



**26TH ANNUAL CONFERENCE OF THE
SOUTHERN AFRICAN ASSOCIATION FOR RESEARCH IN MATHEMATICS, SCIENCE AND TECHNOLOGY
EDUCATION**

Conference Theme:

Pursuing sustainable and inclusive quality education through research informed practice in Mathematics, Science and Technology

**16 JANUARY – 19 JANUARY 2018
Hosted by University of Botswana
Gaborone, Botswana**



THANK YOU

The SAARMSTE Executive Committee would like to thank the following sponsors for continued support over the years for SAARMSTE activities. The sponsors make it possible for SAARMSTE to sustain the development of Mathematics, Science and Technology Researchers in Southern Africa:



PLENARY SPEAKERS 2018, SAARMSTE CONFERENCE, UNIVERSITY OF BOTSWANA

- **Professor Dame Celia Hoyles**, UCL Institute of Education, University College London, U.K
- **Professor Kgomotso Garegae**, University of Botswana, Botswana

- **Professor Merrilyn Goos**, University of Limerick, Ireland
- **Professor Fred Lubben**, University of York, U.K.

CELIA HOYLES



Short Biography: Professor Dame Celia Hoyles, D.B.E, O.B.E, PhD, M.Ed, BSc. (Hons), CMath, Professor of Mathematics Education, UCL Institute of Education, University College London, U.K

Celia was awarded a first class honours degree in mathematics from the University of Manchester and holds a masters and doctorate in mathematics education. She taught mathematics in London schools from the late 60s before moving into higher education. She was inspired by the vision of using digital technology to open access to mathematics and has led many research and development projects to promote this aim. Her main research is building research-informed curriculum interventions embedding digital technology that enhance mathematical learning for all age groups. Other research includes secondary students' conceptions of proof, the mathematical skills needed in modern workplaces, evidence-informed mathematics policy,

and effective continuing professional development and learning for mathematics teachers.

She has published widely and worked constantly to change the public face of mathematics, initially by co-presenting a popular TV mathematics quiz show, Fun and Games, which topped the prime-time ratings between 1987 and 1990. Celia was the first recipient of the International Commission of Mathematics Instruction (ICMI) Hans Freudenthal medal in 2004, and of the Royal Society Kavli Education Medal in 2011 both for her research work. She was the UK Government's Chief Adviser for mathematics (2004- 07), and the director of the National Centre for Excellence in the Teaching of Mathematics (2007-13). She was President of the Institute of Mathematics and its Applications (IMA) (2014-15), the professional and learned society for qualified and practising mathematicians. Celia was made an Officer of the Order of the British Empire in 2004 and a Dame Commander in 2014. In 2016, she was selected for the Suffrage Science award for Communications to acknowledge her scientific achievements and ability to inspire others.

Plenary Address Abstract: Exploiting digital technologies for inclusive mathematics learning

A key challenge for task design in mathematics education and in STEM education more generally, is to design to enhance engagement with mathematics for all. One way to achieve this is to exploit digital technology to reveal more of what mathematics actually is; first, by offering a glimpse of the mathematical models underlying a given (and carefully chosen) phenomenon; and second, by fostering an approach to mathematical tasks that

transcends the purely procedural. In this talk I will describe in this paper how we have attempted to address these challenges in two research projects in England.

Workshop Topic: Blending computational and mathematical thinking in primary education

(together with Prof Richard Noss, UCL Knowledge Lab)

In this hands-on workshop, we will present an overview and the aims of the 2-year ScratchMaths intervention for 9-11 year old pupils. The ScratchMaths Project aims to promote mathematical thinking through carefully designed programming activities supported by teacher professional guidance and professional development. Participants need not have any prior experience of Scratch, They will work in pairs on some selected projects and share the outcomes in terms of mathematics and computational challenge and learning.

(Please bring a laptop to this workshop or share with a partner)

KGOMOTSO GERTRUDE GAREGAE



Short Biography - Kgomotso Gertrude Garegae is an Associate Professor in the field of Mathematics Education and Head of the Department of Mathematics and Science Education (DMSE) at the University of Botswana. She obtained her PhD from the University of Manitoba, Canada. She is currently a member of AMU Commission of Women in Mathematics and participates in many committees dealing with the development of mathematics education in the country. She played an instrumental role in the preparation of the winning bid that brought the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SEACMEQ) Coordinating Centre (SCC) from Paris to Africa, the University of Botswana, in 2014. She led a team of researchers in a benchmarking trip to USA, UK and South Africa with the aim of improving the uptake of mathematics, science and technology in Botswana. Her sustained interest in equity issues and inclusiveness in mathematics education has opened another perspective of affective domain realising how its negligence has to a certain extent failed teacher education.

Plenary Address Abstract: Pursuing sustainable and inclusive quality STEM education through research informed practice in Southern Africa: An introspection

The fourth sustainable development goal (SDG4) encourages countries globally to “ensure inclusive and quality education for all children and promote lifelong learning” among youth and adults. This plenary intends to raise questions as to how far African countries are realising or preparing to realise this goal. In particular, the presentation aims at stimulating minds to think about the impact and types of research that we usually engage in by taking an introspection of STEM studies in Southern Africa in relation to the theme of the conference—*Pursuing sustainable and inclusive quality education through research informed practice*. The research articles were categorised into (i) teaching, (ii) tools for teaching and (iii) learning, environments for teaching and learning. Inclusive of the discussion will be the role of African universities pertaining to sustainable quality education.

Workshop Topic: Gender issues in mathematics performance overturned: A potential window to understanding gender-biased classroom practices (together with Dr Sesutho Kesianye, University of Botswana)

Inclusion and equity in and through education is the cornerstone of a transformative education agenda... No education target should be considered met unless, met by all (Education 2030, page 7).

Over the past 4 decades the girl-child's underrepresentation in the STEM disciplines have been blamed on several factors including cultural practices that preferred the boy child for economic gains, the aggressive classroom interactions dominated by the boys, poor performance and stereotypical depiction of women in textbooks and other educational materials. Furthermore, after school time is not used equitably in that the girl child would engage in home chores while the boy child has more time to study, thus causing the girl child to lag behind.

However, current data show a reversed trend in girls' performance. It is reported that recently girls have, in the midst of a continued aggressive learning environment and unfavorable cultural practices, begun to outperform boys in local, regional and international assessments. What could have happened? Could it be possible that gender issues ebb and flow with a political currency that is reinforced by positive behavior? What behaviors do teachers adopt (do, say or act), that propel girls to perform well in mathematics? What activities do teachers engage in that seem to minimize gender bias in teaching environments? Or could it be a reverse bias against boys?

This workshop will give teacher educators and classroom practitioners an opportunity to reflect and/or explore the teacher and his/her classroom conduct in an attempt to address the question: *What instructional practices do teachers engage in to discourage boys from doing well in mathematics as they used to?* The understanding of such practices may be a long sought out answer to the issue of gender disparity in STEM disciplines.

MERRILYN GOOS



Short Biography: **Marilyn Goos** is Professor of STEM Education and Director of EPI*STEM, the National Centre for STEM Education, at the University of Limerick, Ireland. Before taking up this position she worked for 25 years at The University of Queensland, Australia, in a range of academic roles including Head of the School of Education and Director of the University's Teaching and Educational Development Institute, working with all Faculties and disciplines to improve the quality of teaching and learning in the University. She is an internationally recognized mathematics educator whose research is known for its theoretical innovation and strong focus on classroom practice. Her research interests have included students' mathematical thinking, the impact of digital technologies on mathematics learning and teaching, the professional preparation and development of mathematics teachers, numeracy across the curriculum, curriculum and assessment reform, and teaching and learning in higher education. She is currently Editor-in-Chief of *Educational Studies in Mathematics*, one of the leading research journals in mathematics education, and Vice-President of the International

Commission on Mathematical Instruction. She has won an Australian Award for University Teaching for her work as a mathematics teacher educator, and a Mathematics Education Research Group of Australasia Award for Outstanding Contribution to Mathematics Education Research.

