



# CENIT@EA

Center of Excellence for ICT in East Africa

Bernd Multhaupt / GIZ and Godfrey Uromcamu / Imprint (U) Ltd / Kampala / Uganda

<https://cenit-ea.org>

## CENTRE OF EXCELLENCE FOR ICT IN EAST AFRICA



ICT is understood as a **driver of socio-economic development** in EA region:

- Both the EAC's Vision 2050
- Development strategies of EAC Partner States The availability of qualified experts is assessed crucial to the cross-sectoral significance of ICT



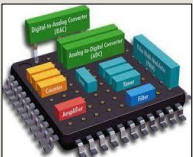
Digital change in Africa is high on Germany's cooperation agenda

- EAC Germany initiative to establish East African Centre of Excellence for ICT (CENIT@EA) in April 2017
- providing a **very hands-on and demand driven master degree course** in mobile and embedded systems.



Multilateral Cooperation between

- the **Nelson Mandela African Institution of Science and Technology (NM-AIST)** in Arusha, Tanzania together with the University of Dar Es Salaam (TZ) and the University of Technology and Arts of Byu (RWA)
- the **Carl von Ossietzky University of Oldenburg (GER)** together with the German Aerospace Center (GER), the Hochschule für Technik und Wirtschaft (GER), and the Hochschule Mannheim (GER).



Target Group

- **Graduates** with a first academic degree in Science, Technology, Engineering and Mathematics (STEM) as well as **professionals** working in academia, industry, or the public sector.



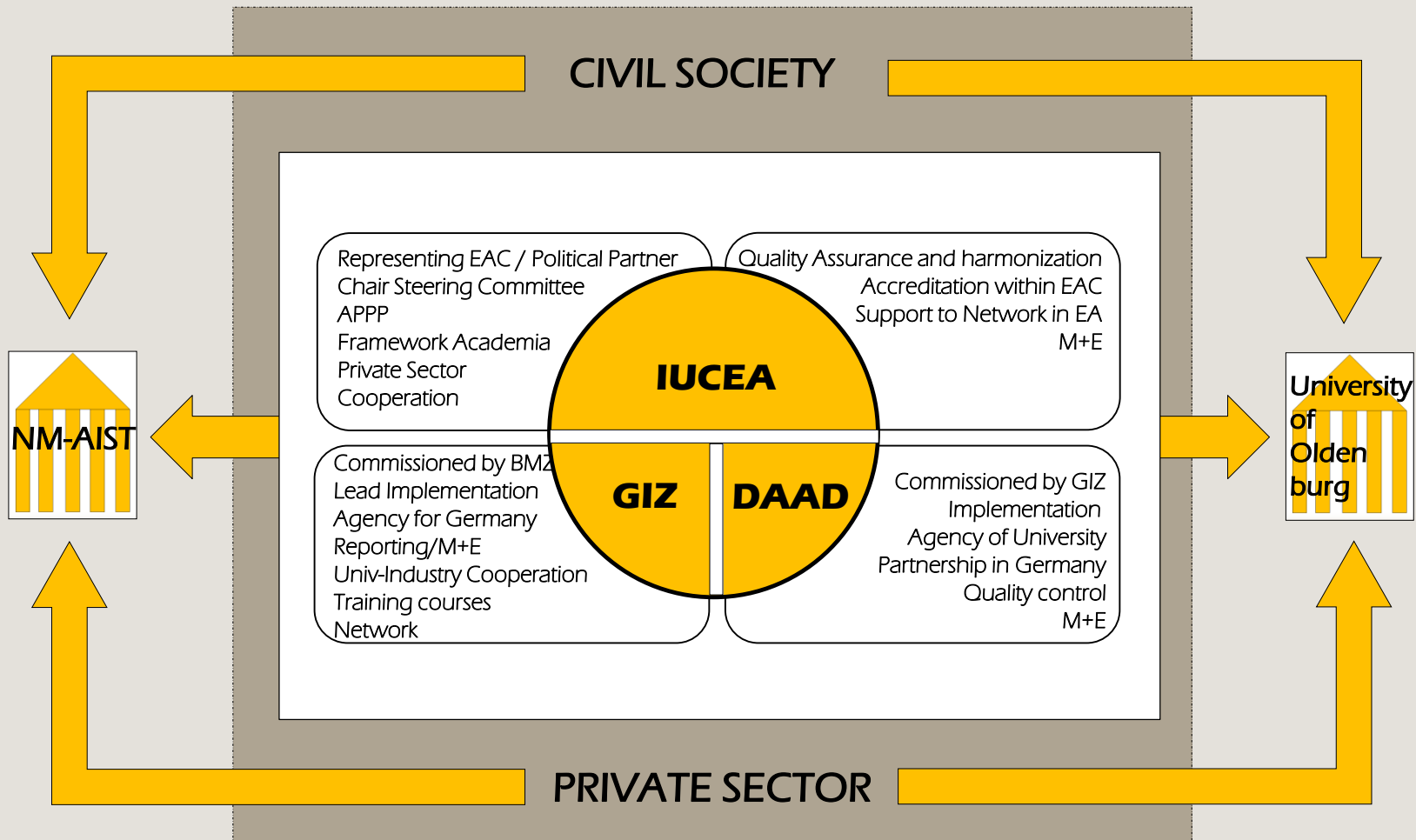
Major Topics

- **Mobile Computing** (i.e., Mobile Application Development, Mobile Commerce, Mobile Communication Technology), **Embedded Systems** (i.e., Systems Engineering, Microcontrollers, Sensors/Actuators, Assembler Programming), **Soft Skills** (i.e. Project Management, Presentation, Moderation, Conflict Management, Entrepreneurship, Design Thinking, etc.), and **Basic Skills** (i.e., Electrical Engineering, Information Systems Engineering, Operating Systems, Business)





