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CEMASTEA INFO

Newsletter

Resilience & Continuity



Editorial

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It is now almost a year and a half since the unfortunate advent of the COVID-19. It indeed has been one very scary and anxious moment globally, with everyone wondering what would happen to their lives and those of their loved ones. While the effects of the pandemic will be with us for a while, the need for an organisation to offer business continuity cannot be gainsaid. There is a lot of optimism globally on building back better, especially in critical subsectors and systems such as health and education. One of the lessons learnt from this crisis is the importance for individuals and institutions to have the ability to respond to unexpected risks quickly. CEMASTEA continues to build structures for providing its service.



In this issue, we highlight CEMASTEA activities in providing business continuity in its Teacher Professional Development (TPD) programmes. This includes National INSET for County Trainers for primary and secondary programmes, ICT integration and sensitisation workshops for school leaders. One running theme in all the programmes was building into school systems structures for continuity of business and resilience with the exploitation, digital space taking centre stage. Indeed, all these programmes were implemented using online platforms. Delivering on this promise has taken leadership, teamwork, collaboration and a continuous plugging back of lessons learnt from every cohort of training. We also report on the Centre's participation in the national road safety week, corporate social responsibility and numerous opportunities for staff to learn and build their skills and competencies.

I take this opportunity to thank all those who took their time to write articles for this issue of the newsletter.

Once again, enjoy your reading and do not hesitate to give us feedback on any of the stories. Kindly use the link <https://forms.gle/RkXNWXQ3ehEsqhr48> to share your feedback.

Thuo Karanja, Editor

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Picture in the front page was taken at Eliyee Primary School in Turkana North during data collection for the School Based Teacher Support System (SBTSS) research. This was a science lesson on simple pulleys, with elements of patriotism with teacher using place base learning pedagogy.

Beside: Test for starch on a variegated leaf. Areas with blue black colouration shows presence of starch, with the brown coloured patches showing negative results

Message from the Director



Welcome to this issue of the CEMASTEA Info Newsletter. CEMASTEA has demonstrated resilience amid the challenges brought about by COVID-19. Since the pandemic started, the Centre has innovatively navigated the challenges of the pandemic to offer continuity of its training programmes. The Centre has successfully rolled out its Teacher Professional Development (TPD) programmes and school leaders' sensitisation activities by ploughing feedback and lessons learnt from one training cohort to the next.

In April, we successfully conducted a National INSET for Primary County Trainers. The training was implemented using virtual platforms with participants gaining skills for online pedagogy and the navigation of online learning management systems like the Google Classroom and conferencing tools such as Zoom and Google Meet. They also practised strategies for promoting digital literacy in mathematics and science and reinforced their understanding of Competency Based Curriculum (CBC) concepts.

In May, CEMASTEA hosted the largest and most successful online ICT training. Over 4,500 teachers from 26 counties were trained on teaching and learning management systems for remote learning, planning, and developing ICT-integrated lessons. The Secondary National INSET for County trainers was implemented in June. This training aimed at equipping our County trainers with the requisite knowledge for managing County INSET. About 1,036 County trainers participated in this training. Other training implemented include the Principals of Inclusive STEM Model Schools (iSMS), Principals of INSET CEMASTEA Centres and County Trainer's Representatives (CTRs). Throughout the training, we received invaluable support from the Teachers Service Commission (TSC) and the Ministry of Education (MoE). In addition, their officers monitored the training and offered feedback during the daily briefings. CEMASTEA staff also received training, including Digitisation of Records, Ethics and Anti-Corruption, Customer Care, Gender Mainstreaming and HIV.

On a sad note, we lost two hard-working staff members; Mr Ernest Ngeny (April) and Mr Paul Kibanya (June). Both were valuable and loved officers who, in their prominent roles as the Dean of Physics Department and National Trainer respectively, contributed immensely to making CEMASTEA what it is today. Their legacies and impact both in leadership, training and research will be felt for years to come. May their souls continue resting in eternal peace.

CEMASTEA joins the Government in fashioning sustainable post-COVID-19 recovery strategies. We promise to continue giving teachers participating in our programmes pedagogical tools to make them even more resilient in the face of disruptions now and into the future.

Enjoy your reading. Thank you.

**Jacinta L. Akatsa, HSC,
Director, CEMASTEA**

Skills on Remote Learning

CEMASTEA conducted online ICT training for secondary school teachers from 17th-28th May. The theme of the training was: *"Enhancing Teachers Competency in ICT Integration in Teaching & Learning Using Virtual platforms"*. It was the expectation that participants would gain skills for using teaching and learning management systems for remote learning; developing digital teaching and learning resources, planning ICT integrated lessons and using virtual learning platforms to deliver online instructions. The course adopted an asynchronous mode using Google Classrooms and synchronous mode where participants had live sessions via Zoom.

CEMASTEA has been implementing this model of ICT training for the last four years wherein each consecutive year, two or three teachers in almost every school in half the counties in Kenya are trained. The participants were secondary school teachers drawn from 26 counties. A system called, "Planting a seed", is used whereby one teacher per school is trained consecutively to build a critical mass of teachers who can cause a transformation in the teaching and learning ICT. These teachers are expected to champion and model ICT integration in teaching and learning to their peers. During the 2021 training, 4,581 teachers participated out of the expected 5,259, translating to 87%. The participating teachers were from all subjects with gender representation of males at 77% while the females were at 23%. Distribution of subjects is as shown in the graphic on the right.



