Introduction

In 2014 by the powers conferred on him by the Charter of Mbeya University of Science and Technology, the President of the United Republic of Tanzania appointed me Chancellor of the University. It is an appointment I accepted with humility and a deep sense of responsibility. For a University in any country, is the pinnacle of education, the highest centre of learning. The aforesaid could be the reason as to why universities have enviously been referred to as “Ivory Towers”, a term I will revert to in the course of my lecture.

As would be expected, before I decided to share with you some thoughts about the role that I believe MUST could play in furthering the ambition of the Nation to rid itself of absolute poverty, and indeed poverty itself by 2025, and critical as a university should be I prepared myself to answer the question from you as to the legality of my being with you today. I had to revert to the MUST Charter 2013. For Article 9 of the Charter underlines the awesome responsibility of the Chancellor as “the head of the University”. A sigh of relief follows when I read my responsibilities: to confer, in the name of the University, degrees, and grant diplomas, certificates and other awards.

The responsibilities of your Chancellor are further stipulated in the Mbeya University of Science and Technology Rules 2013. In accordance with Section 3 Sub Section 5, the Chancellor has “...the right from time to time, to direct, an inspection of the University or an inquiry into teaching, research, consultancy or any other work of the University”. I must at the outset state that I have not come to invoke my powers under that SubSection. Yet I believe Section 5(d) and 5(e) could be the most relevant. For according to SubSection 5(d) the Chancellor has the “power to direct for visitation to the University and Constituent University college(s) in such a manner as may be appropriate or prescribed”. SubSection 5(e) of the MUST Rules 2013 is perhaps most relevant and should be non controversial in my case today. For, “the Chancellor shall provide advice and guidance to the Council as he or she may consider necessary for the betterment of the University.” This SubSection of the Rules is a near perfect definition of Visitation by the Chancellor. Under the cover of that SubSection, therefore, I wish through this public lecture to share with this assembly, my reflections, experience, thoughts, perspectives, and advice to the University leadership and community at large, as we shoulder together the responsibility of guiding and developing this young institution in this young and developing nation of ours, guided by the National Development Vision 2025.
The Vision of the University is as wide as it is comprehensive, that is: to become the leading centre of excellence for knowledge, skills and applied education. Knowledge has aptly preceded skills and applied education, and rightly so. For knowledge is the precursor to the building of a knowledge and a learned society. We sometimes use the term knowledge in a cursory manner. As givers and recipients of knowledge we are reminded of the words of extreme wisdom that have remained true over the ages. In a treatise on the importance of knowledge and education to society, Imam Ali bin abi Talib, who lived a millennium and half ago, from 21 March 598 to 28 February 661 AD had these words of wisdom to impart to us and generations to come:

No vessel is limitless, except the vessel of knowledge, which expands forever.
If God were to humiliate a human being, He would deny him knowledge.
No worth equals the mind, no poverty equals ignorance, no heritage equals culture, and no support is greater than advice.
Wisdom is the believer's quest, to be sought everywhere, even among the deceitful.
A person is worth what he excels at.
No worth can profit you more than the mind, no isolation can be more desolate than conceit, no generosity can be better than decency, no heritage can be more bountiful than culture, no guidance can be truer than inspiration, no enterprise can be more successful than goodness, and no honour can surpass knowledge.
Knowledge is superior to wealth. Knowledge guards you, whereas you guard wealth. Wealth decreases with expenditure, whereas knowledge multiplies with dissemination. A good material deed vanishes as the material resources behind it vanish, whereas to knowledge we are indebted forever. Thanks to knowledge, you command people’s respect during your lifetime, and kind memory after your death. Knowledge rules over wealth. Those who treasure wealth perish while they are still alive, whereas scholars live forever; they only disappear in physical image, but in hearts, their memories are enshrined.
Knowledge is the twin of action. He who is knowledgeable must act. Knowledge calls upon action; if answered, it will stay; otherwise, it will depart.

These words of wisdom were translated by Imam Muhammad Abduh in Beirut in 1985 from Najih al Balagha (Peak of Eloquence), which are extracts of the quotations by Ali ibn Abi Talib as quoted in the UNDP Arab Human Development Report 2002.

By way of general information, Imam Ali ibn Abi Talib was the cousin to Prophet Muhammad(SAW-Peace be Upon Him). He was also son-in-law to the Prophet, having had the hand of the Prophet in the marriage of his daughter, Fatima Zahra. He was a prolific writer of his time, an authority in Arabic language, literature and grammar and Islamic theology. I have often quoted Ali ibn Abi Talib whenever I am invited to talk to students and teachers at all levels, if only to remind them, and us all, the benefits of pursuit of knowledge. For you will agree with me about the timelessness of his wisdom. It is a reminder to us all here of the gift given to us by society so that we may acquire knowledge, through education, for the our benefit, for the benefit of society at large, and for posterity.

Acquisition of Knowledge through Education
Education is a process, formal and informal, that society has established for the acquisition and transfer of knowledge. In his treatise on Freedom and Development, Mwalimu Julius Kambarage Nyerere has succinctly defined the aim of education thus: *The purpose of education is to transmit from one generation to the next the accumulated wisdom and knowledge of the society, and to prepare the young people for their future membership of the society and their active participation in its maintenance and development.*

In order to serve that purpose, education is meant to develop a person in terms of knowledge and awareness so as to make one a complete human being. Education can be a formal process such as that provided by this University. Education can also be informal and correct for any shortfalls in formal education. For what you were not taught in school or college, the community and society are a lifelong university.