# MULTI-STAKEHOLDER PARTNERSHIP

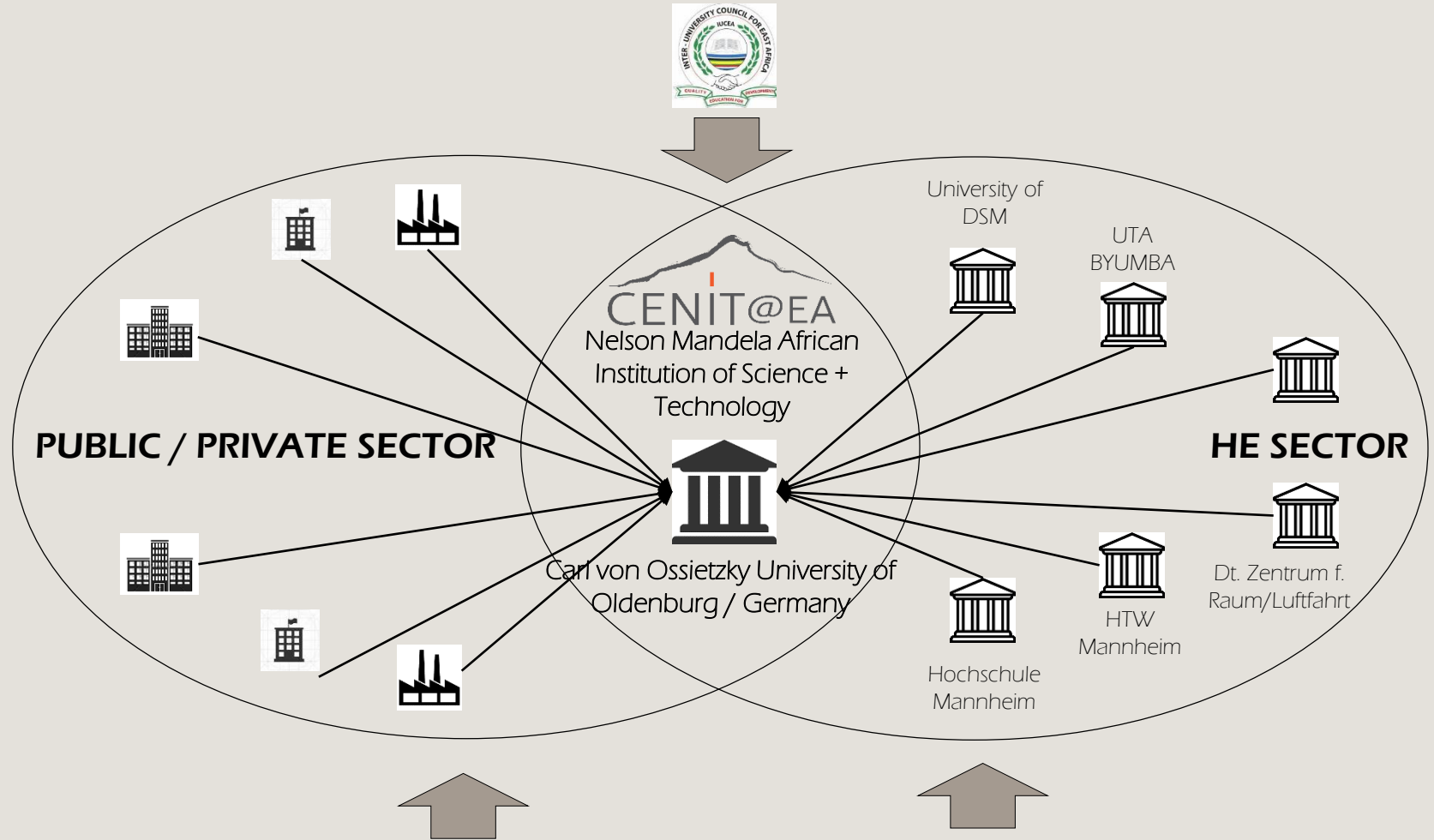




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# CENIT@EA CONCEPT



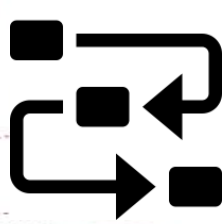


## **NEEDS ASSESSMENT** FOR POST-GRADUATE EDUCATION AND TRAINING



IN EMBEDDED AND MOBILE SYSTEMS IN EAST AFRICA

Presented by: Godfrey Uromcamu / Imprint (U) Ltd / Kampala / Uganda



## **METHODOLOGY** & TARGET RESPONDENTS

### APPROACH:

- Semi-Structured Questionnaire;
- Desk Research/Documents Reviews
- Purposive and Snow-bowl sampling

