A Newsletter of the Sokoine University of Agriculture Convocation

# Paradigm Shift in Input Support for Industrial Take-off



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Industrialization in different parts of the world followed different specific paths which in most cases were demand driven. There seems to be no single path towards industrialization that every country could follow with similar results. Historical view of transitions of agro-industrial sector in Tanzania sheds important light that can aid in revitalization of industrial Tanzania. Post-independence nationalization of agro-industries was partly not successful. The setbacks

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## Speaking of Science Development: Contribution of Academic Research and Fascinating Juniors' Achievements



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I have always been fascinated by Science but most of all, by those who contributed significantly to its making and impacted on our life. The laws of motion and universal gravitation in Newton's *Principia* have survived for over three hundred

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# *Speaking of Science Development: Contribution of Academic Research and Fascinating Juniors' Achievements*

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years, and have remained the bases for classical mechanics. Then look at Kepler's *Astronomia nova* that brought understanding of the planetary orbits. At that time, we had no satellites, no scientific calculators, and no shuttle radar yet, the quality of the explanation hardly can be outcompeted by laser precision. Historically, these inventions were largely linked to University personnel and education, the academia. Of course, we cannot forget societal civilization invention of Egyptians wigs, Water clock, Surgical Instruments, The Ox-drawn Plow, and many others including the confusing origin of the never outdating abaci.

When I read our University vision, which is founded on quality knowledge and skills, I find it good to re-examine how we are truly for these. My personal question is thus: have we learned from previous historical achievements, errors, corrections etc. towards this vision? Let me remind you some achievements that changed our world and serious errors of seniors in different academies of past time by reviewing some scientists' life histories.

Svante Arrhenius was a physicist. His dissertation was judged not impressive to the professors so, given a fourth class. Upon his defence it was reclassified as third-class. In 1903, this same work earned him a Nobel Prize. Albert Sabin is another known medical researcher highly credited for the invention of the oral polio vaccine. It has been estimated that, in its first two years of worldwide use, the vaccine prevented nearly 500,000 deaths and five million cases of polio. However, somewhere he is quoted saying, "Sometimes it is not good to know too much." This was a reaction to the rejection of some of his ideas by the senior virology professor. Another scientist is Louis de Broglie who made innovative contributions to quantum theory in his Ph.D. thesis. Later in 1929, he won the Nobel Prize for Physics but remember, he received his first degree in history! He would later learn mathematics and Physics, again receiving a degree in physics.



**Prof. Marie Skłodowska Curie**

I have tears of happiness when reading the history of Marie Skłodowska Curie, who pioneered research on radioactivity. Her achievements are admirable too. She was the first woman to win a Nobel Prize, the first person and so far the only woman (to my understanding) to win twice the Nobel Prize, the only person to win a Nobel Prize in two different sciences i.e. in Physics (1903) and in Chemistry (1911). What we need to note is the fact that she grew up in difficult, struggling life condition. I lastly refer to Albert Einstein. He was a theoretical physicist known for his theory of relativity. Note that, his thesis was supervised by a Professor of experimental Physics. He was the deriver of the world's most famous equation, mass–energy equivalence formula. In 1921 he received a Nobel Prize in Physics not for the famous formula rather for his other contribution, specifically for his discovery of the law of the photoelectric effect. Einstein's father wanted for him to study electrical engineering but this never happened. I am reading that Einstein failed to reach the required standard in the general part of the examination for the Swiss Federal Polytechnic in Zürich. Fast forwarding his history, the year of his Ph.D. award was the year of his four ground-breaking papers; his *annus mirabilis*. Four years later he is appointed associate professor. Now, assess our academic practices and achievements against these few selected.

$$E=mc^2$$

Albert Einstein's famous formula

On: Anything having mass has an equivalent amount of energy and vice versa

I am not certain as to why we have not managed to have achieved close to these past levels. I am certain that we are not likely to be there, anywhere in the near future. This is because our education has followed the classical referenced assessment methods. We are changing

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with difficulties and resistance while knowing those being appreciated for record-breaking invention were navigating towards a different course. It was an inventive way of studies. I am creating a scenario which is now in our schools, colleges and universities. We have set our standards of schools, where opportunities are linked to family's income. In our families, we think, the so called good schools, colleges and even Universities are those where we pay so much, where we have a lot of students scoring higher classification levels of their performances, the divisions and the GPAs syndromes. Probably yes but history never created popular scientists from exclusive schools and colleges for the few. Actually, the above were at moderate schools and some kept on shifting from one place to another. These few cited, with exception of Louis de Broglie, they were from poor to ordinary families. Today in 2017, why do we think of making ingenuity out of our big pockets? I tend to believe that, we are just entertaining our children, starting with press-and-play toys, readymade kites up to higher levels where we excessively guide our study investigations, reporting system with the measurements of document margins and colour of the document, the chapter arrangements, etc. This is what we call quality. I will again try to explain the existing life scenarios at African Universities where each of them struggles for the so called good or best students, meaning those with higher scores as their pre-requisite.

Applicants with no such needed higher pre-requisites grade are likely to have less attention as Universities select their students. Say, you aspired to be an agriculturalist so; you apply for the training at the Sokoine University of Agriculture (SUA). SUA uses its five years old set criteria to scrutinize your application then realized that your passes don't tally with the needed pre-requisite. You get reserved just in case some will not be appearing for admission. Somehow, this information is not communicated to you, at that near end country border, where communication is by the service providers of the neighbouring country but, you are in a rush to meeting the Higher Education Students' Loans Board deadline. You are in a panic and suddenly you are invited for reapplication but, with limited options to specified degree programs. Obviously, out of desperation, your application will be based on the need to be at the college for studying anything. My supposition is that, you are in need to be selected to pursue anything at SUA.