Skills and concepts learnt during the training included navigating the Google Classroom, sourcing and adapting digital teaching resources, creating digital teaching resources, and developing and implementing ICT-integrated lessons using the Technological Pedagogical Content Knowledge (TPACK) model. Participants also practised virtual lesson delivery Google Meet, Zoom or the Big Blue Button (BBB). The teachers appreciated these online tools and platforms as effective alternative modes of curriculum delivery. Some of the lessons learnt were that: i) ICT integration in teaching and learning is applicable in all subjects; ii) Mobile phones are powerful tools that could be useful in sourcing digital resources and in delivering ICT integrated lessons; iii) Continuous practice is required for teachers to be fully conversant with the digital platforms relevant for virtual teaching and learning; and iv) There is need to form communities of practice and support groups for continued sharing of good practices, and relevant digital learning resources and ICT integrated lessons.

Some of the recommendations from the training included the need for follow up to ensure continuous support and practice of skills learnt and the need for participants to become role models and champions in their institutions. The participants were encouraged



One of the 47 ICT Google Classrooms used for Training

to showcase their skills by participating in competitions like the ICT Teacher of Year Award (iTOYA). During the training, the Teachers Service Commission (TSC) and Ministry of Education were represented by their members of staff who monitored the training process. The County Teacher Capacity Development Committee (CTCDC) officials graced the opening and closing ceremonies. They encouraged teachers to use the skills learnt back in their classes.

Paul Waibochi & Ann Mumbi, CEMASTE A

Preparing For Improved Performance

CEMASTEA, through its Primary Schools Programme, conducted a two weeks National Online INSET from 27th April to 7th May 2021. The training theme was: *'Enhancing teachers' capacities to Implement Competency-Based Curriculum and Competency-Based Assessment through Online platforms'*. Participants in the course were County trainers from 13 counties that included; Kericho, Kiambu, Kisumu, Meru, Mombasa, Nakuru, Nyamira, Nyandarua, Nyeri, Siaya, Trans Nzoia, Uasin Gishu and Vihiga. After the course, the trainers were expected to use the 'Smart Cascade' model to train teachers in their respective counties.

The Chief Guest for the opening ceremony was the Director-General Ministry of Education, Mr Elyas Abdi represented by Mr Simon Mururi, Deputy Director and Kenya Schools and Engineering Fair (KSEF) Coordinator. In his speech, the chief guest noted that teachers have a critical role to play, prompting a need to mitigate the effects of access and quality mathematics and science education.



Director CEMASTEА, Mrs Jacinta Akatsa, Mr. Ezekiel Tumbo, Assistant Director in charge of Teacher Professional Development at TSC and Mr. Muruli of Ministry of Education.

According to him, continuous Teachers Professional Development (TPD) of teachers is essential in supporting innovation in teaching, making it critical for teachers to up-

skill themselves and build 21st century skills in the learners. In addition, he mentioned that students' attitude towards mathematics and science reflect the teacher's practices in the classroom. Teachers Service Commission Chief Executive Officer Dr Nancy Macharia, represented by Mr Ezekiel Tumbo, Assistant Director in charge of Teacher Professional Development, noted the course content was well within the TSC guidelines on TPD. Further, he pointed out that the disruption caused by the pandemic was clear evidence that face to face teaching is not adequate. Finally, he commended CEMASTEА for continuously building the capacity of teachers using innovative models like in the case of virtual classrooms.

In her remarks, Mrs Jacinta Akatsa, Director CEMASTEА, noted that the realization of Kenya's technological and social-economic development is dependent on the quality of science and mathematics education. She further said that the Kenya Vision 2030 and the Big Four Agenda are anchored on science and technology. She promised to support the participants through County Teacher Capacity Development Committee (CTCDC) to ensure that the Programme was successfully implemented at the County level to achieve improved performance in science and mathematics.



A girl reporting to the rest of the class during a lesson. A good way to developing learners confidence and communication skills

Other speakers who interacted with the participants in the training course included the Deputy Director, at CEMASTEА, Mrs. Lydia Muriithi and Ag. Deputy Director training, Mr Patrick Kogolla. They encouraged the participants to fully participate to ensure the same quality of training at the County level. Mr George Kiruja, Coordinator Primary Schools Programme at CEMASTEА, coordinated the course.

George Kiruja & Dan Orero, CEMASTEА

Online National INSET

In this day and age, being a teacher means working in a rapidly changing space with instructional techniques and delivery systems changing even faster. An ability to respond to these changes through effective use of the ever-changing technological tools within the sound pedagogical practice is essential for being an innovative teacher. The Teachers' Service Commission (TSC) has encouraged teachers to become more creative in their service delivery. Teachers are also expected by the Kenya Professional Teaching Standard (KePTS) in the TSC Teacher Professional Development (TPD) Policy Framework to use a 'variety of instructional strategies to meet individual learning needs to engage their learners effectively. To promote this, CEMASTEА, under its mandate, conducts Teachers' Professional Development activities.