### MODES OF SOLICITING RESPONSE:

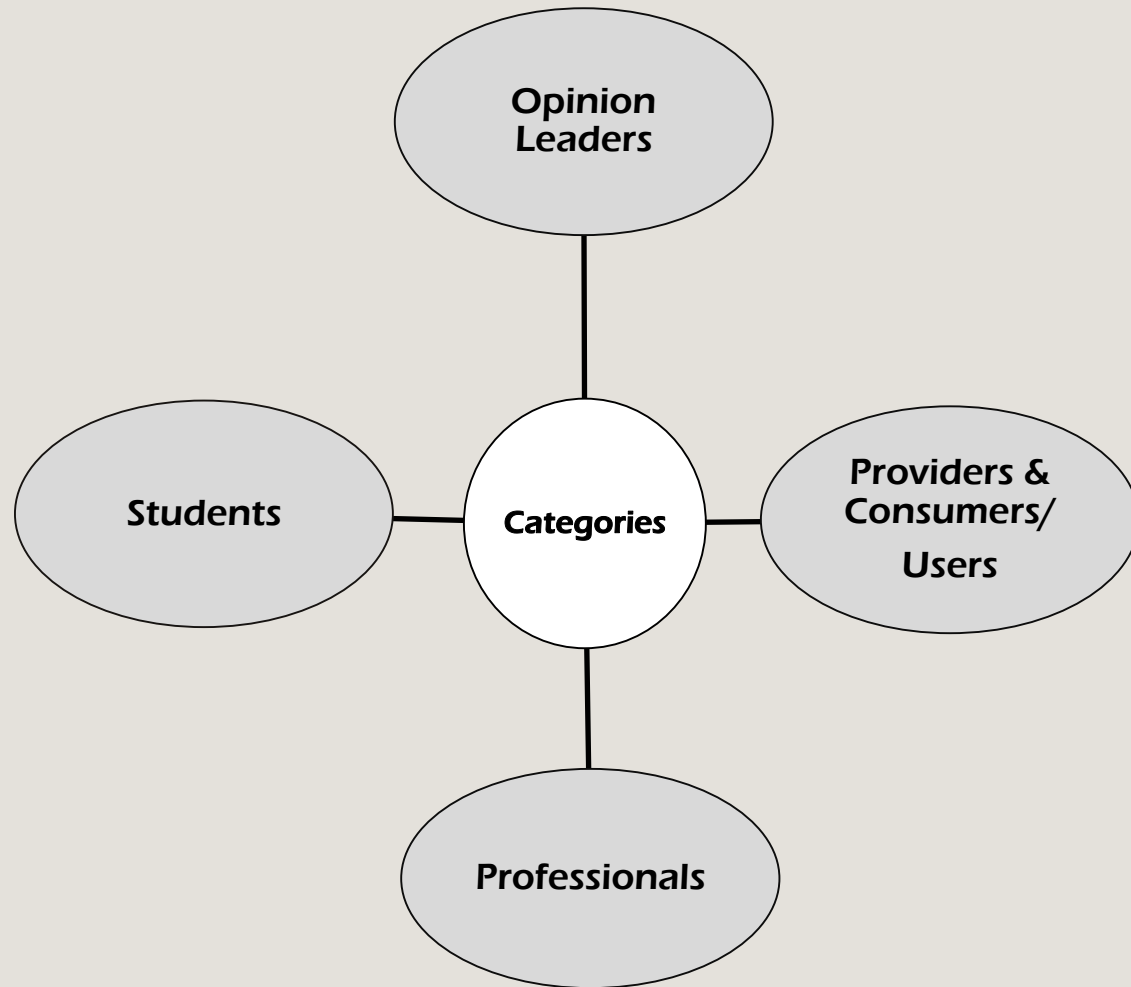
- Online tool (<https://ona.io>)
- Face-to-Face Interviews
- Telephone/Skype Interviews

### DATA ANALYSIS

- Data Exported into Ms. Excel to facilitate further analysis

### DURATION:

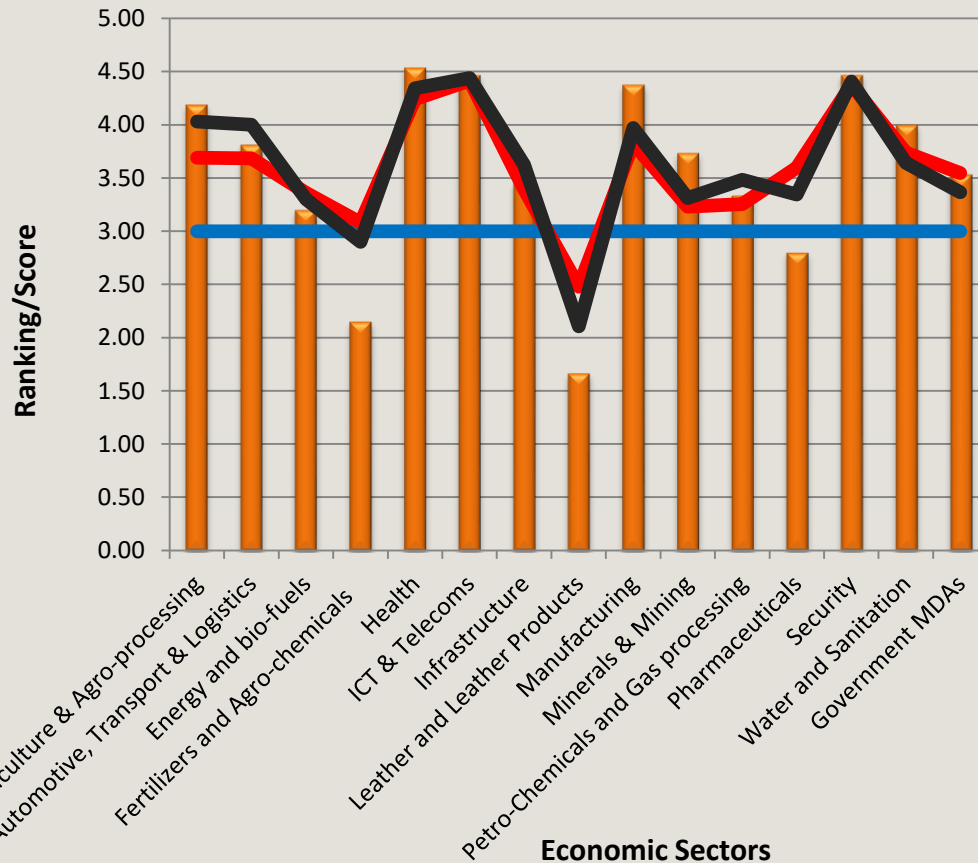
- 2 Months(from 19 Sept to 15 Nov 2017)





## SECTOR RANKING KEY PLAYERS

Average Ranking (0-5) in Level of Demand for EMS  
(0=None; 1=Least; 2=Less; 3=High; 4=higher and 5=highest)



