

Topic: A shared value approach to improving health systems: a case of strategic partnerships between faith based and academic institutions to support health system sustainability through a biomedical engineering programme.

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Who are we?



The UMC Zimbabwe Health Board is a faith based initiative that oversees 3 Mission Hospitals & 12 rural clinics manned by 354 Health workers that service a population of close to 310000 locals.

Mutambara Mission Hospital	Nyadire Mission Hospital	Old Mutare Mission Hospital
3 Doctors @ facility	3 Doctors @ facility	3 Doctors @ facility
Services a community of 12391 people	Services a community of 8529 people	Services a community of 6125 people

The Board works with the Government's Ministry of Health (MoH) which registers, manages & maintains all the biomedical engineering equipment by policy. Biomedical Engineers that attend to all equipment are sourced by the MoH from the Biomedical Department at the University of Zimbabwe, the only credible source of Biomedical engineers in the country.

Most of the equipment in the facilities is donated which presents gaps in how the equipment is used & maintained.

Our Current work: Health Systems Strengthening



Top left: Newly constructed operating theatre at Nyadire Mission Hospital.

Top Right: Newly constructed OPD at Old Mutare Mission Hospital.

Centre: Expansion of laboratory at Mutambara Mission Hospital.



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Extent of Biomedical Engineering Equipment

Mutambara Mission Hospital	Nyadire Mission Hospital	Old Mutare Mission Hospital
<ul style="list-style-type: none"> • Maternity: ✓ Incubators ✓ Doppler ✓ Ultrasound ✓ Resuscitate • Dental: ✓ Dental Chair ✓ Dental Autoclave ✓ Dental x-ray • Laboratory ✓ GeneXpert ✓ FBC machine ✓ Haematology analyser ✓ CD4 count ✓ Chemistry analyser ✓ Speed centrifuge ✓ Lab fridges • CSSD ✓ Autoclave 	<ul style="list-style-type: none"> • Theatre Theatre lights Multi Parameter machine Resuscitate Anaesthetic machine Defibrillator ECG Machine Suction machine • Eye Unit Indirect ophthalmoscope Lensometer • Imaging X-ray machine Film Processor • FCH Ultrasound Point of care : HIV testing 	<ul style="list-style-type: none"> • X-ray: Old and new X-ray machines • Laboratory: Chemistry analyzer Full Blood Count machine CD4 count machine Incubator Bio-base digital scale Microscope Water bath Blood bank machine
	<ul style="list-style-type: none"> • Maternity: Ultrasound scan Incubators Heaters Fridges Weight scales Resuscitates Suction machines Oxygen concentrator • Dental: Dental Chairs Autoclave • Theatre: Theatre lights Theatre Tables Defibrillator Patient Monitor Autoclave Anaesthetic machine Suction machine 	<ul style="list-style-type: none"> • Maternity Theatre Anaesthetic machine Autoclave Suction machine Incubators Vital signs monitor • Dental Dental chair Dental autoclave Dental X-ray • Laboratory Biosafety cabinet Barcode printers and readers Thermofisher Thermomixer GeneXpert Hematology Chemistry analysers PCB machine
		<ul style="list-style-type: none"> • FCH/ART Ultrasound scan

Biomedical-Equipment related problems or challenges?

Sourcing , Compatibility & Facility-Equipment Pairing

Operational

Technical Support & Downtime



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Partnering The Health Board & The Nerds

Support the health systems strengthening and sustainability efforts, while the students receive hands on experience.

The support for students comes at a minimal cost to the health facility that provides a modest stipend and housing for students during their multiple short attachments annually.

Along with maintenance, the students provide ongoing audits and training to health facility staff on use of equipment and consider innovative approaches to repair and repurpose aging and broken-down equipment.

Implement a strong kaizen medical equipment management systems with the goal of making our hospitals cutting-edge in a specific amount of time.