In the previous years, CEMASTEА conducted SMASE Secondary National INSET sessions using the face-to-face mode. However, due to challenges associated with COVID- 19 pandemic, the 2020/2021 INSET adopted online platforms. The 2021 National INSET targeted County Trainers drawn from 47 counties. It was implemented from 31st May to 11th June. Its theme was *"Enhancing teachers' competencies in remote learning techniques for effective teaching and learning of mathematics and science."* A total of 1,142 county trainers took part in the course. County trainers

have a dual role as they are expected to cascade the training in August during the County 2021 INSET and use the skills learnt to improve their classroom practices and colleague teachers in their respective schools.

The training was aligned to the TSC TPD Policy Framework and provided a range of professional learning opportunities for teachers to enhance their Pedagogical

Content Knowledge and become reflective practitioners. Specifically, teachers were expected to strengthen their content mastery in their specific teaching subjects and improve their competencies in using ICT tools in conducting mathematics and science lessons remotely. Further, the participants enhanced their digital literacy and self-efficacy skills in using online platforms in teaching and learning. This, too, is an expectation in the Competency Based Curriculum (CBC).



A teacher with students performing hands-on activities during a chemistry lesson

Livingstone Makanda & Ann Mumbi, CEMASTEА

Giant Leap: Virtual Labs for Chemistry

Since the COVID-19 pandemic struck, it is no longer business as usual at CEMASTEА. The well-endowed, modern equipped laboratories have not been used in the everyday hustle and bustle characteristic of face-to-face and hand-on activities. However, to continue meeting the training demands for chemistry teachers, the department moved in to fill the gap using digital resources such as virtual labs, simulations and animations. Simulations are the imitation of the operation of a real-world process or system and require the use of models representing the essential characteristics or behaviours of the selected function.

During this year's virtual National INSET 2021, the department embarked on a rigorous capacity building for teachers to equip them with requisite technical skills for remote pedagogy and sourcing innovative digital materials from the web and creating their own. The department set the pace for the teachers in the creation of digital resources by modelling the practice.

Through the initiative of Dr Grace Orado, Chemistry trainer and Coordinator, Research, Development and Knowledge Management Department.

The Chemistry department produced a ten-minute video detailing skills on how to effectively perform a titration. This was to motivate chemistry teachers and assure them that they could make their materials and use them for teaching. The video, is available on CEMASTEА Educational YouTube Channel, and can be accessed at <https://bit.ly/2TIVADf>.



Dr. Grace Orado, Chemistry Dept. CEMASTEА demonstrating how to do a titration

The video clearly illustrates how to carry out a titration when physical interactions are not possible. It is expected that teachers will take up the challenge and create more resources to upload on YouTube for sharing with their learners and other teachers.

Richard Jakomanyo, CEMASTEА

Word of Encouragement

1 John 4:19-21



¹⁹ We love because he first loved us. ²⁰ Whoever claims to love God yet hates a brother or sister is a liar. For whoever does not love their brother and sister, whom they have seen, cannot love God, whom they have not seen. ²¹ And he has given us this command: Anyone who loves God must also love their brother and sister.

Alex Kimanzi, Accounts Department



And whoever puts all his trust in Allah (SWT) He will be enough for him" Surah At - Talaq 65:1-3 "So be patient indeed, the promise of Allah is truth" Surah Ar -Rum 30:60 Lamesa Bafkado, Supply Chain Department

Corporate Social Responsibility

Mobile Laboratories

Corporate Social Responsibility (CSR) is primarily a morally oriented institutional practice of contributing to social goals. CEMASTEAs has embedded a CSR culture in its programmes, with one of the most successful CSR activities being the donation of mobile laboratories to needy schools across the country. These donations are in line with CEMASTEAs mandate of strengthening science and mathematics education. More than six schools have so far benefited from these donations in 2021. The latest was Mathari Mixed Secondary School, Nairobi, where CEMASTEAs staff led by the

Coordinator, Field Services Mr Joseph K. Mathenge visited and donated one mobile laboratory in May.

At the school, the CEMASTEAs team was received by the school principal Mr John Githaiga Macharia, and

Board of Management representative, Mr John Ndugire Kamau. During his remarks, Mr Mathenge noted the importance of practical experiences in learning and understanding concepts in science. He encouraged the learners and especially girls, to pursue Science, Technology, Engineering and Mathematics (STEM) courses, noting that it

was one area that human resources for Science, Technology and Innovations (STI) are still on demand. He implored the teachers to plan lessons with more hands-on activities in sciences and mathematics and expressed optimism that the mobile laboratory would be put into good use.

On his part, Mr Macharia, appreciated the Director CEMASTEAs for the quick response in offering support. He reiterated that the mobile lab has everything required to carry out practicals; hence, the students should not have excuses for not performing well in sciences. Mr Kamau, pointed out to the



Mr Mathenge, making remarks during handing over of the Mobile lab at Mathari Mixed Secondary School, Nairobi.

learners that there was nothing strange in sciences and that they could achieve whatever they worked hard for. He appreciated CEMASTEAs for the support and also appealed for more support in future.