Plenary Address Abstract: Sustaining and Scaling Up Research-Based Professional Learning for Mathematics Teachers

Education research journals regularly report on small-scale studies that have been successful in changing mathematics teachers' classroom practices. But it is rare to find large-scale transfer of research knowledge into practice in mathematics education. This presentation describes a research-informed, large-scale professional development project initiated by a state education system in Australia that now involves a large number of schools and teachers. The project developed a cluster model for bringing together primary and secondary school teachers to build their curriculum knowledge, confidence, and enthusiasm for teaching mathematics. The research study aimed to identify factors that contribute to the sustainability and scaling up of this initiative. Drawing mainly on interviews with 61 participants – teachers, school curriculum leaders, principals, and regional education leaders – the study identified factors related to professional development content, collective action, and leadership at the school and regional levels. The findings contribute to the literature on mathematics education reform and identify implications for supporting teachers and schools in this enterprise.

Workshop Topic: Mathematical Knowledge for Teaching: What Do Teachers Need?

Internationally, there is a great deal of interest in describing and measuring the kinds of mathematical knowledge needed to teach mathematics effectively in primary and secondary schools. This workshop provides an opportunity for mathematics educators to consider the nature of mathematical knowledge needed by beginning teachers of mathematics. It is informed by a national project involving seven Australian universities that offer pre-service teacher education programs. The aim of the project was to improve the quality of university-based pre-service teacher education in mathematics.

Online questionnaires were devised to measure two types of knowledge needed for effective teaching of mathematics: mathematical content knowledge and pedagogical content knowledge. The latter type of knowledge is important because it enables teachers of mathematics to recognise student ways of thinking, address student misconceptions about a mathematical concept, identify aspects of a mathematical task that affect its complexity, select appropriate representations of concepts, use a variety of examples and resources, and explain how mathematical topics fit into the curriculum.

The workshop will explain the process of creating multiple choice questionnaire items that aim to measure mathematical content knowledge and pedagogical content knowledge for teaching primary and secondary school mathematics. It will invite discussion of alternative responses to selected items, share questionnaire data from pre-service teachers, and ask participants to create new questionnaire items that probe mathematical knowledge for teaching in primary and secondary schools.

FRED LUBBEN

Short Biography: Things you may not know about me: I am a trained Civil Engineer up to Masters level, specialised in Drinkwater and Sewerage treatment, an interest directly related to Rachel Carson's environmental science book 'Silent Spring' published in the 1960s. I never practiced as a civil engineer, but kept the engineering mindset and the concern about environmental sustainability. After discovering that I am more interested in working with people than with constructions, I trained as a teacher: in mathematics, physics and technical drawing. It kept me out of conscription in the Netherlands by allowing me to teach in secondary schools in Zambia, then in Ghana, the Netherlands, the UK and Swaziland. The LoLT was never my mother tongue, and seldom that of the learners. My passion was in-service teacher development (in Namibia and Swaziland) – I was a practitioner in a professional learning community. And then came research training in York, UK, and my life as researcher (not a lecturer): based in York, UK, but researching mainly



developing country contexts adding Trinidad and Zimbabwe to the countries I had previously practiced in. My research foci include context-based science teaching (a major focus in York, but also in Swaziland and Trinidad); the role of practical work (in the UK, and in Namibia, South Africa and Swaziland); science teacher professional development (South Africa, Swaziland, UK and Zimbabwe); and sustainable development in learning science and technology (Netherlands, Swaziland and the UK). It resulted in over 70 journal and book chapter publications with more than 3200 citations. Over the last eight years I have been chief-editor of the African Journal of Research in Mathematics, Science and Technology Education (AJRMSTE) the research journal of SAARMSTE, and I love being a member of this professional learning community.

Plenary Address Abstract: A review of science education research in South Africa 2007-2016: Any pointers for STEM Education?

The presentation reports on a review of 10 years (2007-2016) of research in science education in South Africa. Comparisons will be made with the previous review (2000-2006) of science education research in the country published in AJRMSTE in 2009, and with the parallel review (2007-2015) of research in mathematics education reported early 2017 in AJRMSTE, to identify trends in the characteristics of contributing authors, the use of research outlets, research methodologies, research foci and local and international uptake. Several interpretations of the notion of STEM Education will be presented and the identified research foci in the review will be interrogated for contributions to each of the interpretations of STEM Education. Opportunities for further STEM Education focused research will be suggested.

Workshop Topic: Getting your science education research published in Africa and beyond

The workshop is experiential and will provide hints and suggestions on ways of structuring a research paper, including differences between research papers, extended abstracts, reports and theses; aspects reviewers will be looking for; ways of improving coherence within the paper; ways of linking with the existing literature; ways of structuring a results section; ways of selecting a target journal, in Africa and beyond. Contributions by participants sharing their experiences of submitting science education papers and dealing with reviews will be very welcome.

SAARMSTE CONFERENCE LOCAL ORGANISING COMMITTEE (LoC) - 2018

Conference Chairperson:	Dr A A Nkhwalume	University of Botswana
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Message from the SAARMSTE President 2018: Lyn Webb

A conference does not just 'happen'... Thank you to the University of Botswana LoC under the chairpersonship of Alex Nkhwalume – and all those unsung heroes who have quietly gone the extra mile to make SAARMSTE 2018 a memorable experience. Thank you to the SAARMSTE Executive Committee for a year of dedicated hard work and friendship.



We are privileged to welcome to Botswana plenary speakers of international renown:

- Celia Hoyles; UCL Knowledge Lab, University College London, United Kingdom;
- Kgomotso Garegae, University of Botswana;
- Merrilyn Goos, University of Limerick, Ireland;
- Fred Lubben, University of York, United Kingdom.

I am sure that we will be enriched by their wisdom and wealth of research experience.

In order to maintain an institutional memory, the SAARMSTE Proceedings for the last 20 years have been saved on to the CASIO memory sticks which have been given to each delegate at the 2018 conference.

This year the Executive has sponsored three emerging researchers to attend the conference in Botswana and Taylor & Francis has provided funds for an award for the best article published in AJRMSTE during 2017 by an early career researcher.

Although this conference is the culmination of months of planning and hard work, the Executive Committee has reached many milestones:

Ken Ngcoza has been a strength, inspiration and support as President Elect this year.

Fred Lubben, Editor of AJRMSTE, has negotiated a very favourable contract with Taylor & Francis going forward. He has also compiled an electronic Special Issue in 2017/18 of the best articles published in AJRMSTE in the last 10 years. Along the way, he continues to regularly orchestrate Writing Workshops during the year and has coached developing researchers into becoming published authors.

Hamsa Venkat and her Research Capacity Building Committee worked with Washington Dudu and Percy Sepeng from North-West University to arrange another inspiring Research School in North West Province mid-year. Merrilyn Goos and Frackson Mumba participated as expert international facilitators. Doctoral researchers continue to offer very positive evaluations of the Research School, with many returning as graduate alumni– a fitting tribute to the developmental and collegial environment that has been built and sustained over time.

Tulsi Morar has kept SAARMSTE finances in check, so that we can celebrate achieving the milestone we set ourselves two years ago. SAARMSTE is becoming self-sustaining...

