

COMSTEDA 17

**The 17th Regional Conference for Mathematics,
Science and Technology Education in Africa
[COMSTEDA 17] and, Annual SMASE-Africa
Delegates Meeting**



SMASE-Africa



***Theme: Teacher Professional Development
in Africa: Knowledge, Skills and Values in
STEM Learning Environments***



REPUBLIC OF KENYA

CONFERENCE PROGRAMME

**16th to 20th DECEMBER, 2019 CEMASTE, A,
NAIROBI-KENYA,**



CEMASTE

WIMBO WA TAIFA, KENYA

Ee Mungu nguvu yetu
Ilete baraka kwetu
Haki iwe ngao na mlinzi
Natukae na udugu
Amani na uhuru
Raha tupate na ustawi.

Amkeni ndugu zetu
Tufanye sote bidii
Nasi tujitoe kwa nguvu
Nchi yetu ya
Kenya tunayoipenda
Tuwe tayari kuilinda.

Natujenge taifa letu
Ee ndio wajibu wetu
Kenya istahili heshima
Tuungane mikono pamoja kazini
Kila siku tuwe nashukrani.



WIMBO WA JUMUIYA YA AFRIKA MASHARIKI

Ee Mungu twaomba ulinde
Jumuiya Afrika Mashariki
Tuwezeshe kuishi kwa amani
Tutimize na malengo yetu.

Chorus
Jumuiya Yetu sote tuilinde
Tuwajibike tuimarike
Umoja wetu ni nguzo yetu
Idumu Jumuiya yetu.

Uzalendo pia mshikamano
Viwe msingi wa Umoja wetu
Natulinde Uhuru na Amani
Mila zetu na desturi zetu.

Viwandani na hata mashambani
Tufanye kazi sote kwa makini

Tujitoe kwa hali na mali
Tuijenge Jumuiya bora.



AU Anthem

Let us all unite and celebrate together
The victories won for our liberation
Let us dedicate ourselves to rise together
To defend our liberty and unity

*O Sons and Daughters of Africa
Flesh of the Sun and Flesh of the Sky
Let us make Africa the Tree of Life*

Let us all unite and sing together
To uphold the bonds that frame our destiny
Let us dedicate ourselves to fight together
For lasting peace and justice on earth

Chorus

Let us all unite and toil together
To give the best we have to Africa
The cradle of mankind and fount of culture
Our pride and hope at break of dawn.

Chorus





His Excellency Hon. Uhuru Kenyatta,
C.G.H., President and Commander-in-
Chief of the Defence Forces of the
Republic of Kenya.

Ministry of Education, Kenya
Warmly welcomes
COMSTEDA 17 Delegates!



Prof. George A.O. Magoha, CBS
Cabinet Secretary,
Ministry of Education, Kenya

SMASE AFRICA EXECUTIVE COMMITTEE AND COMSTEDA 17 ORGANIZING COMMITTEE

SMASE Africa Executive Committee

- | | |
|---------------------------|------------------------------|
| 1. Mr. Benson Banda | President, Zambia |
| 2. Prof. Sarifa Fagilde | Deputy President, Mozambique |
| 3. Mrs. Jacinta L. Akatsa | Executive Secretary, Kenya |
| 4. Mrs Mary W. Sichangi | Treasurer, Kenya |
| 5. Mr. Gregory Njogu | Administrator, Kenya |

COMSTEDA 17 Organizing Committee

- | | |
|----------------------------------|--|
| 1. Mr. Benson Banda | President, SMASE-Africa |
| 2. Prof Sarifa Fagilde | Vice President, SMASE-Africa |
| 3. Mrs. Jacinta Akatsa | Executive Secretary, SMASE-Africa |
| 4. Mrs. Mary W. Sichangi | Treasurer, SMASE-Africa |
| 5. Dr. Mulambe Sylvester | Chair organizing committee /Director Policy, MOE |
| 6. Mrs. Lydia Muriithi | Deputy Director, CEMASTEIA |
| 7. Mr. John Odhiambo | Chair, Hosting Committee, CEMASTEIA |
| 8. Prof. George O. Orwa | JKUAT |
| 9. Dr. Sam Ngaraiya | MOE, Kenya |
| 10. Ms. Shirley Koriana | AFEW Kenya |
| 11. Dr. Miheso- O' Conner MK | Kenyatta University |
| 12. Ms. Winfred M. Sila | KEPSHA, National Office |
| 13. Ms. Teresia Nyawira | NACOSTI |
| 14. Ms. Nyokabi Njuguna | Impacting Youth Trust and Siemens Stiftung |
| 15. Ms. Caroline Muteti | Impacting Youth Trust and Siemens Stiftung |
| 16. Mr. Martin Mburu | Kenya Private Schools Association |
| 17. Mr. Daniel Juma Omondi | Director, Global Peace Foundation |
| 18. Ms. Margaret Kamau | Education Development Trust |
| 19. Dr. Evanson M. Muriithi | University of Nairobi |
| 20. Dr. Roselyn Marandu-Kareithi | Director, Allan & Gill Philanthropy |
| 21. Mr. Charles Kimathi | The Standard Media Group |
| 22. Ms. Margaret Muigai | Juja Preparatory Schools |
| 23. Mr. Kelvin O. Onchong'a | FAWE Regional Secretariat |
| 24. Ms. Caroline Ng'ang'a | Rusinga Schools |
| 25. Ms. Beatrice Otieno | KESSHA, National Office |
| 26. Ms. Jane Mbora | Jamii Telecommunications |
| 27. Mr. Martin Mungai | Secretariat, CEMASTEIA |
| 28. Mr. Thuo Karanja | Secretariat, CEMASTEIA |
| 29. Mr. Gregory Njogu | Secretariat, CEMASTEIA |
| 30. Mr. Philip Maate | Secretariat, CEMASTEIA |
| 31. Ms. Winfred Magu | Secretariat, CEMASTEIA |
| 32. Ms. Mercy Macharia | Secretariat, CEMASTEIA |
| 33. Mr. Isaac Gathambiri | Secretariat, CEMASTEIA |
| 34. Ms. Priscilla Ombati | Secretariat, CEMASTEIA |
| 35. Isaac Gathambiri | Secretariat, CEMASTEIA |