Societies have over ages acquired knowledge and wisdom that has enabled them to master the environment which has made them survive. Indigenous knowledge has been in many cases a precursor to the advancement of man’s understanding of nature. Geologists will attest to the truth of this assertion. In many cases indigenous knowledge of minerals has led to the discovery of large commercial reserves. The discovery of oil reserves has at times been aided by local knowledge of the occurrence of oil seeps. Irrigation works in highland communities are not a new innovation. Infact some of the new irrigation works designed by us engineers are but a mere improvement of old systems to cater for modern needs on the basis of current hydrology. My submission here is that as we pursue formal education, in particular at university level, we must have the humility to learn from, research on, acquire from, improve on, knowledge that may be available from the informal system and from those who have not been fortunate enough to go through the formal education system like our own.

Education is not only a prime mover of, it is also an indicator of development. It would appear strange that I should be talking about education to you at all. For, doing so is akin to poliselythising *born again* christians or converting to Islam a *muezzin* who calls out from a mosque minaret, for the *Adhan*, summoning pious moslems to prayer. I trust you will bear with me since this is the only way I can proclaim my deep faith in a vocation that I have benefited much from.

To appreciate education as a simple indicator of development one does not need to have a grounding in statistics or rocket science. The number of educated people per 1000 of the population is a simple indicator of, or a manifestation of development. Use this as an indicator it can differentiate a village from another village, a ward from another ward, an administrative division from another division, a district from another district, and one administrative region from another, in one country. It is also a simple, back of the envelope indicator that can be used to compare the development level between two countries and between and among developing and developed countries and between the developed and the developed world.

That we are gathered here today testifies to the power and effect of education, and our zeal to acquire knowledge. For we all are part of the education process and are at Mbeya University of Science and Technology as students in the quest for knowledge, or as lecturers and professors, undertaking the noble and at times challenging vocation of teaching. It is
education that will play a central and critical role in the nation’s desire and vision to rid itself of absolute poverty, to create a knowledge society, and for Tanzania to become a middle, middle income country by the year 2025, as stated in the National Development Vision 2025. The Vision is about the creation of a society that should be substantially more developed than it is now. In this context it envisions a nation imbued with five main attributes:

1. A high quality livelihood
2. Peace, stability and unity
3. Good governance
4. A well educated and learned society, and
5. A competitive economy capable of producing sustainable growth and shared benefits.

It was an honour and a privilege for me to be part of the Team that crafted Vision 2025. To attain a well educated and learned society and other aforementioned attributes requires a good and solid system of education from kindergarten to university, a system which is based on cooperation and collaboration among institutions of higher learning and between universities and the wider community.

Cooperation and Collaboration among Institutions of Higher Learning and between Universities and the Community

The foregoing submission naturally brings me to the subject of collaboration between MUST and the community. The community I am referring to is the immediate neighbourhood, the impact area comprising of Mbeya City, Mbeya Region, and the Southern Highlands zone, the nation, and the international community.

In my opening remarks I made reference to universities, particularly in developing countries as “ivory towers”. With the exception of city centre universities we have campus universities which are unique in the sense that they are either isolated or, and thanks to the founders, are located on hills that make them easy to spot from afar. They “tower” over neighbouring areas, areas which are at worst slums, and at best unplanned. They are easily distinguishable. MUST is one such a “tower”. In respect of MUST, our immediate impact area is Iyunga ward. Everytime I make my way to the University I am intrigued by the fact that as university of technology we have not to date been able to design and implement the construction of the one kilometre road passing through the densely populated neighbourhood of Ikuti. Admittedly we are waiting for the City Council to construct a tarmac road. It may take eternity for the Council to do so. My considered advice is that we attempt to design and implement a stone surfaced road and drainage system as part of our civil engineering practicals.

Apart from the densely populated neighbourhood of Ikuti, our immediate impact area is our backyard, the planned but undeveloped area to the south. I am informed that half of the area has been acquired by MUST after compensation had been paid to the former occupants of the area. We legally own the rest of the area but can acquire it only after we pay compensation to the current residents. I have examined the physical plans of the area. May I suggest an improvement on what could otherwise end up to be a concrete jungle. We could set aside 50 acres say, and develop a botanical garden. The botanical garden could serve as the store for the flora of the southern highlands of Tanzania. Plants from all over the
climatic and geographical zone could be planted, identified, classified, and described using the science of plant taxonomy: the classification and subclassification of plants into distinct categories: Kingdoms, Phyla, Classes, Orders, Families, Genera, and Species. We will be playing our part in the preservation of endangered plant species at the same time as we provide an avenue for science learning, research, and leisure. As such, we will be doing justice to the “science” part of our name.

Mbeya as a city and its surrounding areas are in the impact area of MUST. Industries, large, medium and small size are usually drawn to a town or to an area due to the existence of a university. The reasons include, among others, the availability of skilled high level manpower, research facilities, technology development facilities, and encouraging and supporting business “startups”. We have to interact with the immediate community and the wider society through the provision of counselling, mentoring and other such activities as you may deem fit. Of course this has to be done in consultation with the community and the stakeholders concerned. MUST can assist small entrepreneurs in writing business plans. We can also assist young people, especially young women who need training in skills such as machine tool operation, electrical wiring, refrigeration, and motor vehicle mechanics. I recently watched a programme on Al Jazeera in which a mere school leaver, a young lady, Sandra Aguebor, founder of the Lady Mechanic Initiative (LMI), has been able to set a very successful programme that trains hundreds of young girls as motor vehicle mechanics across many states of Nigeria. To be relevant, therefore, the University has to be an organic part of the City and has to influence its growth in technology including information and communication technology (ICT), architecture, physical planning, manpower development and employment.