Mike Mhlolo and Audrey Msimanga keep the Chapters up to date with events and activities. Chapter activities included two well-presented and attended colloquia – Eastern Cape; Annual conference in collaboration with the DBE – North West Province; Involvement in National Assessment Report and Current Trends Research – Mozambique.

Carolyn Stevenson-Milln makes sure the wheels turn smoothly. She has once again run the online paper submission and registration for the conference and deals with queries and requests with a quiet efficiency – and sense of humour.

The theme of this year’s conference: “Pursuing sustainable and inclusive quality education through research informed practice in Mathematics. Science and Technology” underlines the importance of research intertwined with practice. We look forward to discussing, debating and sharing ideas and experiences in the warm and nurturing environment of the SAARMSTE family.

Welcome to beautiful Botswana!

Lyn

Hamsa Venkat Audrey Msimanga Ken Ngcoza



Mike Mhlolo Tulsi Morar Carolyn Stevenson-Milln Fred Lubben

Guidelines for paper submission and presentation at SAARMSTE 2018, University of Botswana

Long paper: Maximum of 6000 words, (including references), for a 30 minute presentation followed by 15 minutes Q&A. Long papers are equivalent to journal publications utilising the same criteria as AJRMSTE articles; and are reviewed accordingly.

In accepting a Long Paper for presentation at the SAARMSTE conference, the Review Panel presumes that:

- 1) The paper is original and has not been published elsewhere;
- 2) Permission will be granted by the author for the accepted long paper to be published in the accredited Book of Proceedings;
- 3) At least one of the authors will register and attend the conference to present the paper;
- 4) First authors may only present one long paper at each conference.

Long papers are fully peer reviewed and thus attract DHET subsidy

Short paper: Maximum of 1500 words, (including references), for a 20 minute presentation followed by 10 minutes Q&A. Short papers should highlight preliminary findings and significance of the research. Short paper submissions could be the first draft of a journal article consisting of: abstract, introduction literature review, methodology, results and conclusions. Authors are encouraged to submit short papers for development of an article at the post conference workshop.

After acceptance of the 1 500 word short paper, authors may elect to develop their research further into a 3 600 word paper which will NOT be reviewed but, after consultation with the editor, could be published in the Book of Short Papers, but will not attract subsidy.

Snapshot paper: Maximum of 1500 words, (including references), for a 10 minute presentation followed by 5 minutes Q&A. Snapshot papers should be based on emerging research, not necessarily with results, but with a framework of: abstract, introduction, literature review, methodology and the way forward.

Symposium / panel paper: Maximum of 1500 words, (including references), for a 90 minute team discussion around issues where different points of view, approaches, debates or analysis of the same problem are presented. The paper should contain details of each speaker's contribution and how these come together to create a forum for debate. This is not a forum for the presentation of multiple short papers. The emphasis is on exchange of ideas and discussion.

Short papers, snapshots and symposia/panel papers are not fully peer reviewed and thus do not attract DHET subsidy.

In future only the Book of Proceedings will be published in hard copy. All other submissions will be available electronically.

OFFICIAL OPENING PROGRAMME



SAARMSTE 2018



Pursuing sustainable and inclusive quality education through research informed practice in Mathematics,
Science and Technology

16th January 2018

Venue: Block 252 Room LT004

- 11:35 - 11:40:** **Master of Ceremony:** Prof Kgomo^tso Garegae, Head, Department of Mathematics & Science Education, University of Botswana
- 11:40 - 11:45:** **Welcome to Faculty of Education** by Prof Lily Mafela Dean, Faculty of Education, UB
- 11:45 - 11:50:** **Ushering Vice Chancellor of the University of Botswana,** Prof. Sebudubudu, DVCAA,
- 11:50 - 12:20:** **Opening Address by the University of Botswana Vice Chancellor,** Prof David Norris
- 11:20 - 12:30:** **Welcome** by SAARMSTE President Dr Lyn Webb
- 11:30 - 12:35:** **Announcements** by Dr Alex Nkhwalume, SAARMSTE 2018 LoC Chair
- 12:35 - 13:45:** **Lunch** www.ub.bw

Tuesday 16 JANUARY 2018

TIME		VENUE
8:00 – 10:00	REGISTRATION and TEA	
10:00 - 11:30 PLENARY WORKSHOPS		
	Professor Kgomotso Garegae and Dr Sesutho Kesianye, University of Botswana, Botswana - Gender issues in mathematics performance overturned: A potential window to understanding gender-biased classroom practices .	ROOM 1
	Professor Merrilyn Goos, Limerick University, Ireland - Mathematical Knowledge for Teaching: What Do Teachers Need?	ROOM 2
	Professor Dame Celia Hoyles and Professor Richard Noss, UCL Knowledge Lab, University College London, United Kingdom - Blending computational and mathematical thinking in primary education. (Bring a laptop to work in pairs.)	ROOM 3
	Professor Fred Lubben, University of York, United Kingdom – Getting your science education research published in Africa and beyond	ROOM 4
11:30 – 12:35	Official Opening Programme	
12:35 – 13:45	LUNCH	
13:45 – 14:00	Venue change to Block 252 Room LT004	
14:00 – 15:00	PLENARY SESSION 1: Professor Fred Lubben – A review of science education research in South Africa 2007 – 2016: Any pointers for STEM education? Introduced by Prof Meshach Ogunniyi	Block 252 Room LT004

15:00 – 16:45

Tuesday 16 JANUARY 2018
Session 1 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	
15:00 – 15:15	Venue change: Afternoon tea /coffee available throughout the afternoon							
15:15 – 16:00	Parallel 1 Chair: Lise Westaway	Parallel 2 Chair: Marissa Rollnick	Parallel 3 Chair: Marc Schäfer	Parallel 4 Chair: Angela Stott	Parallel 5 Chair: Ann MacKenzie,	Parallel 6 Chair: Lucy Sibanda	Parallel 7 Chair: Washington Dudu	
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8682 A research and development project for the development of prospective primary school teachers' competence in understanding and developing number sense (SYM). Lise Westaway, Zain Davis, Samukeliso Chikiwa, Nick Taylor, Corin Mathews	8411 Analysing science teachers' Pedagogical Content Knowledge - the second PCK summit: Perspectives from participants and spectators (SYM). Marissa Rollnick	8806 Code switching as a teaching strategy: What are the implications for mathematics teaching in multilingual classrooms? (LP). Clemence Chikiwa, Marc Schäfer	8785 Creating online videos for a first year engineering course (LP). Bevan Smith	8717 Pre-service science teachers' attitudes and preconceptions of teaching climate change in the classroom (LP). Ann Haley MacKenzie, Jenna Haley	8694 Linguistic complexity and related student errors in mathematical literacy examinations: Improving inclusive assessment practices for English language learners (LP). Pamela Vale	8808 Exploring South African senior phase Natural Science teachers' perceptions of selected CAPS elements: development and validation of a research instrument (SP). Washington T Dudu , Kgomotsego B. Samuel	
			16:00 – 16:45 SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8769 Title: Analysing the role and use of visualization objects in textbooks in Namibia (LP). Selma Ndilipomwene Nghifimule, Marc Schäfer.	8347 Physical sciences teachers' beliefs about technology for teaching and factors influencing their uptake of a specific technology (LP). Angela Stott	8433 Educators' conceptions of the nature of science (LP). Meshach Ogunniyi	8776 The linguistic component in mathematics assessment and attendant tensions and dilemmas: The teachers' experiences (LP). Lucy Sibanda.	8735 Images of a scientist from secondary school students in high density suburbs in Chinhoyi, Zimbabwe (SP). Welensky Mashavave, Elaosi Vhurumuku
			8323 From didactic to dialogical teaching - Intervention to foster scientific argumentation and dialogical teaching in Ethiopian teacher education (SP). Mekbib Alemu, Per Kind, Vanessa Kind, Mesfin Tadesse, Mulugeta Atnafu, Kassa Michael, Taha Rajab					
16:45 – 17:00	Venue change: Afternoon tea /coffee available throughout the afternoon							