ABOUT SMASE-AFRICA ASSOCIATION

The Strengthening Mathematics and Science Education in Africa (SMASE-Africa) is Pan-African Organization registered in Kenya under section 10 of the Societies Act. Currently, the organization has a membership of 27 countries. The Secretariat and headquarters of the association are located in Nairobi, Kenya at the Centre for Mathematics, Science and Technology Education in Africa (CEMASTE) with an office in Kenya Science Campus along Ngong road.

The Association was created early 2001 formerly as SMASE-Western, Eastern, Central and Southern Africa (WECSA) to create synergy in addressing challenges facing mathematics and science education in African countries. The Association brought together 35 African countries during annual regional conferences but has a membership of 27. The aim was to promote dialogue, sharing collective learning and collaborative action. Member countries promote promising classroom practices in enhancing the quality of mathematics and science education by developing teacher capacities and collaboratively learning together from each other's practices.

The Governments of Japan and Kenya and other development partners supported SMASE-Africa to provide a platform for networking and capacity building for its members. The activities of SMASE-Africa include promoting teacher capacity development programmes, technical workshops and conferences, and technical exchange visits and research work. Since its inception, over 1,800 educators from 27 countries in Africa have benefited from the training programmes. SMASE-Africa also has successfully organized 13 regional conferences and three technical workshops.

Vision: *"A leading organization in promoting effective classroom practices for quality education in Africa"*

Mission: *"To promote effective classroom practices in primary and secondary mathematics, science and technology education through research, fostering relevant policies, networking, collaboration, advocacy and teacher capacity development in*

Africa”

DRAFT

ABOUT COMSTEDA 17

Conference for Mathematics, Science, and Technology Education in Africa (COMSTEDA) is the conference name adopted by SMASE – Africa for its premier conference in science and mathematics education. The name provided a paradigm shift to the conference focus from; predominantly policy dialogues to providing a forum where researchers in the education sub sector and in particular STEM education in Africa and elsewhere converge and present, practical and evidence-based discussions on experiences in teaching and learning.

COMSTEDA 17 provides a platform for educators to interrogate issues, share ideas on best and promising practices, and challenges relating to teaching and learning of mathematics, science and technology education in respective countries and contexts with a view to improving the quality of education. COMSTEDA 17 brings together educators, policymakers, researchers, teachers, NGOs, public/private sector stakeholders to present papers along the five conference thematic strands.

Message: Mr. Benson Banda, President SMASE-Africa



I sincerely welcome you all to The 17th Regional Conference on Mathematics, Science, and Technology Education in Africa (COMSTEDA 17). We are delighted that you could find time from your busy schedules develop papers and also attend this conference. Last year we had a successful conference hosted by Government of Botswana which attracted an attendance of about 298. It takes time

and resources to produce these conferences and let me, therefore, thank the Government of Kenya through the Cabinet Secretary, Ministry of Education, and Director CEMASTE A for accepting to host COMSTEDA 17. The theme for the conference is '*Teacher Professional Development in Africa: Knowledge, Skills, and Values in STEM Learning Environments.*'

As you are all aware, there are tremendous social, economic and technological changes happening across the globe. Many nations are therefore changing their education systems and curriculums to respond to these changes. Save for education policies, curriculums, and educational leadership; teachers are a critical constant factor in all education systems that determine learning outcomes just as the old adage goes 'no nation can rise above the quality of her teachers.' It's therefore very fitting that the focus of this conference is on teacher professional development in the contexts of STEM learning environments.