Globalisation has been enabled by rapid advances in science and technology. It is facilitated by information and communication technology. Universities have been at the forefront in the use, advancement of knowledge, and in fostering new advances and innovations in ICT. MUST has all the attributes to be a centre of excellence in ICT. As such we must develop an ICT Master Plan against which we will measure our successes and shortfalls as we keep abreast of advances in technology and contribute to the advances too. In the noble cause of service to society, I urge the university to extend its ICT network to the less fortunate neighbourhood of Ikuti. Only then can we measure the impact of ICT in development at the grassroot.

To be relevant to the communities around us and societies, it may be necessary for us to revisit our mission statement so as to embrace needs and challenges of the society of which we are part. We are part of Iyunga. We are in Ikuti. We are also part of Mbeya City, Mbeya Region, the Southern Highlands Zone and the country at large.

**Regional Zonal and National Cooperation and Collaboration**

It is said of charity, that it begins at home. Apart from MUST, Mbeya is host to a number of institutions of higher learning. These include the Teofilo Kisanji University, and branches or campuses of St. Augustine University of Tanzania (SAUT), Mzumbe University, the Open University, and the University of Dar es Salaam Computing Centre. Collaborative research, common use of facilities, exchange of appropriate staff and joint cultural and sports events
should be considered as part of university life. Mbeya is also host to an important agricultural research and training institution, the Agricultural Research Institute-Uyole (ARI-Uyole). MUST is at the epicentre of the southern highlands zone of the country stretching from Ruvuma, Iringa, through Mbeya and Rukwa. Agriculture is the mainstay of the economy of the zone. ARI-Uyole is therefore a natural partner to MUST in agricultural engineering training and research, in the development of new, improved and appropriate technologies for farmers and for the sustainable use of natural resources, and the development of an irrigation engineering course at MUST. Mbeya City is situated at the confluence of the great East African Rift system, within which are two African Great Lakes, Lake Tanganyika and Lake Nyasa, and a much smaller Lake Rukwa. The establishment of courses relevant to this lift system and the lacustrine environment; the science of lake ecosystems (limnology) and engineering, would seem to be an obvious choice for MUST to undertake, again in order for the University to be relevant to its immediate impact area and the nation.

One area where we visibly lack manpower as a nation is in the field of bio-medical technology and medical engineering and biotechnology. It is not uncommon for medical equipment to be imported and to lie uninstalled for lack of operators. Once the equipment is installed and malfunctions after a while it is either discarded or has to wait for technicians from abroad. With the Mbeya Zonal Referral Hospital and the Mbeya Regional Hospital within reach of MUST, this could be an area of collaboration which MUST could claim a first in establishing courses in medical technology and bio-medical engineering, and telemedicine in particular. I am glad that my advice on the establishment of collaboration between MUST and the Mbeya Zonal Referral Hospital is being acted upon and could lead to the founding of a college of medical engineering and allied health sciences, in line with our founding charter.

Tanzania is about to modernise the central railway line, upgrading it to standard gauge, to replace the existing 110 old, narrow gauge railway. TAZARA, a relatively modern standard gauge railway has one of its major stations and workshops in Mbeya, in the neighborhood of the University. It would seem to me that collaboration with TAZARA through use of common machine tools and other facilities could be advantageous to the University and TAZARA. The introduction of locomotive and railway engineering at MUST could contribute towards a national capacity in railway modernisation and construction and railway electrification. Ethiopia has recently inaugurated a electric railway line between Addis Ababa and Djibouti. It is also about to complete an electric rapid transit system in Addis Ababa. We also have to aim high, if not higher.

Four institutions of higher learning in the country belong to the same league, which could be referred to as Institutes of Technology Tanzania (ITTs). These are MUST, Dar es Salaam Institute of Technology (DIT), Arusha Technical College (ATC), and Nelson Mandela African Institute of Science and Technology (NM-AIST). Established under different legislations, they nonetheless share the same vision and mission. They complement each other. MUST could do well to establish links with these other ITTs and formalise such collaboration through memoranda of understanding. Indian Institutes of Technology (IITs) have been the bedrock upon which India has been able to develop technologically. They were initially created in order to prepare India for post-war industrial development. From the first IIT at Kharagpur established in 1951, there are now 23 IITs scattered throughout India, and administered under the Institute of Technology Act,1961. IITs have been declared institutions of national importance. If we are to achieve the goal of industrialisation as envisaged in Vision 2025, my
considered advice to Government is that our ITTs be recognised and declared institutions of national importance and be accorded the necessary support.

Universality of Knowledge and Knowhow as a basis of International Collaboration

Knowledge is universal. Knowledge has been the basis of, and has underpinned globalisation. Universalism as a concept has been a feature in the development of knowledge since medieval times. For centuries it was common practice for men and women of renown to cross national boundaries in search of ideas and ideals. Giving an historic perspective of the internalisation of knowledge and knowhow, the Late Professor Abdus Salam, Nobel Laureate in Physics recounted the following episode:

Seven hundred and sixty years ago, a young scotsman left his native glens to travel south to Toledo in Spain. His name was Michael. His goal was to live and work at the once Arab Universities of Toledo and Cordova, where one of the greatest medieval Jewish scholars, Musa bin Maimun, had taught a generation before. Moses ben Maimon (hebrew) or Moses Maimonides (greek) 1135 - 1204 AD had been court physician to Sultan Saladin, the famous muslim military leader, and also to his son, al- Afdal.

Michael reached Toledo in 1217 AD. Once in Toledo, Michael formed the ambitious project of introducing Aristotle to Latin Europe, translating not from the original Greek, which he did not know but from Arabic, then taught in Spain. From Toledo Michael travelled to Sicily, to the Court of Emperor Frederick II.

