

Research Tools: Availability and Defects in the Contemporary African University Landscape

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Abstract

Universities in Africa, particularly in Sub-Saharan Africa, can make a significant contribution to good research and guide policy-making by generating, nationally, relevant data and evidence. But there is dearth of information of how to carry out adaptive research that can strategically revolutionize Africa. In this paper, an esoteric shift exposes the needed research tools that are critical in supporting universities in Less Economically Developed Countries (LEDC) poor countries such as Cameroon and Kenya to train and nurture sufficient, internationally, competitive researchers. In the paper, we qualitatively and descriptively analyze the difficulties faced by universities in Cameroon to develop a coherent strategy which would identify and remedy deficiencies in their university training programs. We admit that there is, currently, no single process that can be used to evaluate all the components needed to make these programs successful. The pursuit of funding, grants and academic grade changing by most African researchers and university lecturers have bedeviled the academicians' preoccupation. To this effect, most professors have invested more efforts toward addressing funders' need with a gross compromise on swotting hard core bench research that could, potentially, address fundamental research questions or gaps in their various disciplines. These are contemporary challenges seen in the African University landscape particularly in Cameroon and Kenya. The language within this article is, purposefully, kept simple for wider multidisciplinary readership.

Keywords: Cameroon, Kenya, University, Research, Tools, Defects, Availability, Africa, Development

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1. Introduction

All nations have always had problems. When a solution is found to a problem a nation makes progress. If a solution is not found, a nation does not make progress, but poses a challenge that cannot translate to any opportunity. At the heart of the ability to find a solution asking the right questions and having the necessary information necessary to solve the puzzle. Therefore, the generation and use of information or knowledge have always played a crucial role in humankind's long march from the cave period to the present. Today, we speak of fundamental human rights to food, shelter, clothing, energy, good health, education etc., in contrast to the conditions that prevailed at the time of our ancestors who hunted for food, with no shelter, clothing and were exposed to the risk of living in the wild as other animals.

The transition has been a long and hard one, but the initial knowledge of starting a fire, localizing agriculture, making pots, smelting ores etc, has made all the difference. The diversity and independence of thoughts, the cooperative and curious nature of humanity, his or her ambition and use of history have all combined to change man's lot and place within her present circumstances. Suddenly, or rather now, people live healthier and longer lives, the speed of travel has skyrocketed, and wealth and comfort are unprecedented.

Through this evolution the key weapon and ally has been knowledge (and this is still the case), Nations that place priority on seeking knowledge, using it and putting in place mechanisms to facilitate knowledge discovery/use are usually now described as advanced or developed. Those that do not are 'developing' or 'underdeveloped.' Too frequently, many of people confuse this classification for politics and do not see the damage of the concrete evidence to our psyche.

Some features are noticeable within nations that are active in the generation and use of knowledge is that the economies are highly productive, i.e. the gross national product is high. The fundamental rights that we spoke about earlier are recognized and respected. There is a relative high level of justice and fair-play. The leaders generally know their limits and see themselves as servants who have the rare opportunity to leave their marks on the culture, prosperity and integrity of their nation. There is a high level of efficiency in the provision of services. There is little or no idleness.

Politics is minimized, and cooperation is emphasized over destructive fights. The people are confident and are proud of their culture, country and are generally better citizens. There is the benefit of trust. Arbitrariness is minimized. There is openness in the education system to receive outstanding scholars from anywhere, and the political and economic systems are relatively stable.

In the case of nations that are not active in the generation and use of knowledge, the general features are as follows: The gross national products are low. Fundamental human rights are more of a song than reality. Justice and fair-play are alien. Leaders are most likely rulers with a track record of misrule. Services are inefficient. High level of idleness for the employed and unemployed. Politics is everything and this tends to emphasize fighting over cooperation. There is a private, general lack of confidence and most people even begin to hate their national origin and citizenship is generally a challenge Arbitrariness is rife. Trust is generally absent. The Educational system is rigid and unattractive to scholars, and political and economic instabilities are the hallmark of these nations.

Within this article, we have gone out of our way to draw these distinctions to highlight the place of research in our national psyche. We need to acknowledge that the self worth of an individual is innately tied to his work and the achievements of her society. The individual and the society feed off each other and are related. The achievements and well being of the individual are checked by societal achievements and well-being and vice versa. It is suspected that most wealthy Africans know that their money cannot to deal with the present irksome condition. And adds an additional psychological burden that wears out both the common man on the African streets and, yes, he or she at least has the means to do it. Yet, the wealthy are just as much a victim in their society as the poor.