At SMASE Africa we are delighted to note that amidst us in this conference are many classroom teachers. Indeed, this is their conference. The subthemes of this conference also resonate with the United Nations Sustainable Development Goal (SDG) Goal #4 on *Ensuring inclusive and equitable quality education and promote lifelong learning opportunities for all*. I assure you that this is a rich forum to enable us start listening to ourselves and interrogate practices and experiences from different contexts and perspectives. Presentations in this conference are aligned to five thematic strands namely; (1.) Teacher Professional Development in Africa: Developing Knowledge, Skills, and Values in STEM Learning/Teaching Engagements; (2.) Role of Professional Associations in STEM Teaching And Learning; (3.) School Culture and Learning in STEM; (4.) Curriculum Development Implementation and Assessment; and (5.) ICT Integration in STEM Education.

Gratitude to all sponsors, partners, exhibitors, and delegates for according us necessary support and participating in this conference. Last, but not least my appreciation to the SMASE-Africa Secretariat and COMSTEDA 17 organizing committee for working tirelessly to make this conference a success.

Thank you all!

Benson Banda

President, SMASE-Africa Association /
Director, National Science Centre, Zambia

Welcome Message: Mrs. Jacinta L. Akatsa, Executive Secretary SMASE-Africa



I take this opportunity to welcome you all first to the Centre for Mathematics, Science and Technology Education in Africa (CEMASTEA) and secondly to the 17th Regional Conference on Mathematics, Science and Technology Education in Africa (COMSTEDA 17) whose theme is, *'Teacher Professional Development in Africa: Knowledge, Skills, and Values in STEM Learning Environments.'*

The theme of this conference resonates well with the aspirations of the centre in spearheading quality Science, Technology, Engineering and Mathematics (STEM) Education in Kenya and Africa. According to Agenda 2063 of the African Union Commission, we aspire to be a prosperous continent based on growth and sustainable development with well-educated and skilled citizens, underpinned by science, technology and innovation for a knowledge society. I therefore, on behalf of SMASE-Africa and CEMASTEAs, pledge continued support to transforming education in line with the 2030 Global Agenda and Africa's Agenda 2063.

I dream of a future where youth enjoy learning STEM subjects encouraged by teachers that innovatively teach and equip them for the 21st century labor market. Leadership that creates an inviting school climate, attractive extra-curricular activities such as science parks and clubs, rewarding innovations and creativity, facilitating implementation of incubator projects and mentorship programs, and embedding contextualized scientific knowledge and culture.

In the course of the conference, it is expected that collaborative partnerships will be established to promote effective STEM education for sustainable development. Take time to enjoy Kenyan hospitality and especially the beautiful city of Nairobi. Near here you can visit the giraffe centre and Nairobi animal orphanage and safari walk. You could extend your stay to visit other places to sample our rich culture heritage and natural beauty.

I take this opportunity to thank you all for honouring CEMASTEAs to be your host. Karibuni sana!

Mrs. Jacinta L. Akatsa

Executive Secretary, SMASE-AFRICA /
Director – CEMASTEAs, Kenya

CONFERENCE PROGRAMME

ARRIVAL

Day/Date/Time	Activity	Section / Person Responsible
14 th /15 th Dec., 2019	Arrival, registration and collection of conference materials	House Keeping – Mary Namunyak

PRE-CONFERENCE EVENTS

16 th Dec., 2019 8:00 -8:30	Registration	Communication and registration sub-committees (Ms. Winnie Magu)
8:30- 10:30	Siemens Stiftung & Impacting Youth Trust	Partner Organization (Ms. Nyokabi Njuguna)
10:30 -11:00	Health Break	
11:00 -13:00	Allan & Gill Philanthropy	Partner Organization (Dr. Roselyn Kareithi)
13:00 -14:00	LUNCH BREAK	
14:00 – 16:00	Kenya Aviation School (TBC)	Partner Organization

CONFERENCE SESSIONS

17 th Dec., 2019 07:30-08:00	Registration	Communication and registration sub-committees (Ms. Winnie Magu)
08:00-08:45	STEM Lesson 1 Demonstration Mr. Isaac Ondieki Nairobi Secondary School	Session Moderator: Priscilla Ombati
08:45:09:35	STEM Lesson 2 Demonstration Teachers Joyce & Symon Mukarara Primary School	Session Moderator: Thuo Karanja
09:35-10:05	Panel discussion on lessons	Session Moderator: Thuo Karanja Panelists: MSichangi, NNjuguna, POmbati, PMaate, Dr. Miheso, MMacharia, PKogolla
10:05 – 10:30	HEALTH BREAK	
10:30-10:55	Opening Ceremony	MSichangi, CEMASTE A
10:55 – 11:05	Photo session	Communication and registration sub-committees (Ms. Winnie Magu)
11:05-12:35	Ministerial Round Table	AUC Representative
12:35 – 13:10	Key Note Address	Dr. Muavia Gallie
13:10-14:00	NETWORKING LUNCH	
14:00-14:10	Guidelines on Break-Away Sessions	Mr. John O. Odhiambo; Chair, Hosting Committee