Visiting the medical school at Salerno, which had been given a Royal Charter by Frederick of Sicily in 1231, Michael-the-Scot met a famous medieval scandinavian, the Danish physician Henrik Harpestraeng, later to become Court Physician of King Eric IV Waldemarsson. Henrik the physician had come to Salerno to compose his treatise on blood-letting and surgery. Henrik’s sources were the medical canons of the great clinicians of Islam, Al Razi and Avicenna, which only Michael-the-Scot could translate for him.

Toledo’s and Salerno’s schools, representing as they did the finest synthesis of Arabic, Greek, Latin, and Hebrew scholarship were some of the most memorable of international assays in scientific collaboration. To Toledo came scholars not only from the rich countries of the East like Syria, Egypt, Iran and Afghanistan, but also from the developing lands of the west like Scotland and Scandinavia.

Then, as now, were obstacles in international concourse, with economic and intellectual disparity between different parts of the world. Men like Michael-the-Scot and Henrik Harpestraang-the-Dane were singularities. They did not represent any flourishing schools of research in their own countries. With all the best will in the world their teachers at Toledo and Salerno doubted the wisdom and value of training them for advanced scientific research. At least one of his masters counselled young Michael-the-Scot to go back to Scotland to clipping sheep and to weaving woollen cloth.”

The challenges of international concourse in education remain the same as they were centuries ago, especially for young students relocating to colleges and universities abroad. Apart from having to face unusual weather and climatic conditions, students from developing
countries have bear with the doubts of professors as to whether they are up to mark in courses in which they are registered. I am reminded of the remark of my undergraduate lecturer who asked me if I had gone to school in England. When I said emphatically, No, he wondered how I could excel in engineering studies having, according to him, lived in round huts in Africa and as such would find it difficult to comprehend the engineering concept of a straight line! When I graduated top of the class, he had the humility to apologise for the remark. At least he did not counsel me to return to Tanzania to herd cattle and live in a round hut.

I have learnt two lessons from Prof. Abdus Salam’s narration of the exchange of scientific discourse in the middle ages in Spain, North Africa and the nations east of the Mediterranean sea. Firstly, international exchange of knowledge is centuries old and in line with the wise words of Ali bin abi Talib, with knowledge expanding upon wide use. Secondly, the present day developed nations were at one time backward in so far as knowledge and specifically scientific advances were concerned. That being the case it is not far fetched to envisage the emergence of Africa as science and technology powerhouse. We have to work towards that end.

Back to the subject of MUST and international collaboration. Knowledge has to be sought, worked for, discovered, made known and used in order to expand. MUST should therefore go an extra mile to establish collaboration with international institutions that share the same vision. As a young institution it has a lot to learn from other well established institutions. MUST can fast track or leapfrog in many areas of scholarship through use of what has already been done as we place ourselves ready to innovate and add on to knowledge. Exchange of staff, internship for students, collaborative research and postgraduate training are some of the obvious advantages of cooperation among universities. In the last two years I am glad to have been able to introduce MUST to such institutions as: the University of Virginia, the Thomas Jefferson Foundation, Florida State University, Niger Delta University, Africa Roundtable for Sustainable Consumption and Production, University of Hartford, Adama Science and Technology University, the University of Birmingham, and Mountains of the Moon University. I urge Council and the Administration to establish, as soon as possible, an office that will be dedicated to collaboration between MUST and other institutions of higher learning and research. In the meantime, I will continue to use my position as Chancellor to seek cooperation between MUST and other institutions abroad to complement the efforts of the Council and the Administration.

Some Perspectives and Advice on University Teaching and Learning

Gender Disparity in Engineering Education

In order for our country to attain the goals set forth in the National Development Vision 2025, all of us as Tanzanians, women and men, have to work hard and diligently in our endeavours. We must also create opportunities for both genders to contribute towards the creation of a knowledge society.

Let us examine Tanzania’s education pyramid. For the year 2003 when I discussed issue of gender at my commencement address to St Augustine University in Mwanza, the total
enrollment at primary school level was 6,562,772. The enrollment in secondary schools was 345,441. The university enrolled a mere 24,000 students. In the same year the female student enrollment at primary school level was 48.7 percent. At secondary school level the female student enrollment was 46 percent and at university level, 39 percent. We now compare the same statistics for the year 2014. The total primary school enrollment was 8,222,667. The statistic for secondary school enrollment was 1,947,349. The enrollment in universities and colleges was 224,080 for the year 2014/2015. Let us also examine the proportion of female student enrollment for the year 2014.

At primary school level the female student enrollment was 50.8 percent. At Form 1 level the female student enrollment was 51.1 percent, at Form IV level, 47.8 percent, at Form 5 level, 32.5 percent and at Form 6 level 33.1. Female students enrolled in universities and colleges for the year 2014/2015 accounted for 35 percent of the total enrollment.

What do these statistics obtained from the National Bureau of Statistics show? In eleven years the enrollment at primary school level had jumped by 25 percent. The enrollment at secondary school level had jumped 5.64 times or by 564 percent. The student enrollment at university level was up by 9.3 times, or by almost 1000 percent. These developments are the results of educational policy reforms and strategies over the last decade. The foregoing achievements notwithstanding, gender imbalance in enrollment in higher education is a matter of concern.

My interest has been drawn to the female student enrollment at various levels and changes that have arisen, if any. The pyramid for female student enrollment percentage wise for the year 2014 was such that from Standard One to Form Four the ratio of female student enrollment is almost one half or 50 percent. The ratio drops sharply at Form Six level to 33.1 percent almost levelling at 35 percent at University level.