Ndolo Anderson, Communications Department

Gone too soon: Physics Dept. Loses Its Dean

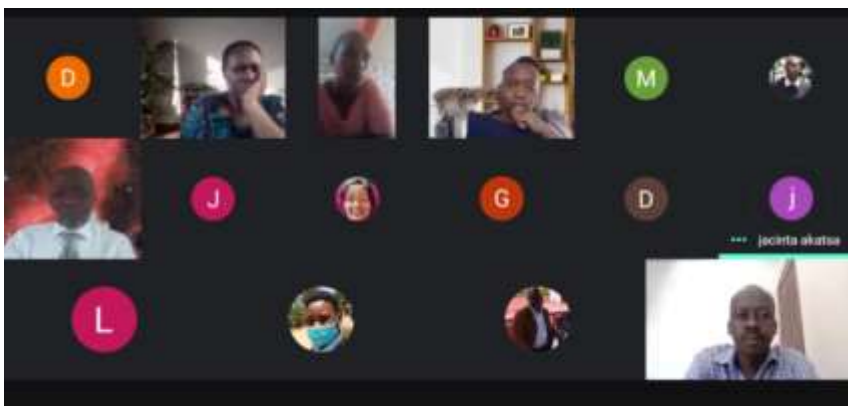


The late Mr. Ernest Ng'eny

Death showed its ugly face to CEMASTEA in April and took one of the dedicated staff, the Dean of Physics Department, Mr Ernest Ng'eny. Mr Ng'eny passed after a short illness on 11th April 2021. He rendered his services to CEMASTEA relentlessly up to the last moments of his life. This included taking leadership in writing the Physics National INSET online module for 2021 and participating in an online meeting on 10th April. Little did we know that the following day we would wake up to sad news!

Since taking up the department's leadership, Mr Ng'eny had steered Physics Department to greater heights and had ensured bonding and teamwork among the department staff. He was a team player and did not shy away from taking leadership in facilitating physics sessions, taking challenging tasks to ensure departmental objectives were achieved. Famously, he encouraged department staff to go for *mbuzi choma* in the evenings at Dagoretti corner (popularly known as Kona) to foster teamwork and bonding.

Since joining CEMASTEA in 2003 (then SMASSE UNIT at Kenya Science Teachers' College), his special leadership abilities and charismatic personality were readily apparent! It was clear that he would most likely have an outstanding career as an educational leader. He exhibited a gift of innovative thinking, a visionary spirit, and the unwavering patience required to lead meaningful academic discourse successfully. He made a mark not within CEMASTEA but also within his social circles. During a speech delivered at his funeral, a mourner remarked that in their long friendship *lingua*, he had learned a new word from Mr Ngeny, "A crocodile," which meant one thousand shillings.



Part of CEMASTEA staff during the online memorial service for the late Mr. E. Ngeny

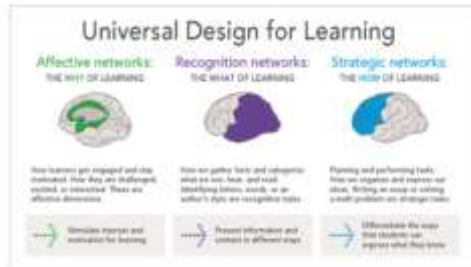
CEMASTEA staff, led by the Director, Mrs Akatsa, on 15th April held an online memorial mass to remember the fallen hero. During the service, colleagues eulogized Mr Ng'eny as a hard-working and quiet colleague who focused more on his work. During his stay at CEMASTEA, he demonstrated a love for his family and never shied from talking about their academic progress.

The Physics Department and the entire CEMASTEA family are in mourning for losing their gallant pedagogical soldier. However, we are comforted by the understanding that legends never die; they rest; so Mr Ng'eny has rested. May his soul rest in eternal peace.

Philip Maate, Ag. Dean Physics

Ualimu Bora: Universal Design for Learning

One duty of a teacher is to facilitate quality teaching to enhance meaningful learning, whatever the level of schooling. As noted in Schwab's four commonplaces of curriculum, quality teaching and effective learning processes are supported by an interaction of the four aspects; teacher, learner, subject matter and milieu. However, there is no clarity on what constitutes effective interaction of the four aspects. Teacher education programs (initial and serving) emphasise how to facilitate these interactions by exposing participants to various learning theories (e.g., constructivism), instructional frameworks or models (e.g., 5E instructional model), and teaching practices (e.g., explaining and modelling content).



Source: <http://www.buffalo.edu/ubcei/enhance/teaching/universal-design.html>, 2021

The Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 require teacher education programs to re-imagine effective facilitation of the teaching and learning process. A particular focus is strategies that empower teachers to promote SDG#4 on Quality Education. One of the emergent frameworks with the potential to facilitate this achievement is the Universal Design for Learning (UDL). UDL is a framework for instruction structured around three principles informed on the learning sciences. The first principle is about providing learners with *multiple means of representation* to enhance recognition learning.

Thinking about a teaching subject, what various means of representation can a teacher employ to promote meaningful understanding of a given concept? This principle focuses on reflecting on flexible ways to present what we teach to support meaningful learning by learners. The second principle is about providing *multiple means of action and expression* to sustain learning. Thinking about a teaching subject area, what various avenues learners can use to make explicit their mastery of concepts? This principle focuses us on reflecting on flexible options on how we learn and express what we know. The third principle is about providing learners *multiple means of engagement* to boost effective learning. Thinking about a teaching subject, how can learners be motivated to engage in meaningful learning of a given concept actively? This principle focuses us on



Stairs and combination of stairs and ramp: What building entrance demonstrates Universal Design? In the first picture the staircase cannot accommodate people with mobility challenges. Putting a ramp into the design allows both people with mobility challenges and persons with no such challenges use the ramp. People with no mobility challenges can still use the ramp.

reflecting on flexible alternatives for supporting motivation.

