

# Firming-up student pipeline key to bolstering physics output in Sub-Saharan Africa, survey reveals

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Attracting and retaining students at undergraduate and postgraduate level has been identified as a key barrier to improving physics-based research output in sub-Saharan Africa, a new survey undertaken by the Association of Commonwealth Universities (ACU) and the Institute of Physics (IOP) has revealed.

According to the study, these pipeline issues originate at school-level, with factors such as a 'lack of encouragement for students to take up physics' and 'a lack of awareness about career paths and professional opportunities' reported to contribute to the shortage of students pursuing postgraduate study.

It was also found in the study that 91 per cent of the universities surveyed in the region feel they would benefit from greater access to 'large-scale' research facilities.

The survey, which was funded by the UK Department for Business, Energy and Industrial Strategy (BEIS), was undertaken as part of a feasibility study around the introduction of a prospective multi-year programme intended to address existing challenges physics research in SSA faces.

The study comes after preliminary research carried out by the IOP in 2019 found that of over 4,000 relevant projects across SSA, only 5.5% involved physics.

The researchers suggest that a multi-year programme has the potential to improve physics training, research, infrastructure and collaboration in SSA with the overall objective of supporting the physics community to produce world-class research and contribute to developmental priorities.

Carried out between March and June 2020, the research used responses from 50 universities and research facilities, combined with focus groups and interviews with 24 physics experts from across nine countries in sub-Saharan Africa: Ethiopia, Ghana, Kenya, Malawi, Nigeria, Rwanda, South Africa, Tanzania and Uganda.

Seeking to investigate current challenges and pinpoint strategic opportunities for intervention, alongside greater access to large-scale research facilities, the survey also identified Big Data and Artificial Intelligence as a key enabler for greater physics research in SSA.

However, deep-seated challenges around gender inclusivity – with the majority PhD holders and academics research staff in the region being male – also pose major barriers to increasing research output in the region.

Having compiled and analysed the data sourced from respondents' answers, the ACU and IOP have offered a number of recommendations to guide the development of future programmes to support physics research in SSA region

Recommendations include:

Providing funding and support to enhance the physics education pipeline, beginning at school-level through to university in order attract and retain more students in physics;  
Addressing gender-based cultural stereotypes and workplace harassment to reduce barriers for women in physics;  
Improving access to large-scale research facilities and build multilateral Centres of Excellence, particularly in the field of health and medical physics;  
Enhancing opportunities to establish new bilateral and multilateral research collaborations and strengthen existing networks.

The report concludes that a stronger physics base and increased capacity to innovate in the fields of energy, climate and health would make a significant contribution to the sustainable development goals, as well as supporting the development of solutions to key global challenges such as climate change.

Meriel Flint-OKane, Head of Programmes at the ACU, says: “Physics has the potential to significantly deepen our understanding and experience of the world, from mitigating climate change to developing new medical technologies. It’s clear from this study that investment in sub-Saharan Africa to strengthen the capacity of universities, develop equitable partnerships, and encourage students – particularly girls and women – to pursue physics as a career, could advance vital innovation that would help us achieve the sustainable development goals.”

Rachel Youngman, Deputy Chief Executive of the IOP, said: “To tackle the great global challenges we need to collaborate internationally, and this study shows the potential for African countries to play a major role in driving forward technological innovation. Capacity-strengthening work in a few key areas could create the conditions for physics to thrive in sub-Saharan Africa. This is every bit as relevant for the UK as it is for Africa, because of the huge untapped opportunities for collaboration and partnership.”

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You can access the report here:

<https://www.acu.ac.uk/news/how-investing-in-physics-in-sub-saharan-africa-could-help-achieve-the-sustainable-development->

For more information, or to speak to a spokesperson about the report, contact Jonny Stone at [jonny@bluesky-pr.com](mailto:jonny@bluesky-pr.com) or call 01582 790704.