The gender disparity is particularly stark in the fields of science and technology, not only in student enrollment but in employment also. During my last visit to MUST, upon completion of infrastructure inspection I had an impromptu meeting with the staff. Out of 30 members present, only one was a lady!

In preparation for this lecture I sought to compare gender parity or rather gender disparity in enrollment among the ITTs. The total enrollment of female students at diploma level for the academic year 2015/2016 was 23%, 13%, and 24% at ATC, DIT, and MUST, respectively. The corresponding numbers for female enrollment at degree level were; 15%, 13%, and 12% at ATC, DIT, and MUST. When we compare the present employment of female staff of all cadres at the ITTs against total employment, we arrive at the following figures; 19%, 16%, 24%, 34%, at ATC, DIT, MUST and NM-AIST, respectively. The employment figures more or less mirror the enrollment ratios. A general conclusion is that the ratio of enrollment of female students as well as employment of female staff is extremely low taking into account the fact that according to National Bureau of Statistics, the 2012 National Census results show that 51.28% of Tanzanians are women.

The issue of gender disparity in engineering does seem to be a global one. For, according to Prof. Susan Silbey of MIT, while women make up 20% of engineering students in the US, they make up only 13% of the engineering workforce. Nearly 40% of who earn engineering
degrees either quit or never enter the profession. Writing in The Harvard Business Review Susan Silbey has observed that: *The number of women and men [in the US] are nearly equal in law and medicine, and the number of women in basic sciences is growing annually. With such a low proportion of female engineers nationally, educators and businesses need to pay more attention to how an occupation founded on a commitment to complex problem solving so consistently fails to repair its well-documented gender problem.*

MUST should actively engage in addressing the gender imbalance in science, technology, engineering and mathematics (STEM) through, among other activities, visiting secondary schools in Mbeya and engaging girls in discussions on what science and engineering are all about and the advantages of their opting for mathematics and science subjects in higher education.

Female staff members at MUST should act as role models for girl students at MUST and in secondary schools. Male engineers across the engineering spectrum and male engineering students should readily welcome female engineers and female students to this noble, but otherwise male dominated, fraternity of science and engineering.

Susan Silbey’s paper in the Harvard Review reminded me of a similar concern expressed 46 years ago! My advocacy for the mission to get more women into the engineering profession is not new. For, in 1970 a colleague of mine, Mathew Luhanga and I, wrote an article in the Tanzania Standard newspaper, now known as the Daily News, on the theme of *Women and Engineering*. Some excerpts from the article which was published on 19th July, 1970 are as follows:

“Allow us to air our views on the hitherto un debated issue of women and technology……. Traditionally it is held that women are a weak [gender] and as such they cannot undertake strenuous jobs. That women are not a weak [gender] is perhaps obvious to any individual. After all, engineering as discipline besides being diversified, is not always a matter of lifting heavy objects, turning tight nuts and other chores of the same calibre. Indeed even if it consisted of such things, we are of the opinion that our women would be just as proficient as men………

We hold the opinion that engineers are made, not born. Indeed no less an authority on the mind of the child than Jean Piaget once observed that to create [people] who are capable of doing new things, possibilities to invent and discover must be created for him during childhood………

As such the upbringing of a child assumes great importance. It is here that the role of women in [the] making [of] engineers should not be understated. In our opinion a mother who is also an engineer is best suited for the job. As John Quincy Adams once put it, “All that I am, I owe to my mother”………

Antagonists to the above arguments will agree with us that women…… can at least make as good technical teachers as men…… up until the sixth form girls take the same subjects as boys hence they stand the same chance in engineering and architecture……. We hold, and emphatically too, that engineering is not a patriarchal profession”.

Every Friday *The Tanzania Standard* published a special prize-winning letter. That week our letter won the prize, Tsh. 20, which we received and shared. We were mere high school
students then. Both of us were later to qualify as engineers and became university professors of electrical engineering.

The lack of parity at higher education level enrollment, the global nature of the challenge notwithstanding, is a matter of concern. The wise words of the educationist, philosopher and proudly referred to as the African, a native of Gold Coast, present day Ghana, the late James Emmanuel Kwegyir Aggrey are pertinent here: “The surest way to keep people down is to educate the men and neglect the women. If you educate a man you simply educate an individual, but if you educate a woman, you educate a whole nation.”

I trust the Council of the University will do whatever is necessary to address the gender imbalance in student enrollment and staff employment at MUST.

**University Staff and Student Interaction**

As a fellow member of this privileged society of educationalists and having spent two thirds of my working life as a lecturer at the University of Dar es Salaam, I take the liberty of sharing with you some views on university life and interaction between staff and students. First and foremost there must be a realisation by faculty, staff and students that the highly cherished concept of academic freedom goes with responsibilities.

In order to produce scientists and engineers capable of meeting the challenges of development, academic rigor must be maintained. Mediocrity and low standards should not feature in our vocabulary. Objective scientific inquiry has to be the cornerstone of our intellectual pursuits. We will soon start implementing postgraduate programmes. There should be no shortcuts in the attainment of graduate degrees except in accordance with the minimum levels of full-time availability, coursework and research requirements.

Let me touch on the issue of mass failure of students. Some lecturers deliberately cause mass failure in order to create terror among students and to prove that the subject concerned is tough and so learned is the lecturer! I have never subscribed to this line of reasoning. For, just like any other vocation, delivery of service is the ultimate satisfaction and pride of the provider. Infact mass failure could be an indication of the weakness of the lecturer disguised as strength. We are as providers of knowledge required to do our utmost to make sure that we are understood even by the slowest of the learners as in the case of the proverbial shepherd and his ninety nine and one sheep. This has nothing to do with standards but a high call to the vocation. In the case of mass failure, institution of an inquiry would certainly be warranted. I have not heard of any such a case at MUST, in which case I take the advice as a caution.