Tuesday 16 JANUARY 2018 (contd) Session 2 (Parallel sessions)							
17:00 – 18:00	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
17:00 – 18:00	Parallel 1 Chair: Kgomotso G. Garegae	Parallel 2 Chair: Audrey Msimanga	Parallel 3 Chair: Pieter van Jaarsveld	Parallel 4 Chair: Ken Ngcoza	Parallel 5 Chair: Nellie Mbanjo	Parallel 6 Chair: Bernard Chigonga	Parallel 7 Chair: Megan Doidge
SP 30 mins SN 15 mins Please note duration of each presentation	8629 Language preferences in mathematics learning: perspectives from high school learners in rural contexts (SP). Michael Allie Makupe, Willy Mwakapenda	8353 The influence of continuous collaborative reflection sessions on how Gr 8 Natural Sciences teachers reflect on working with learner prior knowledge (SP). Jenny Woolway, Audrey Msimanga, Anthony Lelliott	8654 Mathematical symbolisation: how does it affect learners' understanding of mathematical concepts? (SP). Paul Mutodi	8787 Indigenous cultural practices and artefacts as models in science teaching (SP). Muzwa Mukwambo, Kenneth Ngcoza, Charles Chikunda	8661 The metacurriculum of first year science courses: the messages lecturers give to help students succeed (SP). Dale Taylor	8805 Sketching the cubic function from the graph of its first and second derivatives and vice-versa: deficiencies inherent in teachers' graphing fluency received (SP). Bernard Chigonga	8612 Perceptions of science student teachers during teaching practice: A case of one college in Lusaka, Zambia (SP). Lloyd Nsingo, Choshi Kasanda
	8702 Mathematics Teachers' Beliefs About Their Current Classroom Practices (SN). Fikile Mdluli	8609 Exploring the nature of students' written arguments in Grade 11 science classrooms (SP). Maletsau Mphahlele, Audrey Msimanga	8703 Promoting conceptual mathematics for teachers and learners by methods of abductive and retroductive inference - making what is algebraically tacit graphically explicit (SP). Pieter van Jaarsveld	8799 The influence of marine science camp on learners' motivation and dispositions towards scientific inquiry (SP). Nozipiwo Hambaze, Ken Ngcoza, Zukiswa Kuhlana	8775 Learning to use ASEI in a Community of Practice (SP). Nellie Mbanjo	8771 Using mathematical knowledge for teaching to examine the growth of preservice teachers' knowledge for teaching (SP). Dun Nkhoma Kasoka	8665 What will they teach? Student teachers' concerns about teaching human reproduction in secondary schools (SP). Megan Doidge
	8714 Parents' engagement in their children's school work: The case of Mathematics (SN). Tlhatlogo Sengawane, Kgomotso G. Garegae						
18:00 – 19:00	SAARMSTE Choir Practice (conducted by Marissa Rollnick). Venue to be announced						
19:00 – 20:30	SAARMSTE Welcome Function – Introduce yourself to at least 10 people						

WEDNESDAY 17 JANUARY 2018

8:15 – 9:45

Session 3 (Parallel sessions)

	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
8:15 – 9:45	Parallel 1 Chair: Mercy Kazima	Parallel 2 Chair: Stephen Malcolm	Parallel 3 Chair: Debbie Stott	Parallel 4 Chair: Leila Goosen	Parallel 5 Chair: Mamotena Mpeta	Parallel 6 Chair:	Parallel 7 Chair: Rene Toerien
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8571 Strengthening numeracy in early years through professional development of teachers in Malawi (SYM). Mercy Kazima, Arne Jakobsen, Janne Fauskanger, Raymond Bjuland	8427 : The shape of TSPCK in a classroom (SYM). Elizabeth Mavhunga, Nonkanyiso Vokwana, Kgomotsego Samuel, Mamohato Makhechane, Stephen Malcolm, Washington Dudu	8528 'It's the context that confuses them': Intermediate phase learners' performance on arithmetical items presented as context problems or bald calculations (SP). Mike Askew, Hamsa Venkat, Patrick Barmby, Sameera Hansa, Corin Mathews, Samantha Morrison, Viren Ramdhany	8314 Sustainable and Inclusive Quality Education through Research Informed Practice on Information and Communication Technologies in Education (LP). Leila Goosen	8781 Affordances and limitations of integrating learners' socio-cultural backgrounds in science teaching (LP). Lydia Mavuru	8720 Pre-service Mathematics Teachers Semiotic Transformation of Similar Triangles (SP). Ifunanya J.A. Ubah, Sarah Bansilal	8779 How spiral is the CAPS curriculum on the topic Chemical Change and its fundamental concepts (SP). Brighton Mudadigwa
			8641 Visualising Grade 6 after-school mathematics club learners shifting mathematical proficiency along a spectrum of progression (SP). Debbie Stott , Noluntu Baart				
			8818 Algebraic thinking in Grade 3: a comparative study of South Africa and Singapore curricula (SP) Sharon Mc Auliffe, Dominique Afonso	Casio Calculators Demonstration and Discussion (45 mins). Astrid Scheiber	8777 The implementation of Natural Sciences and Technology by primary schools in Vhembe District, Limpopo (SN). Mamotena Mpeta, Ivy N. Mathuba, Sam J. Kaheru	8607 Kindergarten and primary teachers' specialized knowledge in and for defining geometric figures (SP). Milena Policastro, Alessandra Almeida, Miguel Ribeiro	8449 Measuring the Quality of Physical Science Teachers' Topic Specific Pedagogical Content Knowledge in Electrochemistry in Mpumalanga (SP). Fumai M. Mudindo, Megan Doidge, Marissa Rollnick
9:45 – 10:15	TEA						

Wednesday 17 January 2018

10:15 – 11:45

Session 4 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7			
10:15-11:45	Parallel 1 Chair: Lyn Webb	Parallel 2 Chair: Margaret Probyn	Parallel 3 Chair: Nicky Roberts	Parallel 4 Chair: Jeanne Kriek	Parallel 5 Chair: Kenneth Mlungisi Ngcoza	Parallel 6 Chair: Craig Pournara	Parallel 7 Chair: Frackson Mumba			
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8289 Understanding and Fostering the Mathematics Learning of Language by Learners - Overview of a chain of projects with different research approaches (SYM). Susanne Prediger, Lyn Webb	8742 Talking to learn science and mathematics: Lessons from South African and UK classrooms (SYM). Audrey Msimanga, Margaret Probyn, Sue Johnston-Wilder, Martin Braund	8660 Mathematical inclusion in 4 SADC counties (SYM). Nicky Roberts, Lindiwe Tshuma, Nkosinathi Mpalami, Tionge Saka	8361 Exploring which technologies do students believe enhance their learning (SP). Jeanne Kriek, Annaretha Coetzee	8774 Pre-service teachers' perceived views about teaching science through argumentation (LP). Senait Ghebru, Meshach Ogunniyi	8815 Grade 10 learners' errors with negative numbers (SP). Yvonne Sanders, Craig Pournara	8436 Teacher Profiles for Teaching Stoichiometry Based on Topic-Specific Pedagogical Content Knowledge, Content Knowledge and Conceptions of the Mole (SP). Stephen Andrew Malcolm, Elizabeth Mavhunga, Marissa Rollnick			
				8744 Challenges in implementing the use of digital technologies for teaching and learning at eight public secondary schools in Tshwane South District, South Africa (SP). Olika Moila, Moses Makgato, Sibongile Simelane-Mnisi				8811 A diagnostic assessment of learners' prior electricity knowledge before learning Ohm's law (LP). Lineo F. Ramasike & Kenneth Mlungisi Ngcoza	8749 A preservice secondary school teacher's eliciting, interpreting and developing students' thinking in linear equations (SP). Florence Mamba	8428 US Chemistry teaching tssistants' knowledge of chemical bonding & the explanatory principles they use to explain it (SP). Marissa Rollnick, Frackson Mumba, Laura O. Pottmeyer, Rene Toerien
				8414 Pursuing Sustainable and Inclusive Quality Education through Research Informed Practice in Information and Communication Technology (SP). Leila Goosen, Lizelle Naidoo				8762 Investigating Secondary Mathematics Teachers use of exemplification and the affordances these provide for learning Mathematics (SP). Vasanth Moodley.	8755 Indigenous technology approach of the peanut flour processing in science education: Case study of grade 12 graduated students in Chidenguele (SP). Geraldo F. Nhapulo	
11:45 – 12:00	Venue change to Block 252 Room LT004									
12:00 – 13:00	PLENARY SESSION 2: Prof Merrillyn Goos - Sustaining and Scaling Up Research-Based Professional Learning for Mathematics Teachers. Introduced by Hamsa Venkat						Block 252 Room LT004			
13:00 – 14:15	LUNCH									