BREAK AWAY SESSIONS

	STRAND / ROOM	Moderator	Rapporteur
14:10 – 17:00	Strand 1 Sugiyama Hall Teacher Professional Development in Africa: Developing Knowledge, Skills ,and Values in STEM learning/teaching engagements <ol style="list-style-type: none"> Effects of Students Teacher Ratio on Academic Achievement: A case of Selected Government and Private Schools in North-East Region, Botswana - Bokani Mbakile, Tashatha Secondary School Exploring the use of language at the 3rd Space in an Inclusive Botswana Junior Secondary School Science Classroom: Case of Dithejwane Junior Secondary School - Duncan Darkie Segabo Science trainee teachers' voices during Teaching Practice: Case of Molepolole College of Education- Isabella P. Ntsabane-Makgatswana, Molepolole 		

	<p>College of Education, Botswana</p> <ol style="list-style-type: none"> 4. <i>Promoting continuous teacher professional development through School Based INSET: The Dagoretti Lesson Study Model Approach</i> – Paul Waibochi, CEMASTE A 5. <i>Intergrated Approaches in Physics Pedagogy; Active Learning Strategies In Physics Teaching</i> - Ochieng' Obonyo. Bishop Okoth Girls Mbaga Secondary School 6. <i>The Innovative Teacher a Pinnacle of the 21st Century Learner-Centred Teaching of Science</i>. -Tawana Nancy Chaba, Kagiso Senior Secondary School, Botswana 7. <i>Teacher Professional Development: Equipping Science Teachers with Necessary Constructivist Classroom Skills</i>- Onalenna Masi Sithole¹, Nanogang School, Shanah Mompoloki Suping², University of Botswana 8. <i>A survey on ICT Integration implementation: A case of Schools in North East Regional Operations for Education in Botswana</i> Mr Mmoloki Dithebe¹, Makgadikgadi Junior Secondary School, Dr. Spar Mathews², Ministry of Basic Education, Botswana 9. <i>Influence of cooperative learning strategies used by the teacher on students' abilities in public secondary schools in Buuri East Sub County, Meru County in Kenya</i>- Kirimi Newton Kiogora, Jomo Kenyatta University of Agriculture and Technology 		
	<p>Strand 2: Mathematics Room Role of Professional Associations in STEM Teaching and Learning</p> <ol style="list-style-type: none"> 1. <i>An investigation on the teaching and learning of science in primary schools: A case study of three selected schools in Molepolole</i>- One Bettie Rantshabeng 2. <i>Competence-based curriculum implementation in chemistry: Head teachers' perception on teaching technique</i>- Mr Byusa Edwin¹, Dr Kampire Edwige ², Dr. Mwesigye Rwekaza Adrian ³ 		
	<p>Strand 3: Chemistry Room School Culture and Learning in STEM</p> <ol style="list-style-type: none"> 1. <i>Challenges faced by standard six teachers in teaching science in primary school in Botswana: a case of Tutume west inspectorate area</i>- Mr. Bulukanin Mmongwa 2. <i>Facilitating STEM education for Vulnerable School Children through Library Outreach: the Children Centre Linkages</i>- Onyebuchi, Grace Onyebuchi¹, Obim Ify Evangel² 3. <i>Women in leadership, Gender Bias in ICT leadership in Botswana's Schools-The case of the Central Region</i> -Ms Tshepo Sharon Leepile Baipusi, Mothamo Junior School Botswana 4. <i>Is Botswana education system inclusive of learners with special educational needs? A case study of four junior secondary schools in the Serowe Palapye Sub Regions</i> - Ms Olga Taolo, Mmaphula Junior Secondary School Botswana 5. <i>Influence of Politicism on Institutional Leadership in Public Secondary Schools in Kajiado County, Kenya</i> - 		