### KEY PLAYERS:

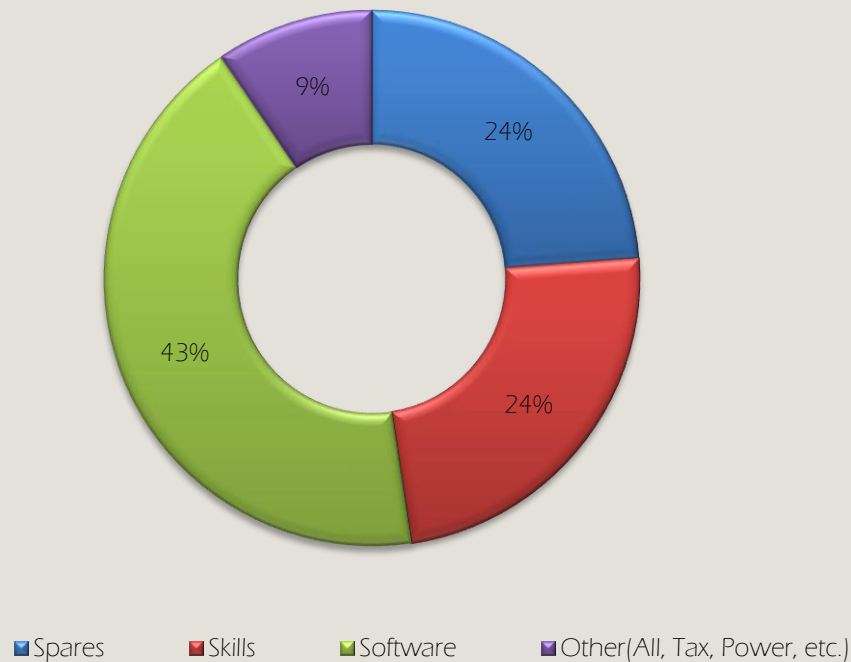
- Hospitals/Health
- Security
- Ict& Telecoms
- Manufacturing/Factories
- Agriculture, Oil & Gas
- Water & Sanitation
- Infrastructure
- Education

Social Services Sectors take  
the Lead



## INDUSTRY CHALLENGES NATURE OF PROBLEMS

Nature of EMS Problems Experienced by Professionals in the EAC Region

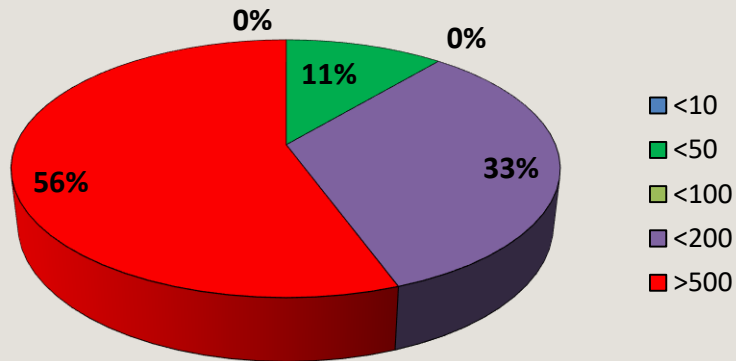


- Problems mostly software related
- Mostly use experts from outside the region – expensive and not sustainable: hence need for skills in EMS

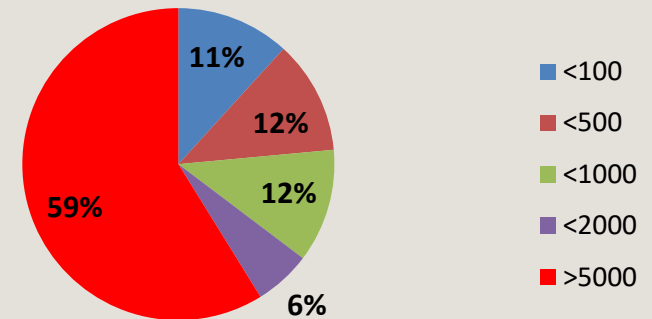


## CURRENT & PROJECTED DEMAND FOR EMS & EMS SKILLS

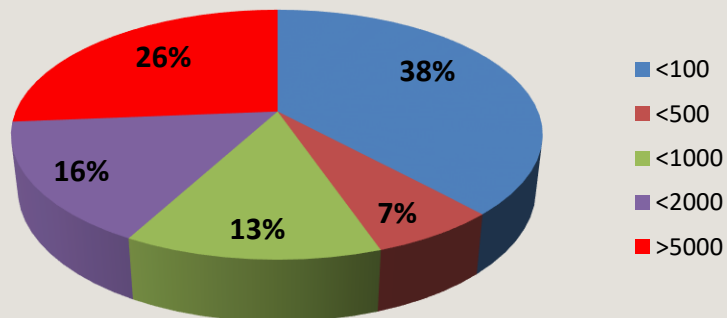
%age of Opinion Leaders' estimates of the Number of Industries that will be Using EMS in the Region in the future



Estimates by Respondents on Numbers of Experts Needed in the EMS Sector within the Next 5 Years - Opinion Leaders



Estimated Number of EMS Professionals needed by Providers/Users of EMS the next 10yrs

