



Operationalizing Higher Education for Innovation, Industrialization, Inclusion and Sustainable Development: Key Issues and Needed Actions to Move Africa Forward



The training delivered by many universities in Africa is not employment-oriented. There are inadequate links between training programs, capacity building, skills and the labour-market. There is therefore a growing mismatch between the needs of employers for graduates with employable skills and the skills possessed by the available workforce and job seekers. There are three key issues responsible for the mismatch. The programs are:

- a) Not relevant to the needs of the community or not demand driven
- b) The teaching methods are not designed to enhance creativity
- c) Training job seekers and not entrepreneurs who will create jobs for themselves and others and hence enhance industrialization.



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Relevance of Training

There is a need to transform the training and research programs in High Education Institutions (HEI) in Africa to respond to the needs of society or community. These programs need to be revised on the basis of what the community needs. To achieve this, HEIs have to work in partnership with stakeholders in their communities to assess their current and emerging needs. Research and Training programs will therefore be designed to address these issues. The research agenda will be developed through community engagement to identify challenges or problems before HEI can engage in research to come out with innovative solutions to address them. In so doing, the adoption of innovations will be greatly enhanced because they will be addressing the real needs of the community.



Enhancing Creativity

The model of teaching needs to move away from being teacher centered where students are spoon-fed to retain and reproduce information in examinations to a student-centered approach where the teacher is a facilitator or coach. This approach will enhance the creativity of students and lead to increased innovation.

There are various models that have been proposed to explain the role of education and research in the thought and development process. The pipeline or linear model in particular is based on the proposition that knowledge is the engine for economic growth thus by investing in man power development at one end of the line results in new ideas delivered at the other end of the line. This model stresses the need for a sound educational system that is not skewed towards any specific discipline but emphasizes that once knowledge is gained it can be invoked in the resolution of difficult questions in a rationale and objective manner – creative thinking! The spin-off model in a complimentary manner argues that knowledge acquired through proper training leads to innovation and the invention of products that were not the primary motive of the training. For example, a software engineer who develops a new application after training in an engineering school may eventually set up a new company to produce and distribute the application. This product was not the motivation for the training but is a by-product (spin-off) of the appropriate skills gained in the course of the training. Spin-offs such as new drugs, smart phones, and standardized manufactured products have led to the establishment of several companies that continue to employ millions of persons across the world. HEIs on the continent need to rise to this expectation.

Enhancing Industrialization

Many innovations in HEIs tend to gather dust on bookshelves in Universities either because these are not relevant or because there is a disconnect between HEIs and the private sector. To bridge this gap, HEIs should train graduates who are entrepreneurs who can conceive an idea and translate it into products that satisfy the needs of society through the creation of start-up companies. The current mission of many HEIs is obsolete and was designed to produce workers. African HEIs need to expand their mission to include; innovation and industrialization to enhance the employability of its graduates in addition to the traditional missions of teaching, research and outreach. The training programs should produce graduates who can mine natural resources; cause industries to grow or manufacture goods. It is in so doing that we will be enhancing the industrialization of Africa and advancing socio-economic development of the continent.



The transformation of engineering and technology practices in Africa to meet global standards requires financial, legal and policy frameworks all building on sound education. Science, technology and politics are not mutually exclusive. Political skepticism in the sub region must give way to the freedom that science and technology need to develop a truly productive process of knowledge acquisition and skill development. Science and technology remain the best means of analyzing and assessing issues and politics must rely on scientific advice, chart the course of economic growth and ensure proper funding. Scientists, engineers and technologists must therefore find common ground on which to share ideas and improve lives in the sub region. This conversation must terminate in radical changes in HEI cultures as presented above. The administrative framework for the economic emergence of Africa comprises three inter-related aspects, namely:

1. New technologies must be embraced. These technologies can build upon indigenous knowledge and have to consider sustainability, efficiency and environmental/social acceptability. Examples include developments in telecommunication and IT, remote sensing, robotics in engineering practice and manufacture, certification units, quality and standards control systems etc.
2. Prioritization of development objectives through an open and participatory stakeholders' approach. Prioritization functions in concert with the identification of challenges expected for each development goal. This way private sector can inform on training programs at HEIs to meet these expectations.
3. The establishment of regional technology hubs. The concept of regional centres of excellence if imbibed and implemented by governments and Universities will allow various countries in Africa to focus on domains where appropriate local know-how exists and the resources to facilitate innovation over the specific domain are readily available. These hubs can develop only on the back of startups and incubators housed in HEIs.

Already the African Union (AU) is working on such plans and two are worth mentioning here. The challenge is for HEIs to bring these initiatives to bear in their training programs. The AU's Alliance for Accelerating Excellence in Science in Africa (AESA) was adopted by the AU Heads of States in January 2015. AESA seeks long term development through research and technology leadership excellence and innovation that impacts on Africa's development challenges. It calls for the mobilizations of national know-how and the leveraging of domestic financial resources to stimulate the transformation of living conditions through appropriate technological inventions. Another AU framework is the Science, Technology and Innovation Strategy for Africa 2024 (STISA) which envisages development strategies for Africa based on the needs of its people. Obviously, these needs vary from one geographical and economic grouping to the other thus Africa must have a say in what constitutes its priorities. STISA encourages the emergence of environmentally acceptable practices



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that have been the hall marks of rural activities in Africa and it calls for insights into climate change adaptations. STISA encourages technologies that will reduce imports and spur innovation. Finally, the training programs of HEIs should not imitate others, else we will always be trying to catch up but we should be ourselves and chart our own path to solve African problems.

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