CEMASTEA is making commendable strides in Teacher Professional Development (TPD), particularly enhancing teachers' competencies on leveraging mobile technology to support continuity of teaching and learning process

consequent to the disruptions of face-to-face learning by COVID-19 pandemic. An example is in integrating mobile technology to facilitate teaching and learning. Teachers are exposed to the possibilities of live video recording of lessons that can then be available to students through Learning Management Systems. This is within the UDL framework, particularly the second principle. Depending on the type of mobile phone, teachers can explore various mobile applications, such as Open Broadcaster Software (OBS), that allow live recording of lessons. There is more room for growth regarding embracing UDL in the TPD programs such as the mapping in UDL principles during the design stage of TPD content. This could mitigate the misconception that UDL is a concept meant for disability mainstreaming or an exclusive of special needs education.

Dr. Mungai Njoroge, CEMASTE

Customer Service Training

Workplace Relations



We spend about one-third of our lives at work. Therefore this goes without saying that good work relationships with colleagues will make our jobs more enjoyable. When we are comfortable with co-workers, we feel confident to voice our opinions, embrace change and be more creative and innovative. In return, this increases our levels of productivity in an organisation.

In the spirit of building more productive and robust work relations at CEMASTEVA, more than 70 members of staff attended customer service training at Elysian Hotel in Kiambu County from 26th -28th May. The training aimed at equipping them with skills on growing healthy relationships and positive



Deputy Director Mrs Lydia Muriithi addressing staff during the training

departmental interactions through external and internal communication.. During her opening remarks, Director CEMASTEVA, Mrs Jacinta Akatsa, HSC noted that healthy work relations among staff are essential if CEMASTEVA was to meet its goals and objectives. She also encouraged all the employees to be humble and be problem solvers in their various departments.

The external facilitators encouraged participants to respectfully air their grievances or challenges faced in their duties

to enable efficient and effective workflow. Teamwork and collaboration were emphasized with the staff also encouraged to accept positive criticism.

There was also an emphasis on the need to have courage, confidence and certainty as through such values; one can overcome challenges both in the working and social environments. According to Mind Tools, effective work relationships require trust, respect, self-awareness, inclusion, and open communication. It is essential to note that building good relationships and people skills takes time. This requires one to work on their emotional intelligence, mindful listening, appreciating others, being positive.

At the close of the training, the Deputy Director, Corporate Affairs Mrs Lydia Muriithi, appreciated participants and facilitators for being well engaged and for their active participation, eagerness to learn throughout the training. She was optimistic that staff would practice knowledge and skills gained and looked forward to more significant and better work relationships among colleagues at the Centre.

'Be sincere with each other to avoid uncalled insecurity amongst you at the workplace. Every person has a problem and if you are willing to assist the other person to overcome those problems, then I believe you will have made a positive impact in that person's life', furthermore, telling the truth will not cost you anything, but you will earn trust from other people',

Director, CEMASTEVA

Ndolo Anderson & Willy Kirui, Communications Department

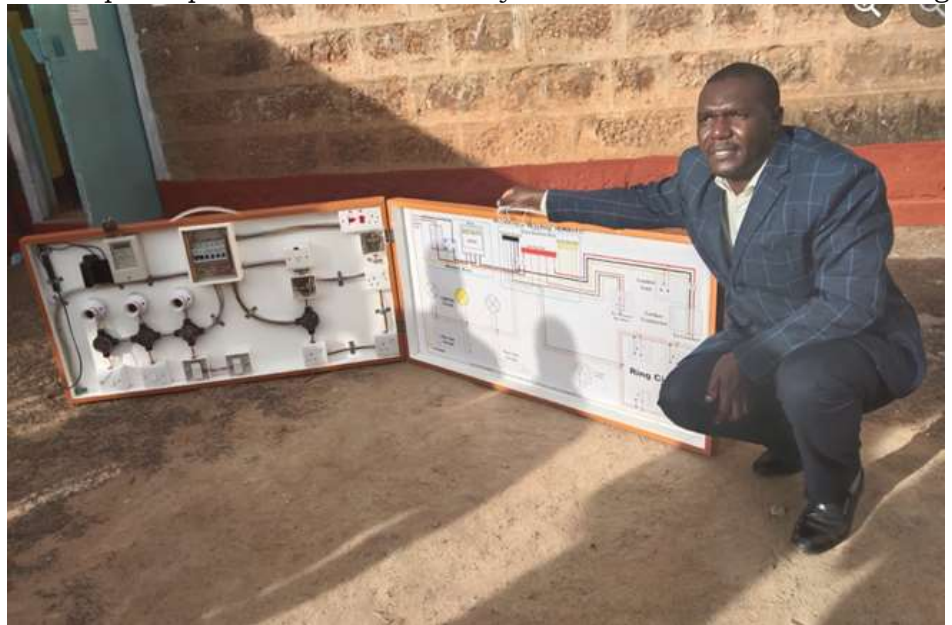
My SMASE Journey

Coming from a very humble background, teachers played a pivotal and mostly non-official role to mould me into who I am today. My work as a teacher is influenced by the role my teachers played during my formative years. My journey as a teacher significantly changed when I participated in SMASSE training in 2004. This first cycle of SMASSE INSET had a theme on *attitude change*. I connected with this theme and learnt that attitude is everything. A teacher's attitude towards a subject affects how they plan and implement lessons, and this attitude could also affect the learner's attitude towards the same subject. Every year that followed, I looked forward to SMASSE INSET that came with inspirational themes. Cycle two was on the theme of hands-on activities with *improvisation* and *innovation* taking centre stage.