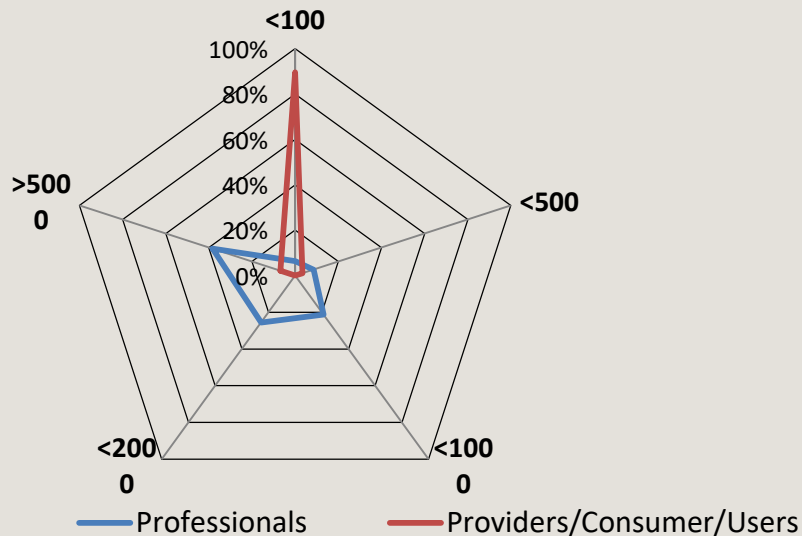


*“There is a limited number of EMS professionals currently in the region”*

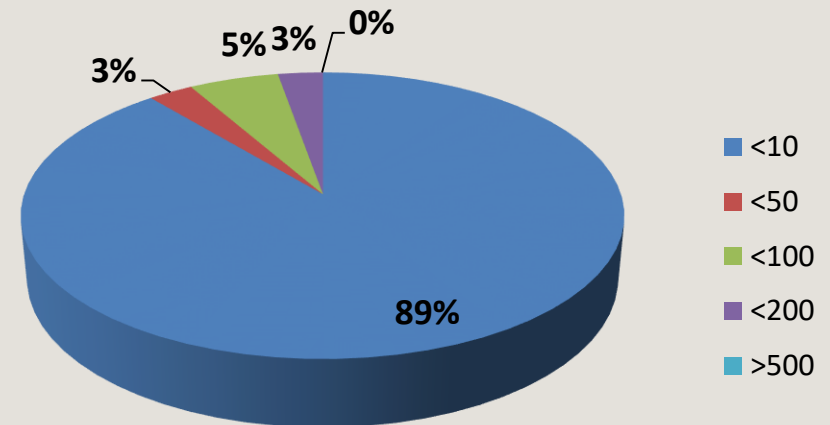


## EMPLOYABILITY OF EMS PROFESSIONALS

Projected Organizational demand for EMS Professionals in the next 10yrs



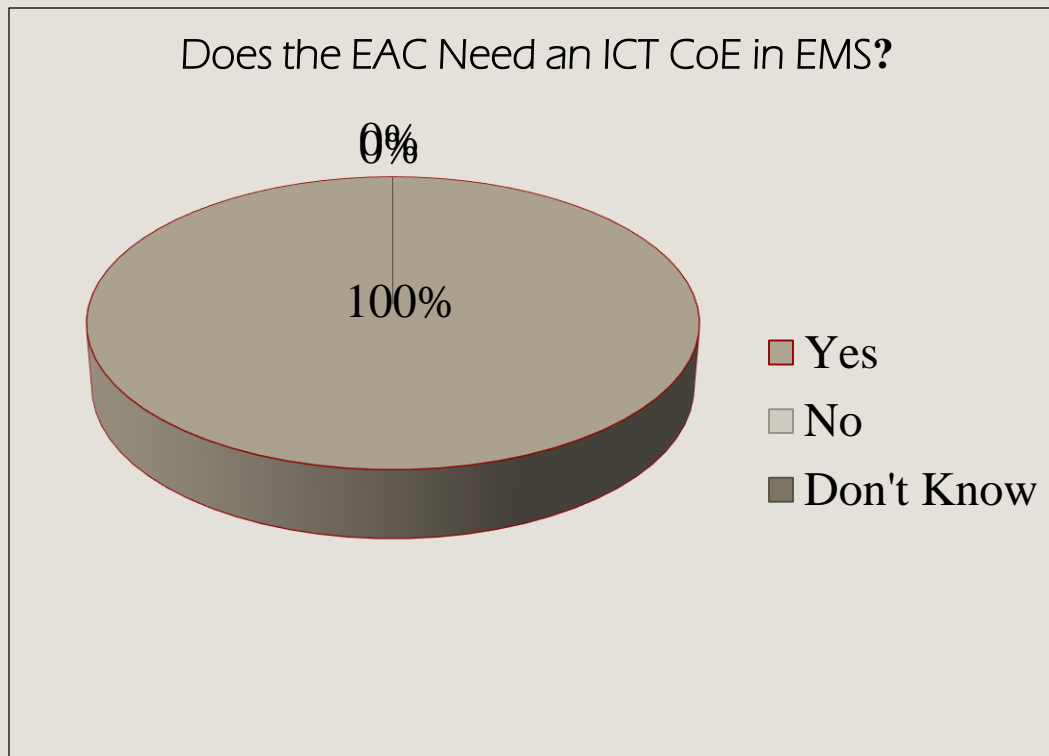
Average Number of EMS Specialists Employed by Providers/Users of EMS



No question about demand for EMS professionals – there is prospects for newly trained professionals to be employed.