It is then clear that the business of generating and using knowledge is an important one. In the development of awareness through knowledge and its application to societal challenges, citizens are empowered to resolve their issues. Very different from the un-contextualized research and solutions observed externally, which are often agenda driven. The citizen can remove their chains of hopelessness and helplessness that defines poverty.

In the next paragraph the authors begin to highlight some of the crucial tools that are needed in African universities, namely in Cameroon and to some extent in Kenya, to generate applicable knowledge or to do research. To set the pace right, we have alluded to research products as a combination of ideas, discovery and innovation. Research and innovation does require careful observation of facts, their collection. Though empirical research which is evidence-based analysis its topic to use and generate knowledge, so assist with awareness, societal solutions and in some cases policy. Research in innovation, is more an application of research to produce and generate a level of income. The business of knowledge generation, its use is research, and application or action, still remains a daunting challenge in Africa.

2. What tools are needed for research in Cameroonian Universities?

All genuine research is a search for knowledge of “truth” and its application in the practical/theoretical resolution of some problem or other. As earlier mention the research may be defined in four ways: Research for research sake, evidence-based research, applied research and Action research. But in spite of this we can assume that, first; all searches for the truth involve a certain disinterest from personal material gain. The catalyst to discovery has always been the finding of an answer that quietens intellectual disquiet born out of the “w” and “h” words- that is the ‘What’, “the why”, the who”, “the when,” the how”. Did a Newton, an Einstein, an Adam Smith or a Ratzinger do research because they were looking for an academic promotion and a better pay package? No. Yet that seems to have become the reason for most research on the continent today. There could be a number of good reasons for this, such as poor pay, but it does not take away the importance of being earnest. However, with this kind of mind-set, publications are rushed and substandard results are inaccurate and sometimes downright false, all in the name of “truth”? Or is it money and fame? It often fosters corruption, for example you pay someone

else to do your work or simply buy the position. These are all contrary to the search for knowledge with our God-given capacity to think, explore, discovery and resolve, all housed in our brain.

The availability of skilled and talented staff is a must if the goal is high-quality research output. The university landscape in Cameroon and Kenya, like many other African countries is far less productive (Maher, 2006). During the very first African science fair held at Makerere University in November 2012, it was stated that Africa is unable to even contribute up to 0.1% of total science innovation in the last decade. Additionally, in the last five years higher educational rankings of the best and most productive universities in the world can barely have an African university among the first 200.

To a large extent this may be partly as the result to the lack of research tools, of which is our focus. Africa probably parades the most diverse and highly trained group of academics in the world, who have been exposed to the majority of skilled and talented people in the western and other nations, yet, their performance and output have been far less than their patented potential (Pearce, 2003). For one thing, a sizeable number of them are outside the country because of the lack of research facilities in the country and sometimes because of poor remuneration. Too often, being able and sometimes due to financial constraints, a number of academics take up appointments with their governments whom hardly require their special skills and talents. The result is that a high percentage of experienced and skilled personnel are outside the research industry, often leaving behind a large number of mediocre and unskilled fraternities.

Further to this, a second important point is the lack of skilled young researchers to replace the older ones, of which they either retiring, pass away or outright leave the country for greener pastures. There are hardly any decent or suitable training grounds for the younger generation of researchers and as a result they are unprepared for the rigours, methods, and discipline required for research work (Tijssen, 2007). To make matters worse there is a lack of definite programs on the ground to 'harvest' talented graduating students. It is not uncommon these days to have students who have graduated with first class degrees roaming the streets, and no African universities showing any interest. What is really sad is that these same students would also help to build up the quality of the teaching fraternity, which is desperate for good staff to build the profile of their institutions.

A Careful study of publications in the various disciplines has revealed that there is a direct correlation between the quality of graduate schools and the quality of research publications. This would seem to suggest that the research for most countries on the continent is still likely to be carried out at the pre-doctoral and post-doctoral levels in universities. Countries with funding facilities for postgraduate students attract the best and greater number of students to their postgraduate schools, often contributing to brain drain. Research work requires discipline, focus and hard work. Students with financial backing in terms of scholarships, fellowships and teaching assistantships are spared worries about finance and they can usually concentrate better on their projects.