	<p>John N. Purdul</p> <p>6. <i>School Culture And Learning in STEM Leadership for Learning: Case Studies on Support and Supervision</i> - Mr. Kipkoech Kitur¹, Kitala Secondary School, Mr. Wanyonyi S. Kisaka², Raganga Secondary School</p> <p>7. <i>Undrowning high school female students' voices in the quest to promulgate STEM education</i> Authors: Dr. Lucy A. Wakiaga¹, Dr. Beatrice Ndiga², Tangaza University College</p> <p>8. <i>The Preparedness of Teacher Trainers in STEM Skills at Higher Institution of Learning</i> - Shathani Rejoyce Orapeleng, Molepolole College of Education, Botswana</p> <p>9. <i>Issues relating to inadequate girl-child participation in STEM learning and related activities in Zambia.</i> - Benardicto Ng'oma, Kwame Nkrumah University, Ghana</p>		
	<p>Strand 4: Physics Room STEM Curriculum Development Implementation and Assessment</p> <p>1. <i>Challenges of teaching Computer Aided Design (CAD) and Computer Aided Manufacture (CAM) in Botswana's Senior Secondary Schools</i> - Patrick Tlalelo Mmokele</p> <p>2. <i>Assessing Impact of revised curriculum on achievement-levels of grade twelve pupils in mathematics of five selected secondary schools in Lusaka province, Zambia</i>- Chingi Samuel</p> <p>3. <i>A review of the lessons learnt from learners through the implementation of the Experimento to program in low income public primary schools in Nairobi County-Kenya</i> – Ms. Nyokabi Njuguna- Impacting Youth Trust and Siemens Stiftung</p> <p>4. <i>Modeling Simulations on Individualized Learning in Chemistry Curriculum on Students' Achievement in Bungoma County, Kenya: Structure and Bonding.</i>- Anthony S. Mabele ¹, Sarah N. Likoko ², Kenya</p> <p>5. <i>Pre-Service Mathematics Teachers' Attained Knowledge of the Tangent Function</i>, Dr Priestly Malambo, University of Zambia, Zambia</p> <p>6. <i>Factors contributing to failure of topic time in mathematics in rural primary schools of Botswana: A case of Gamodubu Primary School</i>, Kaone Bakokonyane¹, Mojwadi Gosiame², Judith Mokgoko ³, Ministry of Basic education</p> <p>7. <i>Exploring Lecturers' understanding of Outcomes-Based Mathematics Education Syllabus in selected Colleges of Education, Zambia.</i> Mungalu Arthur¹, Charles Lwanga College of Education, Ndhlovu Zanzini², University of Zambia</p> <p>8. <i>Rhetoric and reality of postmodernism in Mathematics Education: The implementation versus performance in the Botswana general certificate of secondary education mathematics curriculum</i>, Alfred Bhusumane, Botswana Teachers Union, Botswana</p>		
	<p>Strand 5: Biology Room ICT Integration in STEM Education</p> <p>1. <i>Exploring the perceptions of secondary school learners</i></p>		

	<p><i>about Social media for learning Mathematics in Kabwe District, Zambia - Maureen K Kanchebele-Sinyangwe</i></p> <ol style="list-style-type: none"> <i>Locally Developed Content is Key for Effective Integration of ICT in Education, Gilbert Gift Siima, National Curriculum Development Centre Uganda</i> <i>Effects of Open Educational Resources (OERS) Videos In A Blended Physics Classroom, Onesmus Gicheru, Embakasi Girls, Kenya</i> <i>Student Involvement in Creating Learning Content for ICT Learning, Kellen Kawira Riungu Muthambi Girls High Sch., Kenya</i> <i>Evaluation of the success of African Digital Schools Initiative (ADSI) project in Science, Technology, English and Mathematics (STEM) teaching and learning in Transmara East Sub-county ADSI schools, Narok, Mr. Leonard Kipkirui</i> <i>Teaching and Learning with Technology: Effectiveness of ICT Integration in Science, Technology, English and Mathematics (STEM) in ADSI Schools in Narok County. Mr. Leonard Kipkirui</i> <i>Integration of Technology in English Language Teaching and Learning in Secondary Schools in Kisumu County, Molly A. Ogolla, Kenya</i> <i>The Use of a Recommender System in Placement of Students in STEM Learning, Daniel N. Njeru, Zetech Univerisity, Kenya</i> 		
17:00-18:00	Cocktail /Reception		
18th Dec., 2019	Registration	Registration Desk	
08:00-08:30			
08:30-09:15	Key note Address	Dr. Tonny Omwansa	
	STRAND / ROOM	Moderator	Rapporteur
09:15 -10:30	<p>Strand 1 Sugiyama Hall Teacher Professional Development in Africa: Developing Knowledge, Skills and Values in STEM learning/teaching engagements</p> <ol style="list-style-type: none"> JICA Round Table discussion, Panel Discussion on the theme, <i>Clues to Foster Students' Mathematics and Scientific Literacy in Sub-Saharan Africa: Experience of Technical Cooperation Projects of JICA in Mozambique, Rwanda and Zambia</i> <p>Strand 2: Mathematics Room</p> <ol style="list-style-type: none"> <i>Effect of Lesson Study on Students' Performance: The case of secondary mathematics students in the rural-mountainous area in Lesotho, Mamocheta Makara¹, Nkoja Khechane², Faculty of Science, Lesotho College of Education</i> <i>Nurturing Chemistry Learners' Curiosity in a Hands-On Learning Environment, Esther S. Kibga, University of Rwanda-College of Education, African Centre of Excellence for Innovative Teaching and Learning of Science and Mathematics (UR-CE, ACEITLMS)</i> <p>Strand 3: Chemistry Room School Culture and Learning in STEM</p> <ol style="list-style-type: none"> <i>School culture and learning in stem: creating space</i> 		