## **NEED** FOR ICT COE AND EMS GRADUATE PROGRAM

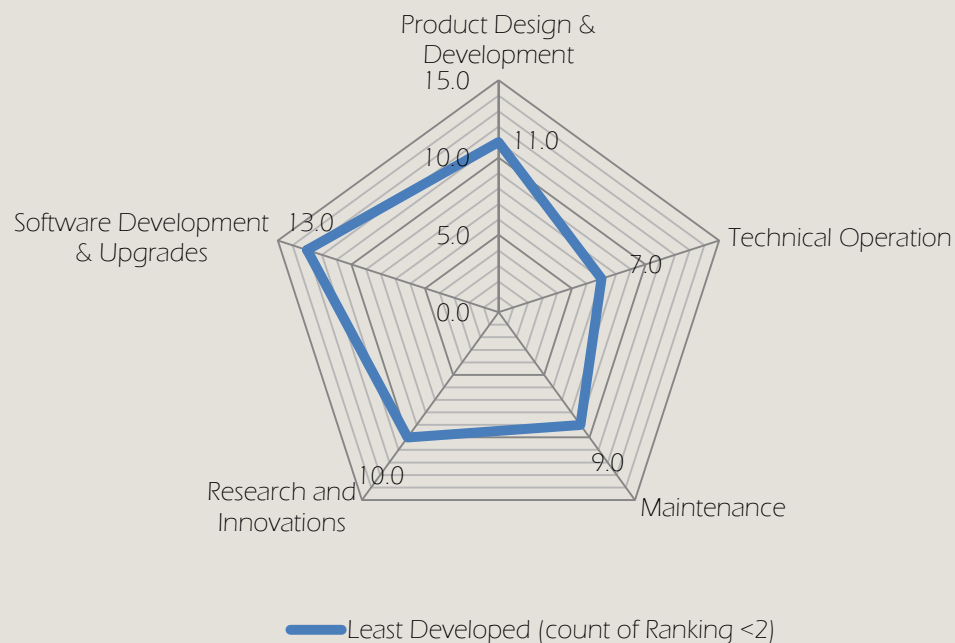


Quote by an Opinion Leader:  
***"This is self explanatory"***



## **GAP ASSESSMENT** EMS UNDERDEVELOPED SKILLS

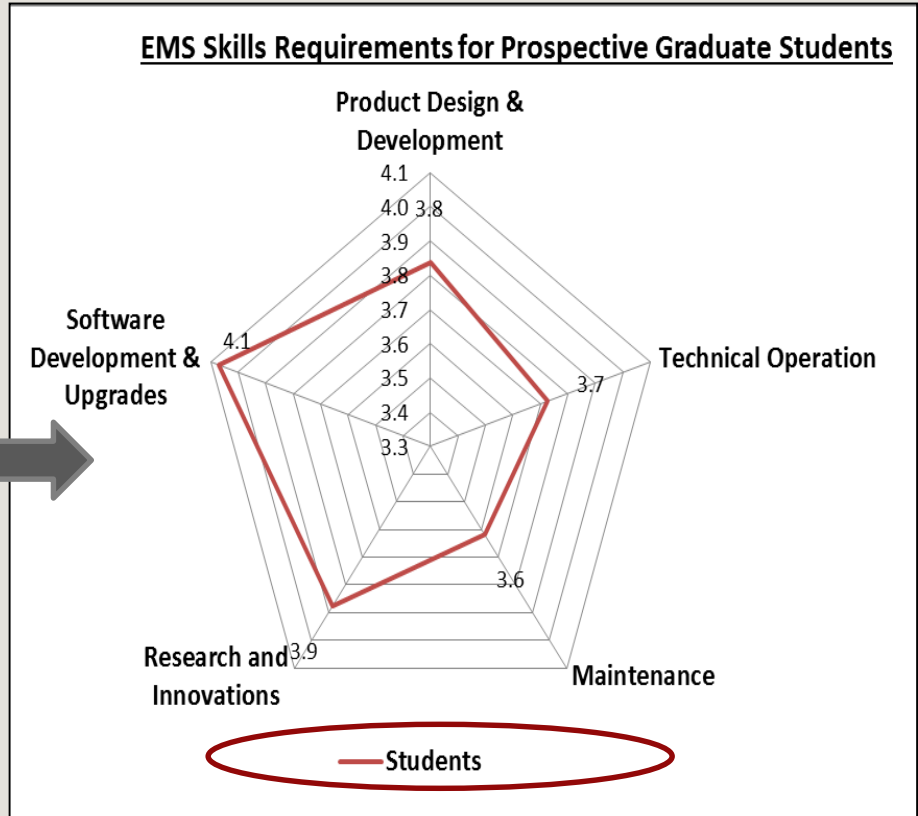
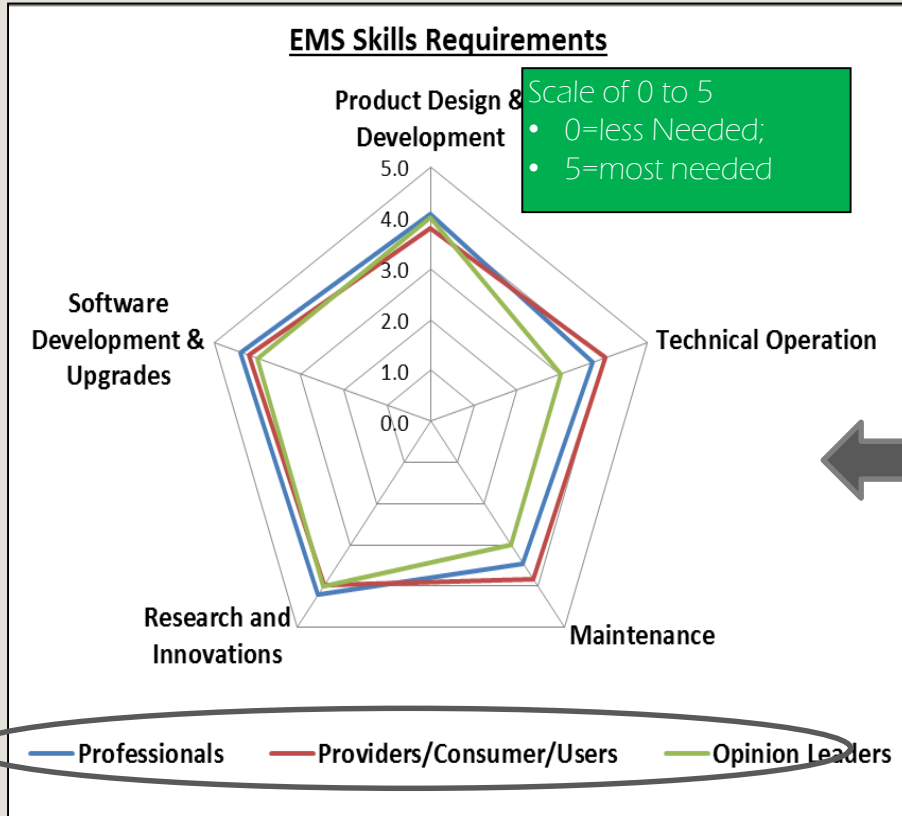
### Least Developed EMS Skills for Service Providers/Users - Ranked <2



- **Software Development & Upgrade Skills,**
- **Product Design & Development**
- **Research & Innovation skills**



# NEEDS OF INDUSTRY VS. PROSPECTIVE STUDENTS' REQUIREMENTS



More preference for software development & upgrades, Technical Operation for Providers and Professionals

More preference for Software development & Upgrades; Research & Innovations for students



## **SHORT-TERM COURSES** SPECIFIC CONTENTS

### **EXAMPLES OF TRAINING THEMES**

- Security of EMS
- Programming Internet of Things (IoT) Applications
- Industrial control systems
- Robotics
- Product design and sensor Manufacturing
- Telemetry Systems and Smart Instrumentation Technologies.
- Machine Learning/Artificial Intelligence
- Automation of equipment to enable telecommuting, Automatic storage of work
- Embedded Systems Architectures