Wednesday 17 January 2018

14:15 – 15:15

SESSION 5 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
14:15 – 15:15	Parallel 1 Chair: Marthie van der Walt	Parallel 2 Chair: Femi Otulaja	Parallel 3 Chair: Thea Corbett	Parallel 4 Chair: Leila Goosen	Parallel 5 Chair: Elizabeth Mavhunga	Parallel 6 Chair: Andile Mji	Parallel 7 Chair: Thomas Sedumedi
SP 30 mins SN 15 mins Please note duration of each presentation	8605 The impact of mathematics professional development on learner attainment: Issues in the design of an instrument and initial results from a quasi-experimental study (SP). Craig Pournara, Patrick Barmby	8716 Designing an Intervention Programme Merging Music and Mathematics in Foundation Phase (SP) Carolyn Stevenson-Milln	8422 Framework for the continuance use intention of mobile mathematical learning games (SP). Marisa I. Venter, Lizette De Wet	8457 Drivers of Innovative Behaviour: Modelling the Mediating Effect of Knowledge Sharing Behaviour on Information Technology Students' Individual and Contextual Antecedents (SP). Leila Goosen, James Ngugi	8796 The development and validation of a rubric for assessing TSPCK in classroom practice (SP). Josephat Miheso, Elizabeth Mavhunga	8698 Exploring mathematics teachers' beliefs about teaching Geometry at school level (SP). Dikeledi Mamiala, Andile Mji, Sibongile Simelane-Mnisi	8633 An evaluation of assessment practices of teaching practicum in initial science teacher preparation (SN). Thomas Sedumedi
	8583 Mathematics teachers' perceptions of the value of an ethno-mathematical approach: The case of a professional development intervention (SP). Marthie van der Walt, Divan Jagals, Erika Potgieter	8618 The use of music in learning: Locating traditional songs as a learning device in the classroom (SP). Sina J. Fakoyede, Femi Otulaja	8790 8790 'Is the juice worth the squeeze?': Impact of collaborative project work assignments in Statistics and Academic Literacy (SP). Thea Corbett, Ilse Fouché, Susan Immelman	8763 Probing effective use of selected assessment theories in Civil Technology theory and hands-on practical lessons. A case of five schools in Ekurhuleni Metropolitan municipality (SP). Thokozani I. Mtshali, Sylvia Manto Ramaligela, Moses Makgato	8741 The journey of TSPCK episodes from lesson planning to classroom teaching (SP). Denise van der Merwe, Elizabeth Mavhunga	8801 Investigating students' perception of a blended classroom approach used in a post-graduate module at an urban university in South Africa (SP). Benita Nel	8768 A reflection on the approach of inorganic reactions in general secondary school - Case of Zona Verde Secondary School (SP). Antonio Goenha

15:15 – 15:30

Venue change to Block 252 Room LT004

15:30– 17:00

SAARMSTE AGM – Chaired by Lyn Webb

Block 252 Room LT004

17:00

SAARMSTE Chapter Meetings – Chaired by Mike Mhlolo

Block 252 Room LT004

8:15 – 9:45

**THURSDAY 18 JANUARY 2018
SESSION 6 (Parallel sessions)**

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
8:15 – 9:45	Parallel 1 Chair: Susanne Prediger	Parallel 2 Chair: Neal Petersen	Parallel 3 Chair: Minenhle Ngcobo	Parallel 4 Chair: Duncan Mhakure	Parallel 5 Chair: Frikkie George	Parallel 6 Chair: Deepak Pravin Mavani	Parallel 7 Chair: Tulsii Morar
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8301 Symposium on students' active participation in mathematics classroom discussions (SYM). Kirstin Erath	8732 Indian indigenous knowledge in South African life sciences? (SP). Camantha Reddy, Josef De Beer, Neal Petersen	8772 University of Swaziland first year students' beliefs about mathematics and how they compare with their performance in a first semester course (LP). Quinton T. Ndlovu, Minenhle Ngcobo	Casio Calculators Demonstration and Discussion. 45 mins Astrid Scheiber	8816 Pre-service teachers' reflections of the assessment of practical work in Physical Science (SP). Suresh Singh	8766 Dynamic Geometry Software as a visualisation tool to enhance the learning of Geometry (SP). Deepak Pravin Mavani, Beena Deepak Mavani, Marc Schäfer	8807 Senior Phase learners' multilingual language resources as a third space in enabling the learning of science (SN). Rochelle Thorne, Paul Webb, Nokhanyo Mayaba
		8783 Decolonizing science education curriculum in Higher Education Institutions: Reclaiming cultural heritage as a source of knowledge (SP). Kenneth M. Ngcoza	8804 Investigating procedural and conceptual knowledge of grade 7-9 students: A focus on fraction operations (LP). David Mogari, HS Willers	8746 Using diffusion of innovation theory to understand how technology is adopted in teaching mathematics in higher education (SP). Sabelo Chizwina, Duncan Mhakure	8689 Dialogical Argumentation and Assessment for Learning Instructional Model (DAAFLIM) and the conception of N2-science concepts (SP). Frikkie George	8765 The use of DGS as a visualisation tool in teaching of Geometry (SP). Beena Deepak Mavani, Deepak Pravin Mavani, Marc Schäfer	8626 Exploring physical sciences teachers strategies of doing practical work activities in schools with lack of scientific equipment (SN). M.J. Kokonyane, Benedict Khoboli
							8648 Earth's movement in space: Exploring knowledge building and meaning-making (SN). Ngonidzasi Mashaikwa, Mpunki Nakedi, Lee Rusznyak

09:15 – 09:45

THURSDAY 18 JANUARY 2018 (Continued)