	<p><i>for in/out of school stem learning and application, Peter M. Ndiritu, Mt. Kinangop Girls Secondary School, Kenya</i></p> <p>2. <i>Investigating the role of departmental heads as a crucial lever in effective curriculum delivery in south African secondary schools – the case for mathematics and physical science, Phillip Dikgomo, South Africa</i></p> <p>Strand 4: Physics Room STEM Curriculum Development Implementation and Assessment</p> <p>1. <i>Enhancing the teaching and learning of Mathematics in junior secondary schools in Botswana using STEM learning. Ms. Lillian Mosweu, Department of Mathematics, Molepolole College of Education, Botswana</i></p> <p>2. <i>Facilitating or strengthening STEM teaching for student teachers at Secondary Colleges of Education. Ms. Lillian Mosweu, Department of Mathematics, Molepolole College of Education, Botswana</i></p> <p>Strand 5: Biology Room ICT Integration in STEM Education</p> <p>1. <i>Integration of Technology in English Language Teaching and Learning in Secondary Schools in Kisumu County, Molly A. Ogolla ,Kenya.</i></p> <p>2. <i>Application of Information Communication Technology Resources: Its Effect on Science, Technology, Engineering and Mathematics Learning in Selected Public Polytechnics in Edo and Delta States of Nigeria. CHRISTIANA F. OZOKERAHA, Department of Statistics, Delta State Polytechnic, Nigeria</i></p>		
10:30-11:00	Health Break		
	STRAND : ROOMS	Moderator	Rapporteur
11:00-13:00	<p>Strand 1 Sugiyama Hall Teacher Professional Development in Africa: Developing Knowledge, Skills and Values in STEM learning/teaching engagements</p> <p>1. <i>Effect of Teachers' Characteristics on Learners' Academic Outcomes in Secondary Schools: Focus on Lesson Study in Kenya, Mr. Acharo Benard Otieno, Kenya</i></p> <p>2. <i>Do Primary Teachers' Assessment Practices in Lesotho inform learners' learning of Mathematics? Nkoja Khechane¹, 'Mamocheta Makara², Faculty of Science, Lesotho College of Education</i></p> <p>3. <i>Promising Approaches in Teacher Professional Development: Strengthening Inclusive And Innovative Pedagogies, Mr. Kipkoech Kitur, Kitala¹ Secondary School, Mr. Wanyonyi S. Kisaka, Raganga² Secondary School, Kenya</i></p> <p>4. <i>Use of modern approaches of STEM education instruction to match 21st century skills: A case study of the Experimento Program approach, Irene N. Gisemba et al, Impacting Youth Trust and Siemens Stiftung, Nairobi</i></p> <p>5. <i>Analysis of the level of preparedness for secondary</i></p>		

	<p><i>school teachers in STEM teaching for the Competency Based Education: A case of Bungoma County, Kenya, Wakasiaka Eliud Mwichabe¹, Sylvanus Watenga², Prof. Julius Maiyo³, Dr. Jane Barasa⁴</i></p> <p>6. <i>Challenges Faced by Integrated Science Teachers in Zambian Secondary Schools (A Case Study of Kabwe District)</i>, Ivy Bweupe, Kwame Nkrumah University, Zambia</p>		
	<p>Strand 1: Mathematics Room Teacher Professional Development in Africa: Developing Knowledge, Skills and Values in STEM learning/teaching engagements</p> <ol style="list-style-type: none"> 1. <i>An Examination of the "Situation" of Real Life Application Component of the Rationale during Mathematics Lesson Delivery</i>, Hamankolo M. Ngulube, Lecturer, Mathematics Education Department, Kwame Nkrumah University 2. <i>An Evaluation of the Humanizing Effect of Lesson 'Study' Practice by Science Teachers in Kabwe district, Zambia</i>. Mudenda V. Lecturer, Kwame Nkrumah University, Zambia 3. <i>Influence of Smasse on the Quality of Teaching and Learning of Mathematics and Sciences in Public Secondary Schools in Bungoma County</i>. Dr Josephine N. Ojiambo, PhD, Moi Girls High School, Kenya 4. <i>An Assessment of SMASE In-service Education Training on Teachers' and Pupils' participation and Academic performance in Mathematics and Science Education</i>, Hafsah, Dr. Lawal Kontagora, SMASE INSET Centre, National Teachers' Institute, Kaduna-Nigeria 5. <i>Intersection of Religion and Science: The Influence of Christian Values on STEM</i>, Caroline Noel Amunga, Masinde Muliro University of Science and Technology, Department of Social Sciences Education, Kenya 6. <i>Why STEM needs Philosophy</i>, George Nyongesa, University of Nairobi, Kenya 		
	<p>Strand 3: Chemistry Room School Culture and Learning in STEM</p> <ol style="list-style-type: none"> 1. <i>Conceptualizing an ideal Inclusive Classroom for the 21st Century: Implications for Teachers of Mathematically Gifted Learners [MGLs]</i>, Michael K. Mhlolo, Central University of Technology, South Africa 2. <i>Challenges Faced by Teachers in Teaching Science to Deaf Children in the Mainstream Schools in Developing Countries</i>, Ziphorah N. Katunga, Special School for the deaf, Makongo, Kenya 3. <i>Female Participation, Progression and Achievement in STEM Require Education-System and Career Mentorship Improvement</i>, Dr Rose Atieno Opiyo, Masinde Muliro University of Science and Technology 4. <i>The preparedness of teacher trainers in stem skills at higher institution of learning</i>, Shathani Rejoyce Orapeleng, Molepolole College of Education, Botswana 		
	<p>Strand 4: Physics Room STEM Curriculum Development Implementation and Assessment</p> <ol style="list-style-type: none"> 1. <i>A review of the lessons learnt from learners through</i> 		