At the University you are assigned an academic advisor, who will be advising you to pursue this anything. If you read my above historical excerpts, you realize this is what happened to Einstein's initial education undertakings. Now, the challenge is that you are not sure of the end mark of your study journey. Our students are in a situation like this and we are probably victims of similar situation. Our graduates are in chaotic motion trying to fix themselves where someone wanted them to be, just like Einstein's father. Our Universities are trying to have an 'international' recognition, to be called Centres of Excellency which in reality is of its kind and levels because if we are to be so, we the contents need to be excellent. How can that be whilst we are most probably products of such previous background of taking anything available?

So, we are embracing the idea that more publications mean our might and authority to a particular field of study. At my age I can say with confidence that, this is not the fact. I might be beating myself up but let facts prevail by superseding our theoretical quest of being recognised intellectuals. I need to show my intellect, I need to admit in the first place that there must be a different way of showing our achievements in academia. Higher numbers of publications have nothing to do with our quality. It may be so but not necessary. Closely, what you see is that all the best achiever of that time, did so as they were finalizing their thesis and they were almost all survivors of chest-beating professors. See Arrhenius, Sabin, Einstein and all in that line.

The bad thing is that we are not alone, it is a present world phenomenon. We have accepted the phrase "Publish or perish" to denote the force in academia as the only way for furthering our career. This is the worst thing especially on our side since it has been accepted while actually we have not done significant contribution in the world of science. Probably, it will be difficulty to get out of this long-learned publishing appreciation. We need to publish for documentation and communication or dissemination purposes but let us publish significant observations. I can testify that when I am asked to submit a Curriculum Vitae (CV) for consideration to a managerial post, I do it with an enthusiasm of loading it with a long list of publications which

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# *Speaking of Science Development: Contribution of Academic Research and Fascinating Juniors' Achievements*

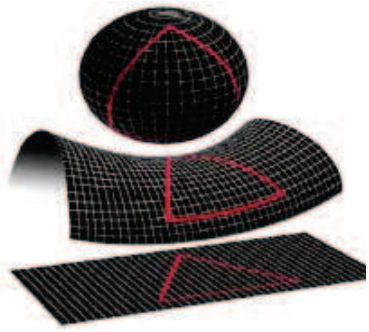
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I consider are the testimonies of my might. This is purely based upon point counting promotion syndrome.

Universities are where high quality publications and inventions are expected. We still say that is what we want but how can you harmonize the need for high quality research output and the need for high number of publications? The fact is, we will still witness half-cooked publications just for the sake of hunting promotion points. Sadly, the only so called quality in some institutions is almost the making of criteria that makes difficult advancement, which actually doesn't add to quality.

We all note that, publishing process has become easier than before. Where you needed a day of drawing and redrawing a curve and its asymptote, it is now a task of few minutes, leave alone a regression line and its equation on the x- and y-axes. Where you needed days of postal address operations for your manuscript to be at the editor's office, it is now a few seconds uploading and confirmation feedback task. Look at the disappearance of paper journal from our libraries. We came to CD ROM access and now online journals. Do we still believe in making a publication being a work of intelligent people and a measure of quality research outputs? From the history of successful inventors, do we still believe that we have a robust method of recognizing would be best thinkers and best researchers? We count the publications to making our superiority while knowing Svante Arrhenius and Albert Sabin did out-rightly achieve than their supervisors at their junior level. I feel making an accusation that; their supervisors were out of touch with their studies. We set the GPAs, we use A-level results, and we fix students interests against their performances at secondary school levels while we have learned how De Broglie managed Mathematics and Physics after pursuing a degree in History. We have similarly learned how Einstein was denied admission to a college he preferred, later to be a man to refer to.

My conclusion is that we have a long way to go, if at all, we have started moving. Our quest for improving academic excellence is not properly thought as a result, we are 'killing' science researches through these so called promotion criteria which hunt for large numbers of publications with limited ways of realizing their quality. We use premature researches to conclude something for a publication. Our research agenda at national and institutional levels claim targeting our national problems but some of what we call national problems are actually personalized inconveniences. It is obvious to us all that, when personalized inconveniences are reckoned as national problems, the consequence is short lived projects, plans and/or policies. On the other hand, consider the frequent shifting target of the Higher Education Students' Loans Board. It was science courses, then those with higher performances, then those from needy families and it is now almost saying to those who never studied at private schools. It is here today, gone tomorrow characteristic. Outcomes of such are obvious: while we need to at least be able to copy technologies, we all see that we even cannot copy technologies for our development then, how can we innovate? I have been following the current approach to innovations where nature's time-tested patterns (Biomimicry) are becoming very useful to solving human challenges.



*The three possible options of the shape of the Universe*

I hope that we in higher learning institutions will stop going for cheaper advancement. However, this should be catalysed by a system which will demand for achievement that tackles true nature challenges and not human-induced problems like promotion needs, deliberate conflicts, etc. then we come with easy way of manufacturing publications while another comes with a proposition to initiate a course called "Conflict resolution" after good experience in conflicts. We can say no to these but, the way I see it, this generation may not be part of any significant achievements, at least in the science arena. Juniors (by University ranking system) are a good starting point for change if the seniors will see this problem. History says so. You never know because so far the shape of the Universe is not yet definite. Look how others are trying to define the universe in different Options.