My advice to colleagues lecturers and professors; language is a means of communication. To communicate easily we need to be easily understood. Let us as far as possible avoid being bombastic and thus refrain from intimidating students. We have to create a conducive atmosphere for students to learn. We should refrain from turning a lecture hall into a theatre to canvass support for political causes. To the extent possible let us be available during working hours for consultation with students. I know it does not happen at MUST but
word of caution, let us not engage in sexual harassment of female (or male) students. If we abide by these simple rules, which I am sure we do, we rightfully earn the respect of peers and students alike.

To students I submit that student life is perhaps the best time of one’s lifetime. Spend it well and enjoy it. Be inquisitive even if it means getting your tutor angry. Dream, and work hard towards making sure your dream comes true. Imagine and test your imagination. Think of anything positive that you think can be done. Go ahead and do it. Work hard and earn your grades. Get involved in student politics. For that is the foundation of future leadership. Criticise the society, the government, and the university administration, but be constructive in your criticism. Always abide by the laws and regulations governing your life at the University and the society at large and by all means propose any changes or amendments to them using the necessary channels. Do not engage in riots. Do not vandalise institutional hard earned property. Get involved in cultural events and debates. Regarding sports and physical fitness remember the latin saying “Mens sana in corpore sano” (A sound mind in a sound body).

As students you will sooner rather than later be confronted with a very profound challenge: what is one’s responsibility to oneself, to one’s family, to the wider society, to Tanzania, and to Africa? It will not be long before you realise that your expectation of what is in store for you in the society may be at variance with its expectation on you. This will happen when after graduation you will endeavor to seek for employment, and you will find the employment market rather tight. Instinctively you will blame the government for lack of or scarcity of employment. Governments provide education as a service in order to create knowledge societies. It is an essential duty, a noble duty for that matter. The education that is availed to you, the authentification of which is a degree, a diploma or a certificate, is tool given to you by society, akin to an input in classical control engineering. The nation has accomplished its duties and responsibilities required of it. It expects dividends on its investment. This expectation, manifested in your contribution to society, is the output. The responsibility of the community, through government, is to evolve and implement sound micro and macro-economic policies and plans to enable you to use the education you have received and your God-given talents.

In 2015 I was invited by a group of final year students, then due to graduate from institutions of higher learning from the Dodoma area, to address them on their future prospects. Among other things, I advised them, as I advise you now, that self employment is as noble or even more noble than salaried employment. I once met an enterprising former student of mine during an event. Our conversation went as follows:

**Student:** Sir you seem to have forgotten me.

**Me:** Kindly remind me where we met.

**Student:** You taught me Control Systems Engineering during my 4 year in the Department of Electrical Engineering at the University of Dar es Salaam in the late 90s.

**Me:** Great. I am pleased to meet you. What are you doing these days?

**Student:** Sir, you remember, towards the end of each class and by way of digression, you used to offer advice to the class about what to expect in real life after University. In one such a conversation you advised us not to expect salaried employment because opportunities were becoming scarce. You advised us to consider self employment. I took your advice seriously. Upon completion of my studies I registered an electrical engineering company.
After a bumpy start, I am pleased to inform you that my firm is doing well. I now employ close to 50 people. I always thank you for the advice.

I am proud of my student and I have always quoted this example when I talk to groups of students such as those gathered here today. This is, however, one side of the story. In order to prepare for service to nation and society, students at all levels may wish to consider the following advice:

1. Follow trends in the economy by reading widely. Develop a habit of reading widely about the trend of the national, regional and global economy. In this respect Central Bank regular reports and national, regional, and international media, available online, could be very useful.

2. Be on the lookout for characteristics of the labour market. These can be obtained from the Ministry of Labour and Bureau of Statistics information, and vacancy announcements in the media, employment platforms, and the social media.

3. Develop interest in mathematics and science subjects. These subjects are a foundation to success in science, engineering, technology, medicine, business studies, economics, and social sciences.

4. Be conversant and fluent in swahili and english. Communication is key to success in business and employment. A starting point in employment is an interview. Command of the language can be an advantage. Furthermore, as the use of swahili begins to expand as more than 120 million people speak swahili, more swahili teachers are being sought in the region and afar. Besides, Swahili is now an official language of the African Union and will soon become one of the official languages of the East African Community.

5. Learn an extra language among the following; French, Spanish, Russian, and chinese (Mandarin). To succeed in employment in the regional and international job market, knowledge of a language other than swahili and english is an added advantage.

6. Be aggressive and seek employment opportunities in the region, and abroad as do Kenyans, Ugandans, Ghanaians and Nigerians. It is a rare occurrence to meet a Tanzanian working in international business or in regional or multilateral agencies. We recently met a Tanzanian employee of Emirates. Asked as to how many Tanzanians were employed in the airline, about 15 was the answer. As for Kenya, the answer was, well over 100. Emirates has more than 50,000 from 160 countries.

7. Initially do not be rigid in your choice of employment. A career path may require a transition. A transition may be a springboard to a new career, further training, or a career of your choice.

8. Form peer groups to exchange information, views, and experiences. Compared to many of us, millennials are good at embracing new thoughts, new ideas and new technologies.

9. Make use of microfinancing and venture capital opportunities available from financial institutions and government. Search for information on such opportunities.