Session 6 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
09:15-09:45	Parallel 1 Chair: Susanne Prediger	Parallel 2 Chair: Neal Petersen	Parallel 3 Chair: Minenhle Ngcobo	Parallel 4 Chair: Duncan Mhakure	Parallel 5 Chair: Frikkie George	Parallel 6 Chair: Deepak Pravin Mavani	Parallel 7 Chair: Tulsii Morar
		8809 Status of Indigenous Knowledge Systems in selected public schools': A review and reflection using the DAIM-model (SP). Alvin Riffel		8532 Assessing the Level of eReadiness among the Secondary School Learners in Botswana (SN). Edward Zimudzi, Watson Manduna, Salome M. Mogotsi	8740 A microanalysis of difficulties experienced by students in the Physical Science grade 12 examinations (SP). Leelakrishna Reddy	8770 Patterns in Collective Efficacy and Self-Efficacy Beliefs of Teachers and the Teaching of Mathematics in Poorly Resourced High schools (SP). Winston Hendricks	8646 The geographies of the learning experience of girls in learning the Science subject in schools (SN). Nelisiwe Nick Ndwandwe 8699 Conceptualizing value as a factor in Natural Sciences learning in grade 9 classrooms in South African schools (SN). Eyitayo Julius Ajayi, Shalini Dukhan, Femi Otulaja
9:45 – 10:15	TEA						

10:15 – 11:45

THURSDAY 18 JANUARY 2018 (Continued)

Session 7 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	
10:15 – 11:45	Parallel 1 Chair: Nicky Roberts	Parallel 2 Chair: Auxilia Kaunda	Parallel 3 Chair: Lisnet Mwadzaangati	Parallel 4 Chair: Nadaraj Govender	Parallel 5 Chair: Marissa Rollnick	Parallel 6 Chair: Ingrid Sapire,	Parallel 7 Chair: Judith Lederman	
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8664 How do we determine if a mathematics education intervention is successful? (SYM). Lynn Bowie, Andrew Barrett, Nicky Roberts, Craig Pournara, Lindiwe Tshuma	8752 Exploring National Certificate Vocational (NCV) level two students' misconceptions based on a hyperbola function (SP). Abongile Ngwabe, Clyde Felix	8786 Towards a comprehensive conception of mathematical proof among Zimbabwean mathematics education undergraduates (SP). Zakaria Ndemo	8359 Natural Science teachers' use of ICT (SP). Nadaraj Govender, Avash Juggernath	8350 A Lesson on Teaching the Mole Concept Conceptually: A Learning Study (LP). Stephen Andrew Malcolm, Elizabeth Mavhunga, Marissa Rollnick	8625 Effectiveness of semiosis for solving the quadratic equation (SN). Clement Ayarebilla Ali, Ernest Kofi Davis, Douglas Darko Agyei	8367 International Study of Seventh Grade Students' Understandings of Scientific Inquiry (SP). Selina Bartels, Judith Lederman, Norman Lederman	
		8304 Situation Analysis for Introducing EDMS at Tertiary Education: A Case of The Polytechnic in Malawi (SP). Auxilia Kaunda, Patrick Chikumba, Ramsey Banda, Umali Leonard	8282 An exploration of the work of teaching geometric proofs: The case of Malawian secondary mathematics teachers (SP). Lisnet Mwadzaangati	8574 Investigating the impact of using the TSPCK framework on the content knowledge of in-service teachers: An exploratory case study (SP). Eunice Nyamupangedengu, Narendra Deshmukh		8614 Novice unqualified science teachers' change in PCK of the particulate nature of matter as identified by their content representations (LP). Phihlo Pitjeng-Mosabala, Marissa Rollnick		8812 Multilingualism in Foundation Phase Mathematics - a language survey in twenty schools (SN). Ingrid Sapire, Dineo Makoro, Thompho Rambuda, Benny Mojela
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation		8685 Using fractions as measures for reasoning about fractions: A design experiment (SN). Pamela Vale, Mellony Graven	8760 The correlation between metacognition and mathematics achievement in a non-complex and a problem-solving task (SP). Stephan Du Toit	8444 Learning about interactions in a university biology classroom through lecture observations: Reflections of a novice teacher educator (SP). Hlologelo C. Khoza, Eunice Nyamupangedengu		8813 Multilingualism in Foundation Phase Mathematics - an analysis of learning and teaching support material (SN). Ingrid Sapire, Michael Louw, Sylvester Molokoane, Ntombikayise Zulu	8405 Is design-based research important in a Southern African mathematics education context? (SN) Brantina Chirinda, Patrick Barmby	8627 Investigating natural sciences teachers strategies of creating learning opportunities to primary students in Lesotho (SN). Benedict Khoboli, M. J. Kokonyane

11:15 – 11:45

THURSDAY 18 JANUARY 2018 (Continued)

Session 7 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
11:15 – 11:45	Parallel 1 Chair: Nicky Roberts	Parallel 2 Chair: Auxilia Kaunda	Parallel 3 Chair: Lisnet Mwadzaangati	Parallel 4 Chair: Nadaraj Govender	Parallel 5 Chair: Marissa Rollnick	Parallel 6 Chair: Ingrid Sapire,	Parallel 7 Chair: Judith Lederman
		8690 Snapshot: Grade R teacher identity in policy (SN). Roxanne Long				8637 Visualisation and mathematical reasoning in geometry word problem solving (SN). Beata Dongwi, Marc Schäfer	8791 General self-efficacy as a capability towards appropriate choice regarding grade 10 physical sciences (SN). Zettie Venter, Angela Stott
						8709 Zimbabwean Science and Mathematics Teacher Migrants in South Africa: Experiences and Perceptions of Treatment (SN). Judah Makonye, Elaosi Vhurumuku	MOVED from 17/01/2018 14:45 8672 Acid-base Threshold Concepts and Chemistry Students' High Drop out (SN). Royda Kampamba
11:45 – 12:00	Venue change to Block 252 Room LT004						
12:00 – 13:00	PLENARY SESSION 3: Professor Dame Celia Hoyles - Exploiting digital technologies for inclusive mathematics learning. Introduced by Dr Lyn Webb					Block 252 Room LT004	
13:00 – 14:15	LUNCH						

14:15 – 15:45

THURSDAY 18 JANUARY 2018 Session 8 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
14:15 – 15:45	Parallel 1 Chair: Hamsa Venkat	Parallel 2 Chair: Marissa Rollnick	Parallel 3 Chair: Norman G. Lederman	Parallel 4 Chair: Thabo Tholo	Parallel 5 Chair: Andile Mji	Parallel 6 Chair: Fatou Sey	Parallel 7 Chair: Washington Dudu
SYM 90 mins LP 45 mins SP 30 mins SN 15 mins Please note duration of each presentation	8659 Online assessment of mathematics for B.Ed students (SYM). Nicky Roberts, Lynn Bowie, Kathleen Fonseca, Sharon McAuliffe, Hamsa Venkat	Possibility of a grand rubric for differentiating the quality of science teachers' pedagogical content knowledge (PCK) (SP) Marissa Rollnick, Kennedy Chan, Julie Gess Newsome	8789 Use of Games in the Teaching of Mathematics: Experiences of Two Cohorts of Pre-Service Teachers (SP). Fraser Gobede	8800 Factors affecting performance in first-year programming (SP). Yirsaw Ayalew, Ethel Tshukudu, Moemedi Lefoane	8642 Using classroom talk to practice scientific talk in physics classrooms: A case of two physics teachers (SP). Makomosela Qhobela, Eunice K. Moru	8793 The role of video analysis in developing the Foundation Phase Pre-service teachers' reflective practice and Mathematical Knowledge for teaching (SN). Samukeliso Chikiwa	8705 South African Science Learners' Knowledge, Attitudes, Perceptions and Practices in Climate Change - a Baseline Study (SP). Mpunkhi Nakedi
		8589 What is the nature of Physical Science teacher identity following participation in a professional learning community? (SP) Suzan Segwe	8817 An emerging framework to inform the learning and teaching of additive relations problem-solving (SP). Herman Tshesane	8653 Appraisal of curriculum and assessment policy statements for technical subjects with specific reference to Mechanical Technology (SP). Thabo Tholo, Duma Sithebe	8758 Understanding learning styles and learning style-based instructional strategies and the impact on Physical Science education success: The case of Mthatha high schools in South Africa (SP). Sakyiwaa Danso, Emmanuel Mushayikwa	8572 Gender-Related Effects of arts infused Mathematics lesson on learners' performance in elementary school (SN). Olusola Ariba, Kakoma Luneta	8803 Exploring pre-service teachers' prior knowledge and understanding of baseline genetics concepts: A case study at a South African university (SP). Eunice Nyamupangedengu
		8473 The conceptions of PCK in Mathematics Education and Science Education (SN). Kim Ramatlapana, Marissa Rollnick, Hamsa Venkat	8303 Student Responses to Academic Behavior Specific Feedback When Engaged in Unfamiliar Math Content (SP). Kathryn M. Rupe, Judith S. Lederman, Norman G. Lederman	8308 The experience of using learning objects (SN). Arlete M. V. Ferrao, Rosa M. Vicari	8565 The phenomenological thinking and semiotic devices: Perspectives from physical science educators (SP). Asaph Nkomo, Andile Mji	8559 Students' mathematical competency levels in SACMEQ III study: key drivers of SDG 4 (SN). Salome Mogotsi, Sesutho Kesianye	8407 Teaching Genetics Using Modern Learning Technologies: A Snapshot of Four Case Studies (SN). Dionysius Gnanakkan, Norman Lederman, Judith Lederman, Miriam Schmid, Elizabeth Druger, Bridget Lesinski, Sue Jones