	<p><i>the implementation of the Experimento program in low income public primary schools in Nairobi County-Kenya, Nyokabi Njuguna, Impacting Youth Trust and Siemens Stiftung, Kenya</i></p> <ol style="list-style-type: none"> <i>Junior secondary school teachers' pedagogical practices in teaching algebraic equations: A case of four schools in South East Region, Botswana, End Salani¹, Department of Primary Education, University of Botswana</i> <i>Colla-Petitive Strategy for Collaborative Learning Environment in Schools. Cyrus Muigai Kihara¹ JKUAT, Kevine Otieno² Egerton University, Rose Masese³ CEMASTE, Kenya</i> <i>Effect of Lesson Study on Students' Performance: The Case of Secondary Mathematics Students in the Rural-Mountainous Area in Lesotho. Mamocheta Makara, Lesotho</i> <i>The formula for the image point (p,q) of the object point (a,b) in the mirror line $y = mx + c$. Harris M. Kariuki, St. Joseph's Kirima S.S, Kenya</i> <i>Profiling STEM teachers' qualifications in Botswana: a fundamental step to implementing SDG4, Prof. Kgomo¹ G. Garegae¹; Mr Ofentse P. Phale², University of Botswana, Botswana</i> 		
	<p>Strand 5: Biology Room ICT Integration in STEM Education</p> <ol style="list-style-type: none"> <i>Effects of ICT Integration in STEM Education as Resource and Solution in learning Among Secondary Schools in Kenya, Rose Khamusali Okwemba, Moi Girls' High School-Eldoret, Kenya</i> <i>The effects of computer simulated experiments on students conceptual understanding of Acids and Bases: A case of two form 2 classes in South East Region, Messiah Matsapa, Marulamantsi JSS, Ministry of Basic Education, Botswana</i> <i>Challenges Facing The Implementation of Nepad Pilot E-Schools' Initiative in Kenya , Kennedy W Mumali, Kenya</i> <i>Demonstration of an ICT learning resource, Elijah M. Kamau, Ndururumo high school, Kenya</i> <i>Analysis of the level of ICT integration in STEM Education secondary schools in Kenya: A case of Bungoma County, Kenya, Sylvanus Watenga¹, Wakasiaka Eliud Mwachabe², Prof. Julius Maiyo³, Dr. Jane Barasa⁴, Kenya</i> <i>Visualization processes in conceptual teaching of word problems in grade 9 mathematics classes, Clemence Chikiwa¹, Rhodes University, Bernard J. Ssenyomo², KP Toto High School, South Africa</i> 		
13:00-14:00	NETWORKING LUNCH		
14:00- 16:00	<p>Strand 1 Sugiyama Hall Teacher Professional Development in Africa: Developing Knowledge, Skills, and Values in STEM learning/teaching engagements</p> <ol style="list-style-type: none"> <i>Enhancing Collaborative Activities among College of Education, Collaborating Schools and Education Support Teams in Zambia, Yumi Sekiguchi, Edward Tindi, National Science Centre, Ministry of General</i> 		