### **KEY APPLICATION AREAS**

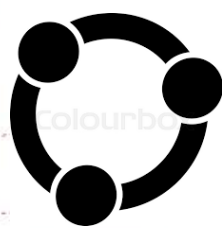
- Transportation & Logistics Tracking Systems
- Health Care Systems
- Security Systems
- Manufacturing/Packaging Operations
- ICT & Telecoms



## **EXPECTED** PROGRAM OUTCOMES

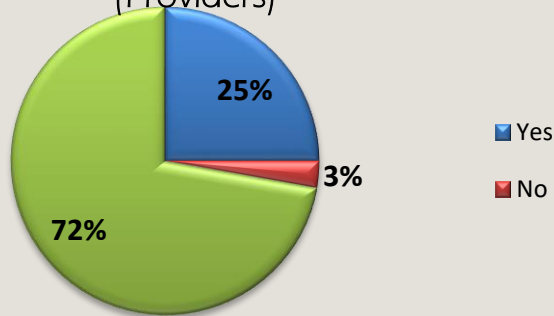
### **Students should be able to:**

1. Build systems that solve the everyday needs of Africa in consideration of the PPP. Products should be affordable to the population
2. Support the existing systems, be able to upgrade them or develop better options
3. Demonstrate entrepreneurial/business skills through Business Incubator Programs and participate in industrial development
4. Demonstrate sufficient knowledge on open-hardware and Internet of Things (IoT)
5. Acquire knowledge and understanding of primary embedded systems architectures, the merits and also challenges

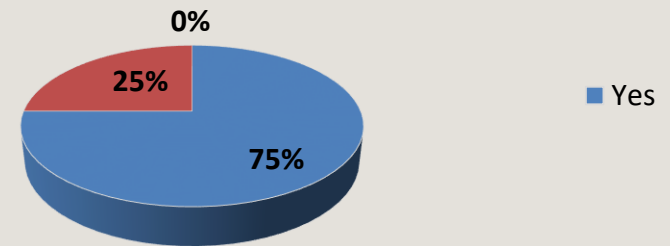


## COE – INDUSTRY COLLABORATION

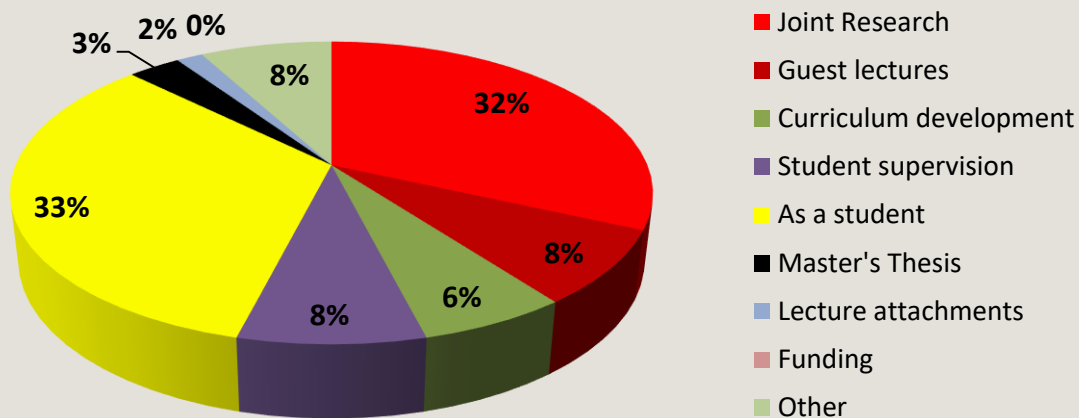
Willingness to Collaborate with ICT CoE -  
(Providers)



Would your organization provide support  
for the Graduate Programme in EMS?  
(Providers)



How would you like to collaborate?

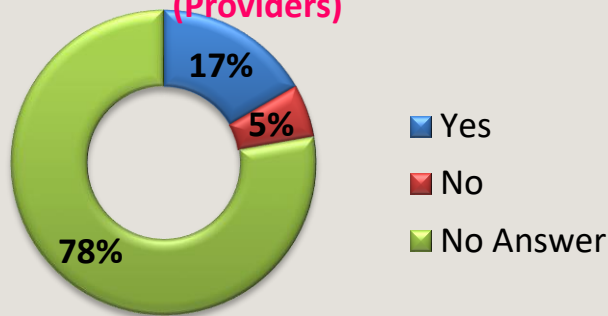




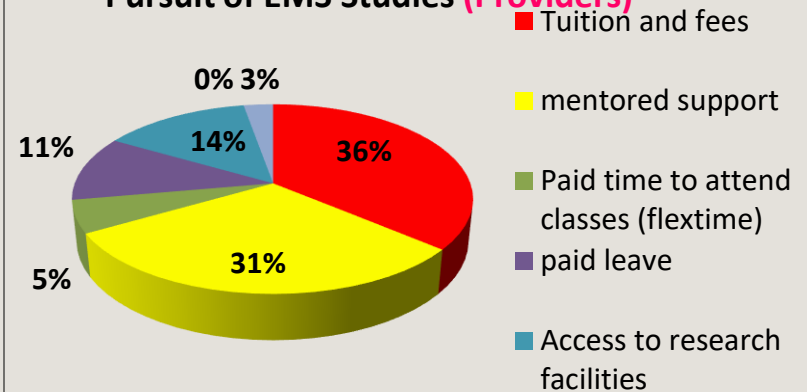
## PROVISION OF SUPPORT AND FUNDING

Are you willing to Support **Employees** to pursue graduate programme in EMS?