This is how my innovation journey started with my classes growing more enjoyable and learner achievement becoming better. At Ruthagati High School, the Physics mean score improved from 1.9 (E) to 4.5(C-) over four years and at Leshau Boys, the mean score improved from 6.5 (C+) to 8.0 (B-) over two years. I did not know that my class innovations meant much until my former students started posting success stories of how my teaching influenced their performance and career paths.

During INSET at Nyandarua High School in 2018 on *ICT Integration in learning*, the CEMASTEFA facilitator, Mr John Odhiambo, asked participants to mention if they used innovation in class. Being

among the teachers who responded in affirmation, I was requested to describe my innovation. I chose to explain the Ripple Tank Innovation. I later shared my work with the then Director CEMASTEFA, Mr Stephen Njoroge HSC, when I was invited to the Centre. This interaction led to my nomination for AFTRA Fellowship Award, which I attended at Maseru, Lesotho. It was sponsored by CEMASTEFA in the conference, my work was celebrated, and I was given a special honour to address the Gala dinner.



Mr Wahome displaying one of his innovations for teaching electricity transmission

This achievement continues to encourage me to always be at my best practice.

I have learnt to work with my students, involve them in the learning process, overcome challenges, and celebrate victories. Learners, when interested, become self-driven, more actively disciplined and easy to teach. One great discovery I have made in this journey, is that I also learn from them I am now more patient than I was before. Lastly, I have come to appreciate that though work and remuneration may not always be fair, a satisfying job will always create joy in ones' life, even during challenges. I am a happy teacher who looks forward to helping many learners become the best in life.

David Wahome, Passenga Secondary, Nyandarua County

CAS Mumina Gallo Bonaya Visit

On 20 May, 2021, the Director Mrs Akatsa had the privilege to host the Chief Administrative Secretary (CAS), State Departments for Early Learning & Basic Education and, University Education and Research, Ministry of Education, Ms Mumina Gallo Bonaya.

During this courtesy visit, Director briefed the CAS on activities CEMASTEA is undertaking and how the Centre continues to navigate the COVID-19 impact on its programmes. Most of the Centre activities,

she was informed, had been shifted online and indeed, during the time of the visit, an ICT integration course was underway. It aimed at giving teacher's knowledge and skills for sourcing and using the most effective online tools and ICT resources to deliver remote lessons. The CAS was informed and witnessed that CEMASTEA had stringent measures to protect staff and visitors from COVID-19. The



CAS Mumina trying out activities in the innovations laboratory

Centre maintains a lean staff with the majority working from home as guided by His Excellency President Uhuru Kenyatta in his last address to the Nation.

The CAS also took time to tour CEMASTEA facilities. In the innovations laboratory, she was amazed by the fun and mind enriching activities, as explained by Mr Akoko Paul, a senior laboratory officer, and how teachers could implement them in STEM lessons. She was also impressed with the Centre's Corporate Social Responsibility of providing mobile laboratories to needy and low resourced schools.



Director CEMASTEA explaining the mobile laboratory to CAS Mumina

Thuo Karanja, Biology

Business Resilience through Effective implementation of ISMS

A team of officers from CEMASTEIA led by the Director Mrs Jacinta Akatsa, HSC attended the 1st Annual Information Security Management Systems (ISMS) Conference held from 22nd to 25th June 2021 at Sarova White Sands and Spa Hotel in Mombasa. The conference's theme was *ISMS: A focus on Confidentiality, Integrity and Availability of Information (CIA) in Organizations*. The key objective was: *Enhancing business resilience through effective implementation of ISO/IEC 27001:2013 Information Security Management Systems (ISMS) in Organizations*. In collaboration with the National Cyber Command Centre, the Kenya Bureau of Standards (KEBS) organized the conference. Conference participants included senior officers charged with implementing and monitoring quality management systems and ISMS in their organizations.

These included management representatives, heads of key departments, Information Security Officers, Quality assurance and compliance officers and Lead auditors. Institutions represented included Communications Authority of Kenya (CA), Kenya Revenue Authority (KRA), Kenya Rural Roads Authority (KeRRA), National Social Security Fund (NSSF), the University of Embu and Mt Kenya University; Moi Teaching and Referral Hospital (MTRH). Others were CEMASTEIA, Meru Polytechnic and Eldoret Institute of Science and Technology. Commissions were represented by the Office of the Data Protection Commission (ODPC). Safaricom represented the private sector. The organizations were reported to be at different stages of implementing the *ISO/IEC 27001:2013*.

The conference presentations adopted an interactive approach with case studies, plenary and panel discussions, Question & Answers (Q & A) sessions and experience sharing. This

way, participants could exchange notes and ideas on strategies and techniques about ISMS, from initiation, monitoring & evaluation and auditing. Some presentations included; *Business resilience through ISMS (NC3)*; *Integrating ISMS with QMS A Case study of NSSF(NSSF)*; *Understanding the ISMS Legal Framework in Kenya(CA)*, *Kenya National Cyber Security Threats and Challenges(NC3)*, *Human Assets: An Opportunity or Threat to CIA(Safaricom)*, *ISMS and Remote Working(University of Embu)*.