Continually, in our countries, there is virtually no funding available to nurture good and independent students. This adversely affects the quality and quantity of research work coming out from African institutions. The funding which is available is often from the west or east, which probably has their own interests. In most of our institutions, not only are teaching assistantships and research fellowships absent, but Government scholarships – both State and provincial – are often not a priority and rare, if they exist at all. Postdoctoral fellowships are unheard of, and the result of the absence of such funding is the absence and wastage of our youth from research training activities. It is noted here that these are probably the best years in the creativity of the human mind. Yet, we leave this resource untapped, unmotivated, and worse, dulled at best, or left to find ways to fend for themselves in criminal ways, at worst.

Referring back to research, with the advent of technology, areas such as neuroscience are revealing the importance of the use of our senses in observing the world around us. They are not only potent tools in the generation of knowledge, but also are the base by which we define our cultures, values, our reality and ourselves. Nonetheless, the equipment though expensive would be invaluable to redefine or deprogram the perceptions and stereo typing of media. The use of the microbial, atomic and sub-particle world; the money, other resources and management; the products of the human spirit, values, society and the relationships that make it up and Transcendent Reality Itself; these and so much more are just as important if not necessary to creativity and innovation, urgently required to sustain our environment and humanity. The whole area of neuroscience and cultural expression and all it entails for observation maybe of research

value, psychologically, though there may seem to other more important issues in LEDC's. These aids, though expensive, are invaluable for cutting edge research.

Additionally, over and beyond what has been said the above equipment are a class of facilities which are a must for most scientific research, and it is safe to say that any nation that plans to remain relevant in the future must invest on these facilities. In our country, these facilities basically absent and capacity needs to b developed to sustain them. The consequence of this is the relegation of our scientists and other academics to limited research activities.

Another important ingredient of research activity in Africa and in Cameroon in particular, is the degree of trust between and among researchers. This is critical as it affects the free-flow of information. It is not unusual to have a researcher disclose their preliminary results to colleagues before publishing. Indeed, one of the goals of scholarly conferences is to share new results and evidence with colleagues before the final step of publication. In the process, researchers come away with new ideas, new methodologies, and sometimes, answers to some of their questions. In our Cameroon and in Africa at large, the issue of trust is corrosive. The series of failures in the various sectors of the country, amidst political and economic challenges, and the various interpersonal and inter-group squabbles have worn out trust between folks. The result is that most people are usually evasive in sharing information and this has also affected the attitude of most African researchers.

Most research projects are therefore usually done in isolation, piecemeal and without coordination. Group work is difficult in conditions without trust, and cooperative efforts are rare in most African universities. Yet, it is practically impossible these days to have discoveries and innovation as the product of one individual's mind or efforts. Never before in the history and evolution of universities, have academicians needed each other more, and never before have we spent so much energy as a continent to build distrust. It is no exaggeration to note that the results of our past suggest that there is no alternative future for the search for knowledge than one of multidisciplinary or even transdisciplinary collaboration. With dissolving boundaries, we arrive at better solutions for the challenges we face. Unfortunately, In the face of distrust, boundaries are re-enforced and our vision becomes more parochial, knowledge itself becomes more compartmentalized, and energies and resources more dispersed.

A related point is the degree of flexibility of an individual researcher to be part of a team as well as being able to interact with researchers with entirely different backgrounds and other departments. This type of flexibility is mandatory for an interdisciplinary and transdisciplinary approach which we earlier mentioned. This is a critical consideration for the universities of this dispensation or new universities to build their profile. A close look at a number of publications reveals that the rigidity in research work and similar forms of collaboration is fast disappearing. Yet with the current emphasis on the link between development and environment, one would need the emergence of innovative and collaborative research teams in various projects to be relevant.

In all economies, governments remain the important movers and definers of the direction of various nations. In no area is this more pronounced than in research. In the period between the First World War and the Second, the German government decided on a goal, and through its funding lines, actively encouraged certain research activities. As a form of response, the British and American governments did the same to support their war effort. Since the end of the 2nd world war, most nations have defined goals and the funding of research is a priority. Japan identified a national goal and pursued it consistently and optimized all its institutions for that purpose. These governments appreciate the benefits to society that can derive from research.

The universities in Cameroon and Kenya require an overhaul with clearly defined Government policies toward research and development. In Kenya, there have been some attempts through National Council of Science and technology Institute - NACOSTI, though funding has may been sporadic, depending who is on the boards and in power. In Tanzania, on the other hand, through policy considered their academicians as an investment and decreed they be first choice in government development projects. Therefore as a country they have been more successful in integrating the academician and researchers' knowledge, skills and no-how for the countries needs.