10. Develop interest in business studies, business innovation and business startups.

A word of caution to Alumni of MUST, our students and indeed students elsewhere who are Alumni of the future, and the general populace: The advent of the web has been a boon to scholars as well as a curse, a curse in the sense of creating numerous bogus institutions masquerading as institutions of higher learning offering long distance courses, institutions
which are not accredited. Some of these institutions claim to be accredited but are recognised by fake accreditation agencies. Such institutions are known as “degree or diploma mills”. A degree or diploma mill is usually a non campus online accredited company that grants degrees or diplomas without being legally authorised to grant such a a degree or a diploma. Through such mills, a degree or diploma is granted on the basis of a curriculum vitae that merely details life experience. Some such mills also offer a degree or diploma on the basis of an essay.

A few years ago I made a search of an institution with a convincing sounding name, Commonwealth Open University. A disclaimer at the end read something like “we do not guarantee that a degree obtained from this institution will be recognized…..”. Yet many distinguished people forgot to read the fine prints and went on to obtain “doctorates”. The current advertisement from the same “institution” claims that “…Accreditation and recognition is an extremely complex issue, given that there are hundreds of accreditation bodies around the world and no course is ever going to be accredited or recognised everywhere…..” It is worthwhile to note that the “university” is established as a company in a tax haven, in the Virgin Islands!

Another such degree mill which attracted my attention some years back was Pacific Western University, a degree mill operated from Hawaii since 1988. It was also registered in California, and in Louisiana. After a Congressional probe it was found to be unaccredited as a university. It was closed in 2006. Many distinguished names, including some Tanzanians had already obtained degrees including doctoral degrees. A number of prominent people across the world had to resign their posts after it was found that they had obtained degrees from a university which was not accredited. We are advised to watch out for institutions such as Redding University, Suffield University, American University in London, American Open University, and Stanford University, which sound almost like bona fide and famous universities.

My caution regarding degree mills relates also to the proliferation of private entities including some religious institutions, which offer “honorary doctorate degrees”. Usually these are not bona fide or accredited academic institutions. Some such institutions or mills have been granting “honorary doctorates” to prominent people, especially and regrettably to Africans. A few years ago a controversy arose in Kenya and Uganda concerning a christian organisation based in the United States, the United College and Seminary conferring honorary doctorates on some very prominent people.

They exploit our weakness to accept anything that will make us add a prefix “doctor” to our names. It is an affront to the intelligence of an African. Furthermore we do not do justice to our students. They may think there is a shortcut towards earning a university degree. In many advanced countries it is customary for recipients of honorary doctorates not to be referred to as Doctor so and so. Notwithstanding The aforementioned notwithstanding linguists would remark “What is in a name?”. As I once observed: A Doctor of Philosophy degree, as is true of any degree award is but a mere tool, an input that is meant to enable the awardee to face societal challenges. The output, the reward, is the result of the use the degree for the benefit of the community and our common humanity.
The Mutuality of Science and Technology

In Professorial Inaugural Lecture that I gave twenty six years ago, entitled Energy: The Mutuality of Science and Technology, I introduced the lecture by defining science, and technology. I did not know then that one day I would be called upon to revisit the definitions. Science is the understanding of the complex interrelationship between man and the biosphere. It does encompass knowledge of biological and physical processes. Science involves the correct understanding of fundamental laws of nature. Technology, on the other hand is the application of that knowledge by mankind in the endeavor to control the environment and set the pace of development. Simply put, science can be defined as knowledge, and technology as know-how or the application of science for development.

Science and technology are inseparable. Without science, technology is not sustainable. UNESCO has aptly summarised this link thus: “Like twins, science and technology may be said to be conceived of one flesh; to be destined, from the moment of separation after first division, to develop separate identities and personalities, each from its own unique set of experiences; but to retain throughout their existence a mysterious empathy and a faculty of telepathic communication….. technological planning, without an adequate of scientific theory to direct it (naked empiricism) is simply not enough; the artificial separation of one from the other is a sure recipe for disappointment.”

Nanotechnology, a recent field of study, is a manifestation of the mutuality of science and technology. It is the study and application of extremely small things across chemistry, biology, physics, material science and engineering, made possible after the invention of the scanning tunneling microscope and the atomic force microscope. Research is being undertaken around the world in the manufacture of nanomaterials, new products and new applications. Before you dismiss work in this field as being suitable for developed countries may I remind you of the following: In 2015 a Tanzanian chemical engineer, Dr Askar Hilonga, from Nelson Mandela African Institution of Science and Technology, won the first Royal Academy of Engineering Africa Prize for Engineering Innovation. Dr Askar has developed a nanotechnology-based water filter that cleans contaminated drinking water.

MUST is a reincarnation of Mbeya Technical College and the Mbeya Institute of Technology in the form of a university. Throughout its existence since its inception emphasis has been put on the technical or technology side of training, as if in the name of our institution the s were a small letter, and the T, a capital letter. While this emphasis is expected in the short term, in the medium and long term “science” must take its rightful place at MUST in order for “technology” to have a solid grounding and backup.

Multidisciplinary Studies at the University

Traditionally engineering colleges, schools and faculties have been built on four pillars; civil engineering, mechanical engineering, chemical engineering, and electrical engineering. Over the years advancement in knowledge has led to disaggregation of these basic pillars and at times to aggregation with other disciplines. It is not uncommon these days for students to do a four year course in engineering and management, engineering and law, or engineering and business studies. It is fashionable these days for one to obtain a basic degree in engineering, and a second degree or a postgraduate diploma in business administration.
I read the following parable in the Strait Times during one of my stopovers in Singapore some years back. It was recounted by Ngiam Tong Dow, a renowned Singapore retired senior servant and contemporary of the late Lee Kuan Yew, at the National University of Singapore Economics Alumni event in December 2007: “General Bullmoose … woke up one morning and decided that he should hire a bright young man to be his aide-de-camp in business. General Bullmoose is the cartoon caricature of the mighty General Motors in real life.

