Do ICT-integrated virtual laboratories and micro-science kits enhance access to open science education?

Issue at-hand

Science, technology, engineering, and mathematics (STEM) education is generally seen as key to development and industrialization goals of a country. In the modern global economy, STEM education is therefore closely linked with a nation’s economic prosperity. In most countries, education policy makers advocate for policies that improve STEM education at every level. Many have indeed elevated STEM education as a national priority as reflected through their state spending priorities, implementation of effective policies, as well as education reforms and practices that improve student performance in STEM subjects. However, in Africa, many countries still lag behind in STEM education. For instance, the status of science education in Kenya, similar to other African countries, is characterized by poor performance of students at national examinations, low motivation to pursue science related careers and low interest in science lessons.

There is a growing concern among education stakeholders about this poor performance of students in science subjects. One of the suggested mitigations has been to focus on integration of information communication technology (ICT) in STEM education. Education experts contend that the use of ICT in open science education endeavours to remove barriers to quality science learning. Michieka, Mochire, Twoli and Indoshi demonstrated this in a study presented at the 2013 1st International Conference of the African Virtual University, which affirmed that ICT-integrated virtual laboratories and micro-science kits had a significant effect on students’ learning and performance in science subjects.

Recommendations
• Introduce micro-science kits in primary and secondary school science teaching to improve achievement among learners.
• Improve the practice of open science education by conducting more studies in the infusion of ICT-integrated virtual laboratories and micro-science kits and sharing of the lessons learnt to reach more people.
• Encourage integration of the use of ICT in STEM education.

Implications

Overall, Michieka et al assert that ICT-integrated virtual laboratories and micro-science kits have the following implications in the teaching of science subjects:
  • Result in higher access to open science education;
  • There is active learning among learners;
  • Result in enriched science learning environment;
  • Lead to improved performance in skills development;
  • Result in improved performance on practical skills;
  • Result in improved overall performance in science subjects;
  • Are viable and sustainable;
  • Have high safety levels for learners;
• Have low environmental impact (trends towards green science education);
• Are easy and quick to use.

Conclusion

The integration of ICT in the teaching of science subjects such as in the use of micro-science kits and virtual laboratory is important as it opens opportunity for more access and improved quality of science education and training.

Reference

Paper presented at the 2013 1st International Conference of the AVU, Nairobi, Kenya, under the session on Science Education & ICTs.

Title: Enhancing Access to Open Science Education by integrating ICT-virtual labs and Microscience Kits in Kenya

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