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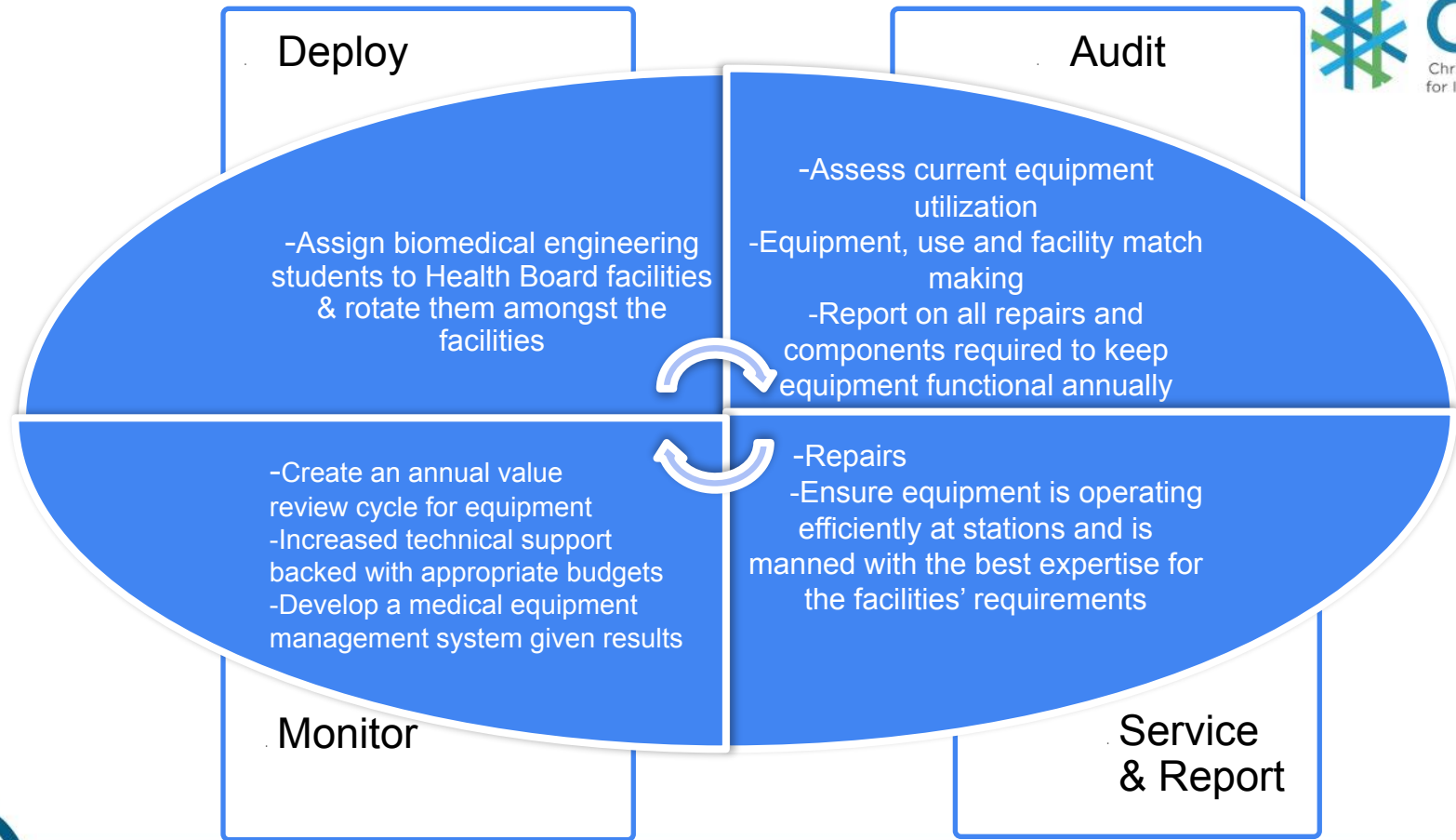
Biomedical Engineering Apprenticeship should cover but not limited to:

- Pre-purchase assessments
- Ongoing equipment audit - value & ongoing fit-for-purpose analysis
- End-user training of health facility staff
- Maintenance of equipment
- Development of innovative approaches to repair and repurpose of aging and broken-down equipment.
- Recommendations of new or alternative equipment that improves efficiency or quality of service

Pictured Right: Ratidzo Munikwa (21), a 3rd year Biomedical Engineering student undertaking routine maintenance of a Comen AX700 anaesthetic machine at Mutambara Mission Hospital.



Program Execution



Logic model

Inputs - Deploy

MOU between university and health facilities
Biomedical students
Biomedical professors/supervisors
Accommodation for students at facilities
Funding for stipends from hospitals/ other donors
Health facility staff responsible for equipment
Existing and new hospital equipment for maintenance and installation

Activities-Audit

Health facilities sign MOU with University
Student selection process conducted
Orientation of students to health facilities by UMC and professors
Student placement
Assessment conducted and workplan shared with facility & supervisors
Maintenance conducted according to workplan
Local facility staff trained on basic maintenance
Final assessment and report to supervisors

Outputs-Service

6 students trained
Selected students oriented to UMC health system and needs at facilities
Students placed at 3 UMC facilities in cycles
2 biomedical equipment assessments conducted at 3 UMC facilities – one pre-maintenance and one post maintenance
Health facility equipment maintained and revitalized for optimum use
At-least 3 facility staff trained at each facility on maintenance and inventory

Outcomes-Monitor

Biomedical equipment functioning at optimum levels at UMC health facilities
Improved health outcomes due to availability and effective functioning of equipment e.g laboratory, x-ray
Complications and fatalities averted
Reduction in operational costs due to availability of equipment and improved efficiency
Financial risk protection of rural population who don't have to travel far for diagnosis and treatment



Call to Action

A fraction of the prevailing technical challenges within our health systems can be addressed through:

Local solutions and partnerships, to support sustainability and strengthening of service provision in health facilities

Models that can be expanded to other Faith based, private and public facilities in Zimbabwe and regionally to other Faith based network

Funding models for ongoing maintenance and training to be considered when donations are made higher income health facilities

Long term success, in terms of sustainable and ongoing improvement of the operational performance of medical equipment requires specific commitments from indigenous health authorities & learning institutions.