

X-TechLab training sessions in Benin: towards borderless science education

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African countries, especially Sub-Saharan Africa, suffers from a severe deficit of engineers and scientists and relies heavily on imported expertise for several reasons including poor quality of education, limited research facilities, and lack of practical experience among graduates. According to the UNESCO's second engineering report, Africa continues to have the lowest number of engineering professionals per capita of all regions of the world [1]. Hence, developing inclusive high-tech education and research facilities is an efficient way to bridge this gap. That is the purpose of the X-TechLab.

X-TechLab is a regional training platform that aims to provide the region with skills and tools to use X-ray techniques for developing innovative solutions to critical issues in Africa. The initiative is the result of an interaction between the Lightsources for Africa, the Americas, Asia, Middle East, and the Pacific (LAAAMP) and the Sèmè City hub, one of Benin Government's flagship projects, which aims to create a world-class knowledge and innovation centre in Africa. The goals are to: 1) provide hands-on experience with the use of cutting-edge X-ray equipment, 2) develop X-ray-based problem-solving skills targeting specific socioeconomic issues, 3) meet the requirement for Feeder Facilities that allow the preparation of samples to be studied at world advanced light sources and 4) contribute to the emergence of a community of experts who will be active users of the future African Synchrotron.

Learners participating in the X-TechLab are trained around 2 parallel, interrelated yet distinct, tracks: Crystallography and X-ray diffraction techniques, including both single and powder diffraction applied to structural studies; and Absorption and phase contrast X-ray imaging (Microtomography) using mathematical tools for research on sustainable and ecological materials. Started in 2019, X-TechLab training sessions gathered many scientists from several countries and scientific disciplines. As shown in the figure below, 84 participants with 1/3 of women from 12 African countries (Benin, Burkina Faso, Burundi, Cameroon, Congo-Brazzaville, Côte d'Ivoire, Democratic Republic of Congo, Ethiopia, Ghana, Nigeria, Senegal, Togo) have been trained [2]. About 20 Experts from several academic institutions worldwide (Africa, Europe, USA) are involved in the training sessions. This will emphasize the unique potential of X-ray techniques as a multidisciplinary tool for development in Africa.

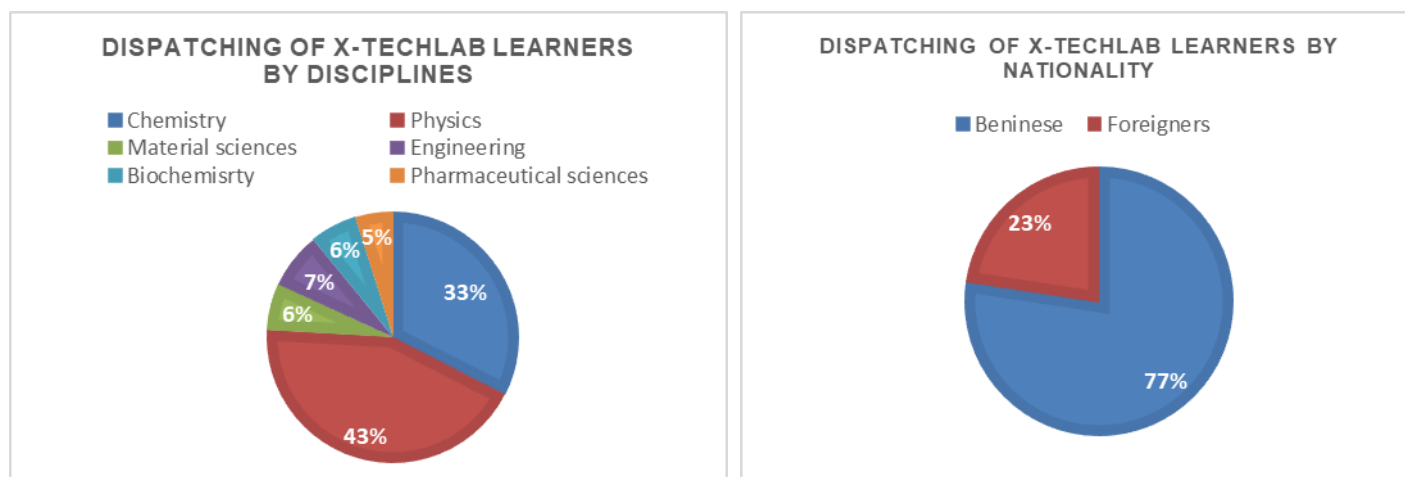


Figure 1. Dispatching of X-TechLab learners by disciplines and nationality.

[1] UNESCO and International Center for Engineering Education (ICEE), (2021), Engineering for sustainable development

[2] <https://www.xtechlab.co/en/>

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