Data and Information in Kenya is a strategic resource, and as such, we are all responsible for protecting it. Further, cyber was cited as the 5th domain of warfare after space, air, land and sea; therefore, cyber security should be driven through policy and strategy by the top



Director, CEMASTEIA Jacinta Akatsa making remarks during the closing ceremony. Besides is Colonel Evans Ombati Director of NC3 who was Chief Guest

management. Conference participants were enlightened on the concepts and context of ISMS including its three key pillars.

Data and information *Confidentiality* referring to the protection of information from disclosure to unauthorised entities. The *Integrity* of data and information demands the protection of information entities, systems and services from unauthorised modification or destruction. Data and information *Availability* refer to service-

related ability to recover quickly from system failure through the use of backup systems that ensure continuity of service after minimal downtime, system failure or breach of security. Cyber security challenges include; (a) unethical conduct emanating from insider threats, and therefore organizations should ensure accountability of system users, (b) loss of control over system data, requiring the need to localize data hosting, (c) 3rd party suppliers and vendors bring to fore the need for End-user agreements with suppliers addressing the pillars of information security. These threats and challenges could be reduced through the implementation of ISMS

In a presentation on ‘*Emerging Technologies*’ by N3C, participants got to know more about concepts and practices of ubiquitous cloud computing (UC), Artificial intelligence (AI), 5G Technologies, Internet of Things (IoT) and Block Chain. In each of the cases, presenters informed participants of the merits and the information and data security threats of adopting these new technologies. The panel discussions by KeRRA, KRA and KEBS focused on *success stories* in the implementation of ISMS.



**National Cyber
Command Centre**

The CEMASTEAM team participated in panel discussions through sharing experiences in data management and security regarding remote teaching. The conference could not have been at a better time for CEMASTEAM, and the focus on resilience was apt as the Centre engages in post-COVID-19 Recovery strategies. Furthermore, the shift to web-based Teacher Professional Development (TPD) practices at CEMASTEAM means more data and information are processed, delivered, and stored in e-forms either in the clouds or offline storage devices. Adopting guidelines from the ISO/IEC 27001:2013 Information Security Management Systems (ISMS) at CEMASTEAM is even more urgent.

KEBS Managing Director & Council Secretary Lt. Col. (Rtd) Bernard N. Njiraini was the Chief Guest during the opening ceremony. Director of



**Kenya Bureau of
Standards**

Standards for Quality life

National Cyber Command Centre Colonel Evans Ombati was the Chief Guest during the closing ceremony. Both guests noted data and information as key to driving institutions in the 21st century. Therefore, there is the need for institutions to embrace quality management tools such as ISMS_ISO/IEC 27001:2013 that gives the well-tested controls for maintaining data and information *confidentiality, integrity* and *availability* while also safeguarding it from threats posed by cyberspace. During the closing ceremony, Director CEMASTEAM commended KEBS and NC3 for organizing such a successful conference. She urged participants to continue networking and share more strategies on the culture for data and information security management.

Thuo Karanja & Masai Gladys, CEMASTEAM



Collaboration: KMTC Practicals

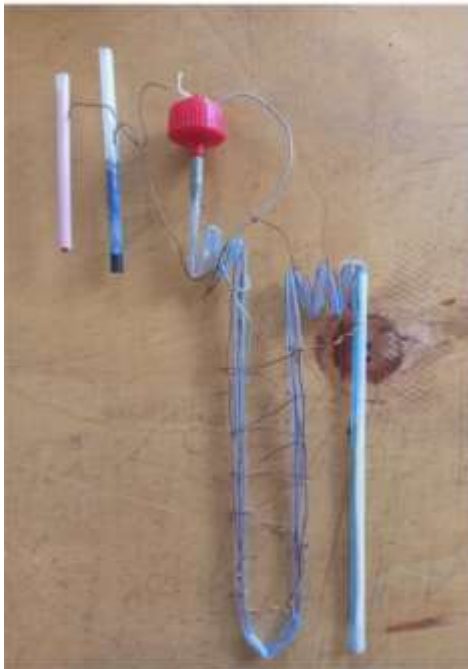
In the spirit of collaboration and support for STEM education, CEMASTEА has partnered with the Kenya Medical Training College (KMTC) Karen campus to provide a conducive environment for microbiological practical to students. CEMASTEА has modern laboratories with high-quality equipment, apparatus (autoclave, centrifuge, water baths, microscope fixed with a camera and hot air ovens and qualified personnel. Therefore, the Centre offers an enabling environment for the students to learn and carry out practical activities such as sterilisation, microscopy, staining, culture media preparation, and other microbiological techniques. During the visits, they get ample time to conduct practicals and appreciate the role of praxis in learning. The students benefitting from this collaboration are those taking the Course Nutrition and Dietetics the Unit Food microbiology. Since the beginning of this collaboration, students have shown immense interest in pursuing their courses.