	<p>Education, Lusaka</p> <ol style="list-style-type: none"> 2. <i>Education for sustainable development through teacher professional development: lessons from the SMASE program of Kenya</i>, Dr. Grace N. Orado, Dr. Njoroge, J. M, Akatsa, J. L 3. <i>The Incorporation of GeoGebra as a Visualisation tool to teach Calculus in Teacher Education Institutions: The Zambian case</i>, Lemmy Kangwa¹, Chalimbana University, Prof. Marc Schafer², Rhodes University 4. <i>The Effect of Microscale Experiments on Secondary School Science Teachers' Self-efficacy in Malawi</i>, Cedric MpasoMinistry of Education, Science and Technology, Malawi 5. <i>Symposia as avenues for teachers to reflect on their practice</i>, Ngeny K.E, CEMASTE A 		
	<p>Strand 1: Mathematic Room Teacher Professional Development in Africa: Developing Knowledge, Skills, and Values in STEM learning/teaching engagements</p> <ol style="list-style-type: none"> 1. <i>School Based Continuous Assessment in Chemistry Practical Learning: A Case Study of Zambian Education System</i>, Masiliso Kabui, Ministry of Basic Education 2. <i>Exploring Factors Affecting Students' Attitude towards Mathematics: A Case of Mayuge District in Uganda</i>, Marjorie S K Batiibwe¹, Caroline Taliba², Betty K Nannyonga³, Carla Puglia⁴, Makerere University; Uganda Ministry of Education and Sports; International Science Programme 3. <i>The constitution of a mathematics explanation in Botswana secondary schools</i>, Chako G. Chako, Ministry of Basic Education, Botswana 4. <i>ICT Integration in Teacher Professional Development</i>, Berthasia R. Mwitory, Shule Direct 5. <i>Difficulty in syllabus objectives interpretation of Junior Certificate Science Syllabus</i>, Pelotlhomogi Modise, Bakgatle Junior Secondary School, Botswana 		
	<p>Strand 4: Physics Room STEM Curriculum Development Implementation and Assessment</p> <ol style="list-style-type: none"> 1. <i>Causal factors and impact of workplace injuries on teachers' performance: The case of Design and Technology in Botswana</i>, Mukuba University, Michael Gaotlhobogwe and Mojawadi L. Gosame 2. <i>Quantum Mechanics Symbology: How does it affect students' understanding of Introductory Quantum Mechanics concepts?</i> Kwaleyela Kwaleyela, Mukuba University 3. <i>Procedural and Conceptual Understanding of Specific Concepts by First Year Mathematics Students' at The University of Zambia</i>, Mwape John, Solwezi Boys' Technical Secondary School 4. <i>A Comparative study on teacher education systems and practices in SADC countries: implications for SADC teacher education protocol</i>, Prof. Kgomo tso G. Garegae¹; Ms Salome M. Mogotsi², University of Botswana, Botswana 		

	5. <i>ASEI/PDSI Principles on Biology Subject in Taita Taveta County, Roseline M. Osugo , Kenyatta university, Dr. Ephantus M. Kaugi, Kenyatta University</i>		
	Strand 5: Biology Room ICT Integration in STEM Education 1. <i>Workshop Proposal on Resources and Solutions for STEM learning using various ICT tools, Mr Moagedi Kereeditse¹, Ms TebogoMolebatsi²,Kgale Hill Junior Secondary School, Botswana</i>		
	Strand 4: Biology Room STEM Curriculum Development Implementation and Assessment 1. <i>Pre-service Teacher Education in Mozambique: For Effective Natural Sciences Teacher Development, Remane Selemene, Yuma Takebe, Ryuichi Sugiyama, Ministry of Education and Human Development, Mozambique; Koei Research & Consulting Inc; PADECO Co., Ltd. Mozambique</i> 2. <i>The Case of an Evidence-based Learning, Sungae, S. S., Son, Tinker Education Ltd</i> 3. <i>Examining the Connection between Mathematics and Science at the Secondary School Level in Malawi: Focusing on the Level of Integration, Justus Nkhata, Ministry of Education, Science and Technology, Malawi</i>		
16:00 – 16:15	HEALTH BREAK		
16:15 – 18:00	Giraffe Centre Tour		
19th Dec., 2019 08.00-08:30	Registration	Registration Desk	
8.30 – 9.15	STEM Education in Africa: A dream in the Horizon!	Ms. Mary Sichangi & Mr. Shem Bodo	
09.15-10:30	Panel Discussion: Indigenous Knowledge and STEM	Moderator: Dr. Miheso, Panelists: Mrs. Jacinta Akatsa, Dr. Beatrice Njenga, Prof. Orwa, Prof. Genevieve Wanjala, Mr. SNjoroge	
10:30-11:00	Health Break		
11:00 -13:00	STRAND : ROOMS	Moderator	Rapporteur
	Strand 1 Sugiyama Hall <i>Teacher Professional Development in Africa: Developing Knowledge, Skills and Values in STEM learning/teaching engagements</i>		
	Strand 3: Chemistry Room <i>School Culture and Learning in STEM</i>		
	Strand 4: Physics Room STEM Curriculum Development Implementation and Assessment		
	Strand 5: Biology Room ICT Integration in STEM Education 1. <i>ICT Integration in STEM Education, John Chumo, Chebara Girls Secondary School, Kenya</i>		

	2. <i>Use of Cellphones as Learning Devices by Schools</i> , Phillip M. Kalanke, Department of Basic Education, Gaborone Botswana (Panel Discussion for 1½ hours)	Panelists: Martin Mungai, Kenya,	
13:00 -14:00	NETWORKING LUNCH		
14:00- 13:30	Closing Ceremony		
13:30	Guests Leave at their own pleasure		

SMASE-AFRICA ANNUAL DELEGATES MEETING

20 th Dec., 2019 08.30 – 13.00	Sugiyama Hall SMASE-Africa Delegates Meeting	Mr. Benson Banda, President SMASE-Africa
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