15:45 – 17:00

THURSDAY 18 JANUARY 2018 Session 9 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7
15:15 – 15:45	Parallel 1 Chair:	Parallel 2 Chair: Marissa Rollnick	Parallel 3 Chair:	Parallel 4 Chair: Thabo Tholo	Parallel 5	Parallel 6 Chair: Fatou Sey	Parallel 7 Chair: Washington Dudu
		8326 Biology laboratory work in pre-service teacher education: the potential for argumentation as a learning tool (SN). Naomi Thomas		8657 TPACK Framework for Pre-Service and In-Service Programs for the Integration of Technology in the School Of Education (SN). Sibongile Ngcapu, Andile Mji, Sibongile Mnisi		8305 Examining Secondary School Teachers' Perspective of Connection and Conceptual Connection Between Mathematics and Science in Zambia (SN) Masato Kosaka	8332 A kinaesthetic approach to learning about the heart and circulatory system (SN). Sanette Brits, Josef de Beer, Martin Braund
15:45 – 16:00	Venue change: Afternoon tea /coffee available throughout the afternoon						
16:00 – 17:00	Parallel 1 Chair: Eunice Nyamupangedengu	Parallel 2 Chair: Zukiswa Kuhlane	Parallel 3 Chair: Martie Sanders	Parallel 4 Chair: Washington Dudu	Parallel 5 Chair: Audrey Msimanga	Parallel 6 Chair: Judith Lederman	Parallel 7 Chair: Arsénio José Mindú
SP 30 mins SN 15 mins Please note duration of each presentation	8750 Perceptions of student-teachers to use puppetry as pedagogy to enhance the affective domain in Life Sciences teaching (SP). Lounell White, Neal Petersen	8579 Exploring Inquiry Based Learning Approach used to develop Basic Scientific Process Skills and Scientific Knowledge in Grade 3 Foundation Phase Classrooms (SP). Zukiswa Kuhlane	8343 Grade 8 learners' interpretations of problematically worded textbook statements about evolutionary adaptation (SP). Shaun Robertson, Martie Sanders	8652 School Laboratory Chemical Waste Management Practices in Lesotho: Appreciating Education for Sustainable Development (ESD) (SP). Tom Ssendija, Makomosela Qhobela	8290 The Language of Instruction in the Learning and Teaching of Science: Messages from South African Grade 9 Learners' Meanings of Non-technical Words (SP). Samuel Ouma Oyoo, Tebogo Simelane	8277 Influencing Secondary Students' Understanding of Nature of Science with Socioscientific Issues (SP). Dawnne LePretre, Norman Lederman, Judith Lederman	8570 The feasibility of a third partner in science teacher education (SN). Josef de Beer
	8670 The use of Legitimation Code Theory to explore the pre-service teachers' knowledge of the nature of Life Science (SP). Uchechi Ahanonye, Eunice Nyamupangedengu	8782 Grade two Learners' Cognitive Shifts on the movement of the day and night cycle (SP). Florence February, Cynthia Fakudze, Lorraine Philander	8802 A longitudinal study of Life Sciences students' acceptance of evolution (SP). Sean Lawrence, Martie Sanders	8419 Engineering Design in Science Teacher Education Project: Teachers' Pedagogical Knowledge for Engineering Design Integrated Science Teaching, and Student Learning (SP). Frackson Mumba, Vivien Chabalengula	8441 Participation and engagement in the science classroom: parallel or independent variables? (SP). Paul Denley, Audrey Msimanga	8679 Online assessment of thinking skills in science context and motivation to learn science among the grade 7 students in Oshana region, Namibia (SP). Linus Kambeyo, Attila Pasztor, Erzsébet Korom, Mária B. Németh	8410 Validation of Medicinal Plants with Therapeutic Effect in the Control of Diabetes used by the Community of Manhiça (SN). Fernando Come
							8273 Pre-conceptions of Renewable Energy Graduation Students about Energy Efficiency in Pedagogical University - Mozambique (SN). Arsénio José Mindú
19:00	Gala Dinner						

8:30 – 9.30

FRIDAY 19 JANUARY 2018

Session 10 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6
8:30 – 9.30	Parallel 1 Chair: .Liveness Phiri	Parallel 2 Chair: Zainoensia Allie	Parallel 3 Chair: Danielle Barkay	Parallel 4 Chair: Astrid Scheiber	Parallel 5 Chair: Kenneth M. Ngcoza	Parallel 6 Chair: Michael Gaines
SP 30 mins SN 15 mins Please note duration of each presentation	8792 Using Dynamic geometry computer software to enhance learners' understanding in geometry concepts- a case study of two selected schools in South Africa (SN). Folake Adelabu, Moses Makgato, Manto Ramaligela	8753 Exploring the 'how' and the 'why' of Physical Science Pre-service teachers' learning processes: An explanatory study on the acceptability of the Self-regulated learning theory as a promoter of concept (SP). Nkosinothando Chamane, Lebala M. Kolobe	8691 Teachers' use of exemplification and explanations in mediating the object of learning (SP). Danielle Barkay	8302 Senior Secondary School Physical Science Teachers' Perceptions of Formative Assessment Use in Swaziland (SP) Mzenzi Mazuku, O.I. Oloyede, Victoria Louise Kelly	8474 Narrative case study of Indigenous practices for integration in Physical Sciences: the search for relevant IK content for Physical Sciences (SP). Dumile Moyo	8518 Science Made Sensible Program: A tier mentoring model for increasing STEM engagement in U.S. and South Africa Schools (SP). Jane Indorf, Tiffany Plantan, Rian de Villiers, Dirk van Schalkwyk, Michael Gaines
	8797 Math-animally speaking: A narrative reading of Animal Farm from a mathematical perspective (SP). Liveness Phiri, Willy Mwakapenda	8584 Using an expansion of the DIRECT VERSION 1.0 diagnostic test to elicit pre-service science teachers' alternative conceptions on electric circuits (SP). Zainoensia Allie	8606 Secondary prospective teachers' interpretative knowledge on primary school contents: a case on subtraction algorithms (SP). Miguel Ribeiro, Maria Mellone, Arne Jacobsen	Casio Calculators Demonstration and Discussion (30 mins). Astrid Scheiber	8784 The inclusion of local or indigenous knowledge in science lessons in Namibian schools: Possibilities and challenges (SP). Fredrick S. Simasiku, Kenneth M. Ngcoza	8402 Generation of Bio Hydrogen from Livestock Waste (SP). Alberto Boane, Antonio Manjane
	8640 Exploring Students' Affective domain towards writing a Mathematics Test: Presenting Results (SN). Simon Maneya, Willy Mwakapenda					
9:30 – 10:00	TEA					