Paul A. Twenyo, Biology Dept. CEMASTEА



Paul Akoko guiding KMTC students on how to conduct centrifuging

Hands-on activities: Crafting the Nephron

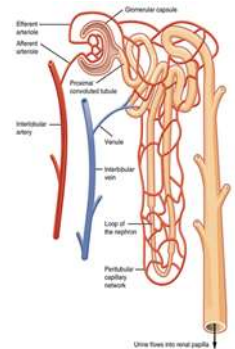


Teaching the structure and the functions of the kidney; particularly urine formation at nephron is fascinating. Lesson activities involve dissecting the kidney of a goat to observe the general structure.

I found this picture on a County trainer's wall and thought it an ingenious way a teacher can further get learners to engage in some hands on activity in designing nephron with cheap and locally available materials. The engagement can have learners deepen their understanding of the expected learning concepts.

It is fulfilling to note that teachers are still practising the concept of a ASEI-PDSI which up to now still remains a powerful pedagogical tool for practising learner centred lesson.

Kizito Makoba, Dean Biology Dept., CEMASTEА.



UN Road Safety Week

The effects of poor driving habits and other poor road-use practices in Kenya cannot be gainsaid. Every year, the National Transport and Safety Authority (NTSA) and the Traffic Police Department reports many fatalities caused by road accidents. In addition, many families in Kenya lose loved ones or shoulder the burden of caring for those who get infirmed through road accidents. The United Nations General Assembly, in its Resolution A/RES/74/299) declared the new Decade of Action for Road Safety



Chief Administrative Secretary, State Departments for Early Learning & Basic Education and University Education and Research, Ministry of Education Ms Mumina Gallo Bonaya, signing the pledge

support the need to reduce speeds while driving in streets where people mix daily with vehicles. The campaign went on well, with a majority approving that it was a worthy cause if well implemented. Some of the presentations used during the CEMASTEIA ICT training in the week bore the messages on Road Safety. CEMASTEIA was privileged to have the Chief Administrative Secretary, State Departments for Early Learning & Basic Education and University Education and Research, MoE Ms Mumina Gallo Bonaya, signing the pledge. www.unroadsafetyweek.org

2021-2030. As part of the declarations, the UN held the 6th Global Road Safety Week on 17th -23rd May 2021. The 2020 Stockholm Declaration, adopted by governments worldwide, is central to the campaign calling for, in line with available evidence, a maximum road travel speed of 30 km/h where vulnerable road users and vehicles mix in a systematic and planned manner. The focus of this campaign is to promote low speeds, mainly to protect the weak, prevent road traffic injury, and help encourage walking and cycling.

CEMASTEIA Road Safety Committee, following NTSA guidelines, supported the campaign by sensitising staff and visitors. The team, led by the Committee Chair, Mr Isaac Gathambiri, developed posters with the necessary messaging on Road Safety. Staff were encouraged to sign the posters pledging to



In solidarity: CEMASTEIA staff sign the poster in support of UN Road Safety Campaign, 2021

Thuo Karanja, Road Safety Committee, CEMASTEIA



COVID-19 Containment Messages



‘Two million COVID-19 deaths: Our world can only get ahead of this virus one way – **together**. As science continues to blaze new trails of hope, let’s also remember the simple and proven steps we can all take to keep each other safe: wearing masks, physically distancing and avoiding crowds’



UN SECRETARY-GENERAL ANTÓNIO GUTERRES STATEMENT ON THE TWO MILLIONTH DEATH FROM THE COVID-19 PANDEMIC

‘But in these unprecedented times, not only in Kenya but globally as well, Kenyans have a way of intuitively pulling together, coming up with innovations and building **resilience**. I have submitted in the past that a crisis, like the COVID pandemic, represents both threats and opportunity. Those who get paralyzed by the hurdles amount to nothing. But those who see opportunity in the face of challenges produce innovations. There is no doubt, without labour, there is no prosperity. Labour is the game-changer of all progress; we must, therefore, celebrate our workers as creators and makers of things, during COVID and in good times’.



A PARAPHRASE FROM THE ADDRESS BY HE HON. UHURU KENYATTA, CGH, DURING LABOUR DAY CELEBRATIONS AT STATE HOUSE, NAIROBI, 1ST MAY, 2021.

Thuo Karanja, CEMASTEAM

Coffee Break


$$\begin{aligned} \text{Green Circle} + \text{Green Circle} &= 10 \\ \text{Green Circle} \times \text{Yellow Square} + \text{Yellow Square} &= 12 \\ \text{Green Circle} \times \text{Yellow Square} - \text{Red Triangle} \times \text{Green Circle} &= \text{Green Circle} \\ \text{Red Triangle} &= ? \end{aligned}$$

Source: <https://www.cuemath.com/learn/math-puzzle/>

Wangari took 1 hour 10 minutes to complete her homework. She took 20 minutes to wash her uniform. How much time did she take to complete her homework and wash her uniform altogether? 31.

What could be the problem with the mathematical skills of this learner?



Let our schools be safe
for our girls and boys.



Picture Speak: Q4 Events



Celebrating staff birthdays during quarter four



Celebrating Mr David Njoroge long service to CEMASTEA



Pupil of Kithimani HGM Primary School posing for a photo upon receiving a science kit showing in the background



CEMASTEA team attending the KEBS-ISMS Conference at Sarova Whitesands, Mombasa



Chemistry department saying goodbye to Mrs Loise Masese upon her retirement



eKitabu gifting a certificate and a gift hamper to the Director



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Click on this link to give feedback: <https://forms.gle/RkXNWXQ3ehEsqhr48>



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