There is no indication that the Cameroonian government has thought much about research. Or rather, efforts in this area that led to the creation of IRAD (a research institute in Cameroon for improved agricultural development), and other research facilities in the seventies and eighties, have fallen onto difficult times. The only grants to for researcher in these institutions are 'dreadful handouts' to individual or group researchers for personal projects that have no national

goals. It is generally rare in most African counties to have a deliberate, methodical, planned-out funding for any area of research that the government may have tied to a national goal.

In Cameroon, the year 2000 popular slogan, “Education for all by the year 2000” came and went, and we still lack a national focus. Kenya has a through the previous President Hon Mwai Kibaki, launched “Vision 2030”, and though it has not come yet, but signs of not investing in equipment, infrastructure, capacity building and R&D, in the newly founded Technical Universities that are to help the technical development require, indicate that it too may come and go. Cameroon and Kenya, like many other African nations remain largely consumer nations surrounded by goods produced and obtained from elsewhere. Oftentimes implicit in the funding of research activities by most governments involves a close, working relationship and cooperation between researchers and governments. It is common to read about various academies and the grants they disburse on behalf of their researchers in the various institutions.

However, with the absence of a noticeable national goal, African governments and researchers generally (especially researchers in higher institutions) end up maintaining a continuous adversarial relationship. Unnecessary battle lines are frequently drawn when, together, when we both could essentially chart an effective and positive strategy for both economic development and environmental consciousness. If the adversarial roles are de-emphasized, we may find that we actually agree on many more issues than we originally thought. This brings us full circle as to why we need to be a knowledge based society, and a method of how this could be achieved.

3. How do we breed adaptive research for an African industrial revolution?

At the core of industrial competitiveness is investment in research to generate knowledge, technologies and marketing strategies. In order to improve on the results, most companies now have research and development units that handle cutting edge investigations. The cooperation of industries and universities is an important bond that enriches research output. While this bond stems from the funding shortfall in financial resources, and expands corporate aid to universities, it also supplies the skilled and talented personnel to handle the pace-setting research required for industrial growth. This partnership is not only working well for the partners and nations, but it

also reduces the time lag between research results and their application to problem solving. In essence, the road between research and application is shortened.

In Cameroon, either most of our industries have not seen the importance of such cooperation or they cannot afford it. Therefore, there is little or no research in our industries. Within Kenya, as earlier mentioned, Technical universities have been setup to fill the gap that comprehensive universities have been unable to fill due to no orientation. Technical University of Kenya (TUK) is unique in that it has been the only institution that set up a Division at a DVC level, of which one of its duties under a directorate is to connect Academia with Industry. Short exchange visits and sabbaticals with industry are expected of the staff, which should help to change the output and type of research for both the industry and the university. Through Public, Private Partnerships, companies like Samsung have built workshops within the institution, which would not only train and develop future technicians for their products, but also allow general training and research within the same facilities.

Though this may still be a practice yet to be understood in Cameroon. As much as TUK has the structure in place for such partnerships, and is partly practicing it, there is still the challenge of the staff within the institution, the public and government officials, to appreciate what this new approach means in terms of commitment, support and investment of time, in addition to money. There is also the challenge of finding a mechanism where industry and academia can meet to fulfill their shared need in spite of their different functions. For instance, a major driver for all economies is energy. It is inconceivable that modern research can thrive without a constant and dependable source of energy. This is particularly true of scientific research whose strong features of observation and experimentation are dependent on special equipment.

For these reasons, the efficiency required from the energy sector is required to make the tasking business of data collection and analysis bearable. At the same time research-involving energy is necessary for industry, to make business sense in light of sustainable environmental requirements. The condition of performance or non-performance of the energy sector in most of our countries would not only make complex research and innovation perplexing, but would also make any relevant research outcome concerning energy questionable. There are frequent equipment breakdowns and the focus of the researcher is frequently thrown off because of power failures. And importantly there is not enough effective investment of the technical know-how

and capacity building of the technician, both to maintain the equipment and eventually be able to build it. Truly, the power supply, its sustainability in light of the Sustainable Development Goals (SDG's), and know-how in our countries must improve and become dependable if we are going to be able to make any progress (World Bank, 2005)

Closely related to this is water supply, especially for experimental research. Most experimentation in chemistry and biology, for instance, is impossible without water. The water supply must be good and consistent to support research, especially as most heavy equipment require water for cooling, washing, creating pressures, steaming etc. Distribution and shortage problems are our bane and a lot would need to be done to improve the services in the sector. And as researchers look for the solutions to their needs, they need to also see how these solutions impact, communities and industry, again where sustainability is concerned.