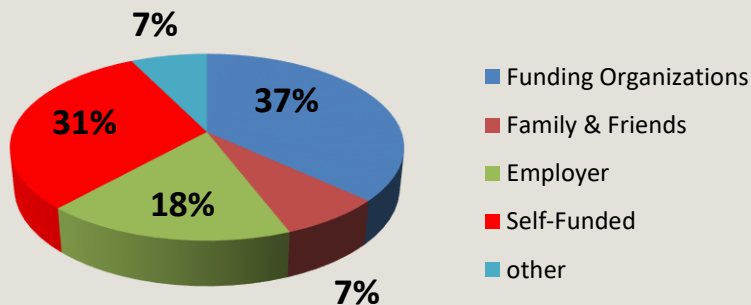
(Providers)



Type of Support to own **Employees** in Pursuit of EMS Studies (Providers)

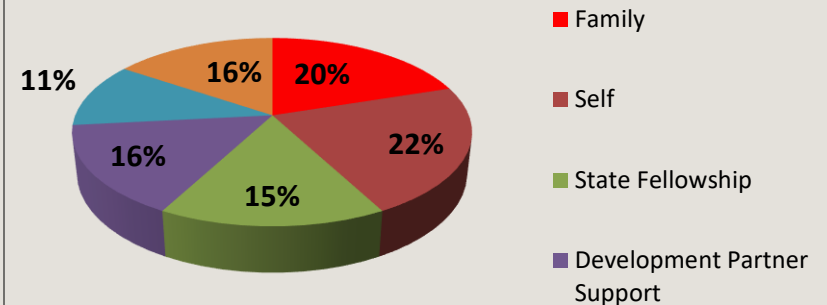


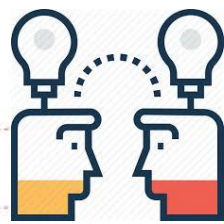
Funding Options/Support for EMS Training (Professionals/Providers)



How would you fund your studies if the Graduate Programme became available?

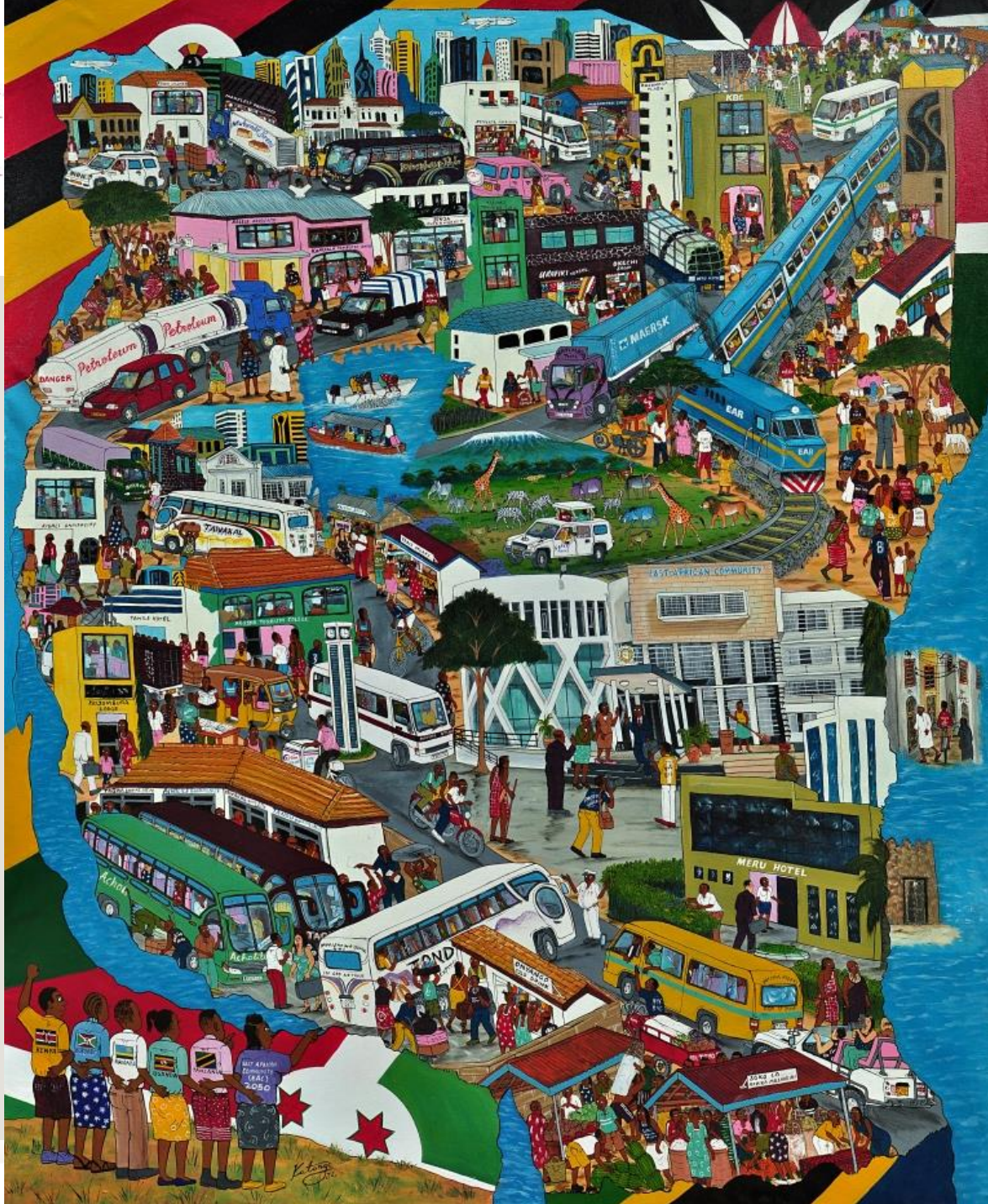
(Students)





## **LESSONS LEARNT** CONCLUSIONS

- ICT CoE and master program in EMS received positively.
- Need for short term specialized/professional courses focusing on enhancing productivity of EMS professionals.
- There are few forums for knowledge exchange and networking the region on EMS.
- Key areas of collaboration identified include between academia and industry include; curriculum development, joint research, student internship, and technology transfer initiatives.
- Industry (providers) may provide partial support to their employees to undertake graduate studies.
- Program should develop Entrepreneurial and Business skills – Business Incubator Program



# ASANTENI SANA