10:00 – 11:00

FRIDAY 19 JANUARY 2018
Session 11 (Parallel sessions)

TIME / VENUE	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6
10:00 – 11:00	Parallel 1 Chair: Lesego Tawana	Parallel 2 Chair: Elizabeth Mavhunga	Parallel 3 Chair: Alakanani Nkhwalume	Parallel 4 Chair: Shalini Dukhan	Parallel 5 Chair: Alfred Mvunyelwa Msomi	Parallel 6 Chair: Thapelo Mamiala
SP 30 mins SN 15 mins Please note duration of each presentation	8508 Progress of School Intervention Teams (SITs) in Botswana: A case study of one Community Junior Secondary School (CJSS). (SP). Lesego Tawana, Betty Rampana	8743 The relationship between pre-service teachers' classroom topic specific PCK and learner views (SP). Olotosin S. Akinyemi, Elizabeth Mavhunga	8567 Rhetoric and Reality of Postmodernism in Mathematics Education: The Implementation versus Performance in the Botswana General Certificate of Secondary Education Mathematics Curriculum (SP). Alfred Bhusumane, Alakanani Nkhwalume.	8316 Teaching slides and their impact on student learning: The good, the bad, and the ugly (SP). Shalini Dukhan	8734 Mathematics teachers' investigation on the effective use of the free dynamic mathematics software package GeoGebra in teaching functions at a school level (SP). Alfred Mvunyelwa Msomi	The implementation of engineering graphics and design practical assessment task in Grade 12 High school (SP). Ndilehile Skosana, Thapelo Mamiala & Arthur Ngwezi CANCELLED DUE TO THEFT OF POSSESSIONS DURING THE NIGHT
	8446 Play Science (SP). Thandiwe Sekhibane, Michael Cross	8619 Evaluating the Advantage offered by an early exposure of science pre-service teachers to Topic Specific Pedagogical Content (SP). Josephat Miheso, Elizabeth Mavhunga	8569 The challenges of using computers in the teaching of Botswana junior secondary schools mathematics as a SMASSE intervention strategy (SP). Mompoti Onkabetse, Alakanani Nkhwalume,	8788 Improving tertiary teaching practice: Demystifying STEM disciplines (SN). Rethabile Tekane, Marietjie Potgieter, Ina Louw	8725 Evaluation and assessment of learning in the Mathematics and Science classrooms - the case of Botswana (SN). Moipolai J Motswiri, Kgomotso Garegae	8668 Sustainable features of Consumer Studies as a subject within Science and Technology CESM grouping implications on its role (SN). Neo Mafa Theledi, Thapelo Mamiala, Arthur Ngwezi CANCELLED DUE TO THEFT OF POSSESSIONS DURING THE NIGHT 8299 Biodiesel production from edible oil wastewater sludge with bioethanol using nano-magnetic catalysis (SN). Wighens N. Ilunga, Pamela Welz, Seun Oyekola, Daniel Ikhu-omoregbe

11:00 – 11:15

Venue change to Block 252 Room LT004

11:15 – 12:15

PLENARY SESSION 4: Prof Kgomotso Garegae - Pursuing sustainable and inclusive quality STEM education through research informed practice in Southern Africa: An introspection. Introduced by Prof Kenneth Mlungisi Ngcoza

Block 252 Room LT004

12:15 – 12:45

Presentation by SAARMSTE LoC Chairperson: 2019 – Dr Nadaraj Govender, University of KwaZuluNatal

12:45 – 13:00

Closure by SAARMSTE President Dr Lyn Webb

13:00 – 14:15

LUNCH

Writing Clinic : Professor Fred Lubben:- Chief Editor of accredited AJRMSTE

(NB as per prior confirmed acceptance)

Friday 19 January 2018, 14:00 - Saturday 20 January 2018, 15:00

Title	First Names	Surname	Institution
Dr	Mekbib Alemu	Aboretugne	College of Education and Behavioral Studies; Addis Ababa University
Mrs	Folake	Adelabu	Tshwane University of Technology
Ms	Uchechi	Ahanonye	University of the Witwatersrand; Johannesburg; South Africa.
Mr	Eyitayo Julius	Ajayi	University of the Witwatersrand; Johannesburg
Mr	Olutosin Solomon	Akinyemi	University of the Witwatersrand; Johannesburg; South Africa.
Mr	Clement Ayarebilla	Ali	University of Education; Winneba, Ghana
Ms	Zainoenisa	Allie	University of the Western Cape
Prof	Michael	Askew	University of the Witwatersrand; Johannesburg; South Africa.
Prof	Yirsaw	Ayalew	University of Botswana
Ms	Noluntu	Baart	Rhodes University
Ms	Danielle	Barkay	University of the Witwatersrand; Johannesburg; South Africa.
Mr	Andrew	Barrett	OLICO
Dr	Senait Ghebru	Berhe	University of the Western Cape
Mr	Alfred	Bhusumane	Botswana Teachers' Union
Prof	Raymond	Bjuland	University of Stavanger; Norway
Prof	Alberto	Boane	Pedagogical University of Mozambique - Universidade Pedagógica
Dr	Marie-Louise	Botha	University of Stellenbosch
Dr	Lynn	Bowie	OLICO/University of the Witwatersrand; Johannesburg; South Africa.
Prof	Martin	Braund	Cape Peninsula University of Technology (CPUT)
Prof	Sanette (JS)	Brits	University of Limpopo
Ms	Nkosinotando	Chamane	University of KwaZuluNatal
Dr	Benard	Chigonga	University of Limpopo
Mrs	Samukeliso	Chikiwa	Rhodes University
Dr	Clemence	Chikiwa	Rhodes University
Mrs	Mavis Rufaro	Chikoore	University of Zimbabwe
Ms	Brantina	Chirinda	University of the Witwatersrand; Johannesburg; South Africa.
Prof	Fernando Antonio	Come	Pedagogical University of Mozambique - Universidade Pedagógica

Mrs	Thea	Corbett	University of Pretoria
Ms	Sakyiwa	Danso	University of the Witwatersrand; Johannesburg; South Africa.
Prof	Zain	Davis	University of Cape Town
Prof	Josef	De Beer	North West University
Mrs	Beena	Deepak Mavani	Rhodes University
Dr	Paul	Denley	University of Bath, United Kingdom
Dr	Narendra	Deshmukh	University of the Witwatersrand; Johannesburg; South Africa.
Mrs	Phumlile Patricia	Dlamini	Ministry of Education and Training
Mr	Mafihlo	Dlamini	Lozitha National High School
Ms	Nolwazi	Dlamini	Hermann Gmeiner (SOS) High School
Dr	Megan	Doidge	University of the Witwatersrand; Johannesburg; South Africa.
Mr	Gilbert	Dolo	University of Cape Town
Ms	Beata	Dongwi	Rhodes University
Dr	Stephan	Du Toit	Australian Catholic University
Prof	Washington T.	Dudu	North West University
Dr	Shalini	Dukhan	University of the Witwatersrand; Johannesburg; South Africa.
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