With the sophistication and delicacy of most scientific equipment has arisen the need, as earlier mentioned of skilled and technical staff to run and maintain tools is critical. Like the researcher, technical staff must have programs to train, retrain and improve their skills in diagnosing and fixing faults to keep equipment working, specifically and generally. In the older universities across Africa, the culture of maintenance is needed. Our attitude to technical support is pathetic. People are hired, left untrained and there is now no retraining program for the staff. Most of them are left idle, inefficient and frustrated. What makes it worse is that , like in the case of Kenya, the politicians, though they preach technical and vocational education and training, as well as, condone Polytechnics becoming universities, in the same breath they say, where will the failures go if those polytechnics are not there.

Therefore the youth have an adverse attitude towards technical know-how, and in most cases want to find ways of making money fast quick instead. So where will the technical knowledge and use come from? The base of all research work is information on related matters, and the storehouse of information is the library. An equipped, up-to-data library is an invaluable resource to the researcher. Books, journals, newsletters, magazines, microfiche and computer facilities, tapes, and reproduction facilities are some of the common assets in a library. In addition, libraries provide literature search services. Suffice it to say that most of our libraries are either empty houses or storehouses for obsolete materials. Public libraries are rare, and the result is that we are fast developing a generation of non-readers. As the saying goes, "if you want to hide

something from an African put it in a book”. We need to see and commit to a reading culture and that comes with libraries as a major source.

In many countries, the old and new are bridged or connected using the old is probably best illustrated by the Chinese. Researchers use the old as a base for developing ideas, discovering new things, and for innovation. Agriculture in China, for instance, is better integrated than in most other countries in the world. Researchers in agriculture in China use old agricultural practices as a base for their research. For this, they are ahead of the rest of the world in practicing integrated farming systems and have managed to largely bypass the negative effects of modern agriculture.

Now, they have some of the world’s best experts in integrated farming, and with the current drive to draw inspiration from nature, everyone is now trying to ape China’s agricultural practices. Additionally, Asians have developed their medical system while in Africa, effort or support is given to do the same. In Cameroon and Kenya as in most African countries, medical practitioners and researchers are cut off from most cultural practices and sometimes look down on them. And if indigenous knowledge and practices are explored it is often out of necessity or business, as is the case in Kenya. The result is that without, the indigenous base the local implementation of research and its relevance not only expensive but also inflexible.

Remuneration of researchers is also an important incentive for researchers, as it is for other workers. In some of the advanced countries, the salary-structure for researchers is individual-based rather than flat for all workers. In this type of system, the salaries for individuals even with the same rank are different depending on their research output. If there were two professors, for instance, with one active in research and the other a bit less active or inactive, the active professor would draw a higher salary than the inactive one. This categorization is yet to be understood in most African countries including Cameroon and Kenya. Such a system does not only reward hard work, but it discourages laziness. Often the good, the bad and the ugly are all placed on the same salary and the competent and good researcher is discouraged from working. As earlier mentioned, the Tanzania’s approach maybe another way. Those who work on the projects will gain additional income over those who don’t.

4. What is needed to catalyze research in new and emerging universities in Africa?

To encourage productive research, there are several areas of special need for incremental funding. Some of these are faculty compensation, students' aid, academic programs, library resources, teaching and research equipment, research support, physical plant facilities, and other facilities. Of all human activities, relevant research is the most important in addressing human needs and providing applicable solutions, but it cannot fulfill its promise at the present levels of financial support. We cannot continue for much longer enjoying the benefits of research for research sake? And not contribute to this activity as active participants.

With the benefits that a society can derive from research activity, there is the need to attract more and better students to careers in research, and improve the public/government perception of this activity, as well as work have industry as partners. The private universities in Cameroon such as the Catholic University of Cameroon can play a larger commitment of time and effort through her researchers on the generation and use of knowledge, and also to communicate the importance of research to African governments and people. And new Technical Universities in Kenya can continue to work on ways that they may engage industry, mentor TVET institutions, and incubate innovative designs and solutions, through R&D and demonstrate the relevance and role of universities in sustainable development. This is unequivocal in order not to end with a future generation that would feel inferior, disempowered and have no sense of dignity.

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In memory of the late Professor Michael Agho, for sharing his views on the African University to Dr. Kenneth Yongabi five years ago