh Singh

Often I hear colleagues and learners allege that SBA are a futile exercise as the marks were not utilised in the calculation of the learner's final mark at the end of grade 12. The truth is that there is an SBA mark that is added to the final mark, but this may not be the mark that the school had generated. SBA ought to form an integral component in the calculation of the learner's final mark at the end of grade 12 as envisaged in the education curriculum documents. Though this mark ought to constitute 25% of the learner's final mark, in reality it basically constitutes approximately 1,25% of the learners final mark. Many schools' SBA marks were rejected as there was a variance of more than 10% from the learners final adjusted examination mark. This could be due to varying standards in the compilation of the assessment tasks. From my anecdotal experience as a national quality assurer I found that the quality of tasks ranged from good to very weak. It was found that some educators merely cut and pasted previous year's papers and gave these as informal assessments. It was also found that some of the tasks were highly theoretical and served no real purpose in improving academic prowess. While others had good contexts and questions, it was riddled with mathematical errors and incorrect questioning technique. Also the memoranda were found to contain many errors. There was no evidence present that these informal assessment tasks actually underwent any form of moderation processes as the informal assessments do. Furthermore, the debate about standardising assessment tasks across a cluster or region still rages on. The standardisation of tasks does have pros and cons. The advantage being we will have a common instrument that could be used to assess these tasks and the major disadvantage is that we end up stifling those educators who are creative and innovative. However, what proved to be beneficial during the quality assurance process that those schools that had common assessment tasks, mainly the formal tasks, tended to have fewer problems relating to errors and the marking instrument used.

10. The teaching and learning of mathematics using innovative strategies

Jayaluxmi Naidoo

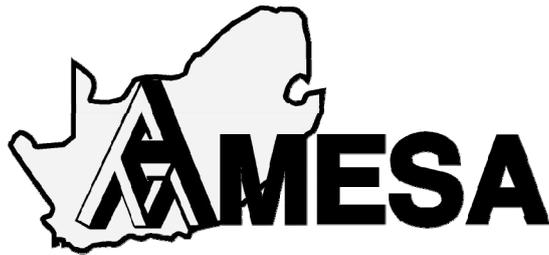
There is a global concern about the poor performance of learners in mathematics. Mathematics today has a massive impact on science and society. Mathematics underpins social development and the global economy at every level; its language is universal and mathematics plays an important role in one's personal and work life. Unless major changes in mathematics education are made, our future economic prosperity is at risk. Thus, if teachers both nationally and internationally are aware of innovative strategies that influence the teaching and learning of mathematics this may result in teachers making a concerted effort to change or adjust their teaching strategies globally. This concerted effort by teachers globally, may have a positive effect on mathematics results of learners. The purpose of this presentation is to demonstrate how mathematics teachers used innovative strategies in the teaching of mathematics. Data was collected from a convenience sample of teachers teaching at different schools in KwaZulu-Natal, South Africa. A key finding of this study exhibited that the use of these innovative strategies was essential for the effective teaching and learning of mathematics.

11. An investigation of aspects of a Mathematics Literacy preliminary paper through an application of Rasch measurement theory.

Rajen Debba

This study supplements the qualitative investigation of the 2009 preliminary examination written by matric pupils in a KwaZulu-Natal (KZN) high school (Debba, 2012) with an application of Rasch measurement theory (RMT). An assumption underlying RMT is that underpinning any assessment procedure there exists a somewhat unidimensional construct (in this case mathematical literacy) that may be gauged along a continuum indicating more or less proficiency of the construct (in the case of learners) and more or less difficulty of the construct (in the case of items). Checks are made on the test as a whole, the items, and the learner responses, to ensure fairness of the instrument for the particular reference group, in this case a group of mathematical literacy students in a KZN high school.

This article focuses on the scoring of polytomous items. For some items it was found that the scoring allocation unduly advantaged some learners and disadvantaged others. Through the qualitative investigation of the item and the associated scoring logic, and the results of the Rasch analysis, rescoring was investigated. This article reports on the overall result prior to rescoring, the analysis and rescoring of the items, and the post rescore analysis. The purpose of the paper is firstly to illustrate the importance of appropriate scoring in the interests of fairness and secondly to show how an application of the Rasch model enables one to check validity of assessments and to verify adjustments where required.



AMESA KZN REGIONAL CONFERENCE 2013
 University of KwaZulu-Natal (Edgewood Campus)
 Pinetown

Date: 20 July 2013

REGISTRATION FORM

DELEGATE DETAILS								
Name							Title	
Surname				Name to appear on badge				
Indicate status:	Academic / Practitioner	Yes	No	Student	Yes	No	Student No.	
Are you a member of AMESA in 2013?	If 'YES' indicate your membership number:							
Institution								
Postal Address								
City						Postal Code		
Tel				Fax				
Cell Number				E-Mail				

REGISTRATION: <i>includes registration fee and AMESA membership for non-members, teas/coffees, and lunch.</i> Please indicate (*) in relevant box	
Registration – by Tuesday 16 July 2013	
Registration Fee – AMESA member (2013)	R30.00
Registration Fee – AMESA Non –member (including membership fee for 2013)	R150.00

NB! Payment of the registration fee will be done on the day of the conference.

MEMORABILIA: <i>Limited number of t-shirts will be sold on the day of the conference. Please indicate the preferred size (*)</i>					
T shirt @ R 70.00	S	M	L	XL	XXL

NB: On completion of this form, please submit to gobab@ukzn.ac.za, mudalyv@ukzn.ac.za, sthekhanyile6@gmail.com, shanbasg@discoverymail.co.za or fax to (031) 260 3697

KZN REGIONAL COMMITTEES AND STRUCTURES

EXECUTIVE COMMITTEE (Elected Nov 2011-2013)

Executive	Name & Surname	Cell number	Email Address	School Name	Work Telephone
Chairperson	Busisiwe Goba	0738483377	gobab@ukzn.ac.za	UKZN	031 2607607
Vice Chairperson	Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE	039 6823577
Secretary	Shanba Govender	0835765858	shanbasg@discoverymail.co.za	Austerville Primary	031 4612093
Treasurer	Dory Reddy	0837761515	dory@eject.co.za	Casio/ Chatsworth Child & Family Welfare	031 4031256

BRANCH CHAIRPERSONS

Chairperson	Name & Surname	Cell number	Email Address	School Name	Work Telephone
Durban Central	Daniel Krupanandan	0835603126	danrow@mweb.co.za	DoBE	031 3272534
Durban South	Harry Govender	0837127767	harrysg@telkomsa.net	Wyebank Secondary	031 7110401
Empangeni	Thembelihle Madondo	0834371442	Thembelihle.Madondo@kzndoe.gov.za	DoBE	
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Maphumulo	Thulani Dela	0847055007	thulanidela@24.com	Ukukhanyakwezwe	
Mid-South Coast	R.Ramsugit	0846031345	rramsugit@gmail.com	Umzinto Secondary	
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Othukela	Mdu Zwane	072 214 5354	zwanne@telkomsa.net	DoBE	
Pietermaritzburg	David Maistry	0832319731	dmaistry@webmail.co.za	Rosethorpe sec	
Sisonke	Muzondo Frankson	0780562655	frankzondo@gmail.com	Dingeka Technical College	
Umlazi-Umbumbulu	Sthe Madonsela	0823265462	Langa.madonsela@gmail.com	Makhumbuza High School	031 9069194

PROBLEM SOLVING COMMITTEE

Branch	Name & Surname	Cell number	Email Address	School Name	Work Telephone
Regional level	Tyger Yegambaram (Chair)	0832965632	tygerpy@gmail.com	Lotusville Primary	032 5332607
	Thembelihle Madondo	0834371442	Thembelihle.Madondo@kzndoe.gov.za	DoBE	
	Sthembiso Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE	039 6823577
	Siphiwe Msimango	0733658286	cpwemcmango@gmail.com	Umkhumbi Secondary	
	Logie Baskali	0837781132	baskali@telkomsa.net	Parlock Primary	031 5771863

Contact branch chairpersons for the branch representative on this committee

CURRICULUM COMMITTEE

Phase	Name & Surname	Cell number	Email Address	School Name	Work Telephone
Intermediate	Logie Baskali (Chair)	0837781132	baskali@telkomsa.net	Parlock Primary	031 5771863
Senior	Mdu Zwane	072 214 5354	zwanne@telkomsa.net	DoBE	
Foundation	Shanba Govender	0835765858	shanbasg@discoverymail.co.za	Austerville Primary	031 4612093
FET	Sthe Khanyile	0833299318	Sthe.khanyile@yahoo.com	DoBE	039 6823577

Contact branch chairpersons for the branch representative on this committee



AMESA KZN 2013 Election Nomination Form

Section 1 --- to be completed by *nominators* ---

We (Branch / Members) nominate _____ for the position of

_____.

Nominators:

Member 1 / Branch (print)	AMESA Membership number	Signature
Member 2 / Branch (print)	AMESA Membership number	Signature
Member 3 / Branch (print)	AMESA Membership number	Signature
Member 4 / Branch (print)	AMESA Membership number	Signature

Date	Address (branch/ one member)
Fax	Email Address

Section 2 --- to be completed by *nominee* ---

I, _____ (full name), accept this nomination.

Nominee's Profile (max. 50 words, may also be sent by email to election chairperson):

Nominee:

Full Name (print)	Signature
Date	AMESA Membership number
Email	Address
Fax	Address

Instructions

Any two AMESA KZN members or a branch can nominate AMESA regular member and all nominations must be made in writing to the AMESA KZN Executive committee. The nominations are for the office bearers (Chairperson, Vice Chairperson, Secretary and Treasurer).

Section 1: Must be filled out by the nominators (two members or a branch) and provide their contact information and 2013 membership number. Nominations by a branch must be signed by at least four members of the branch committee. The nominators should provide the name and office that the nominee is running for.

Section 2: Must be filled out by the nominee and provide their contact information and 2013 membership. The nominee is the person that is running for office.

This form must be emailed by 18 July, 2013 at the addresses below. Receipt will be acknowledged by email as soon as possible. If you have any questions, please contact the AMESA KZN Executive committee.

**NB: For nominations made by a Branch – 4 nominators are required.
For nominations by other AMESA members only 2 nominators are required.**

Election Chair

Busi Goba	031 260 7607	Gobab@ukzn.ac.za
Shanba Govender	031 4612093	shanbasg@discoverymail.co.za
Sthembiso Khanyile	039 682 3577	sthekhanyile6@gmail.com
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