Three young men were selected by the human resource department for an interview with the man himself. The first was an engineer. When asked what 1 and 1 add up to, it was no brainer for the quantitative engineer. The answer was obviously 2.

When an accountant was asked the same question, being more creative he said that 1 and 1 look like 11.

When it came to the economist the young man was at a loss to give a numerical answer. So he plucked up his courage and asked General Bullmoose, ‘Sir, what answer do you want?’. Ngiam Tong Dow’s advice was that “The nimbleness [quick-wit, shrewdness] of mind of the economist, combined with the structured logic of the engineer will, I believe, give you better odds for success in business.”

A multidisciplinary approach to higher education can be viewed from the perspective of Tanzania’s Vision 2025. In developing the characteristics of a strong and competitive economy that is envisaged, Vision 2025 defines sustainability as that growth that will be pursued while effectively reversing adverse trends in the loss and degradation of environmental resources such as forests, fisheries, fresh water, soils, biodiversity, and concerns over climate change and the accumulation of hazardous substances.

Global efforts to meet challenges posed by environmental degradation led, in the 1970s to the formation of the World Commission on Environment and Development, popularly referred to as the Brundtland Commission, named after its Chairperson Gro Harlem Brundtland of Norway. In its report ‘Our Common Future’, the term ‘sustainable development’ is defined as that “development which meets the needs of the present generation without compromising the ability of future generations to meet their own needs”. Sustainable development therefore seeks to reconcile human needs and aspirations with the capacity of the wider environment to cope with the consequences of human activities. Of immediate concern to Tanzania is the threat posed by environmental degradation and climate change. The point I wish to humbly submit is that growth, poverty reduction and the development and environmental well-being of our planet are intricately linked with engineering as a discipline and a profession. It in the light of the aforesaid therefore, that environmental studies should take a centre stage at MUST as we endeavour as a country and the world to meet challenges and opportunities posed by climate variability and climate change, development of clean energies, building a green economy, efficient resource development and use and reuse, and biodiversity protection.

For natural resources to be protected, the resources must be located and assessed. This activity is now made easier through the application of drones. The design, development and
use of drones is an area you could, as a university of science and technology, create a niche.

My considered advice to the Council of MUST and the academic leadership of the University is that we must prepare our graduates for a world which is not as compartmentalised as we would make them believe. I studied law in my second year as an undergraduate engineering student. It was then compulsory that we take a non-engineering complementary subject in order to qualify for the award of a degree in engineering. The complementary study in law, brief though it was, did hold me in good stead in my career. In the not too distant a future “science” in our name must be expanded to include relevant social sciences.

Mwalimu Nyerere and the Mbeya University of Science and Technology

Of all the universities in Tanzania, only two were founded by Mwalimu Julius Kambarage Nyerere. These are; the University of Dar es Salaam, and the Mbeya University of Science and Technology. This information should not come as a surprise to you. By way of history, upon his retirement as President of Tanzania, Mwalimu remained as Chairman of Chama cha Mapinduzi(CCM). During one of his working tours he had the opportunity to visit Mbeya. On 31 May 1987 he visited the then Mbeya Technical College. After inspecting the College he was very impressed. He remarked to those present that in view of the importance of science and technology to the development of Tanzania he would wish that the government develop the college so that it eventually becomes Tanzania’s university of science and technology. MUST is the result of Mwalimu’s dream.

As we hold our heads high for being associated with the name of one of the greatest philosophers of our time, and founder of our nation, Mwalimu, we should be humbled by the responsibility to meet his aspirations and to live in accordance with his teachings and his guidance. He was a firm believer on the need for a university to be relevant to society and to the country while recognising the international character of knowledge.

MUST has to develop a brand rooted in its relevance to the community it serves and to the country it belongs. While stressing the importance of relevance in the university, during his seminal address to the University of Dar es Salaam community on the occasion of the inauguration of the university on 29 August 1970, Mwalimu Julius Kambarage Nyerere, the first Chancellor of the University had this caution to make:” Thus we would be inviting our own destruction if we gave too narrow a definition to the word ‘relevant’ when using it in relation to our university studies. Knowledge is international and interrelated. We need to know and understand as much as we possibly can; we need to learn from the past and the present of all parts of the globe. All knowledge is relevant to us, even if we consider ourselves only as Tanzania citizens and ignore our existence as human beings. It is only by starting from that basis that we can avoid blundering into national disaster through deliberate blindness”.

The issue of whether education is a right and that the government has to give on demand has been debated over decades since Mwalimu. It becomes a right when the Government can afford it, and it becomes a privilege when the it can be accorded to a few. Such is the
case with higher education. It is a privilege in the sense that only a select few in the education pyramid can reach the top because higher education is expensive. Limits are therefore placed in accordance with passes and the availability of space, infrastructure, staff and learning facilities. Our worth as the educated class will continue to be measured by our contribution to society and to Tanzania. Mwalimu Nyerere aptly summarised our responsibilities as an educated class thus: “Those who receive this privilege, therefore, have a duty to repay the sacrifice which others have made. They are like a man who has been given all the food available in a starving village in order that he might have the strength to bring food back from a distant village……” The ‘duty to repay’ may be construed by the present generation as the duty to repay educational loans! A gentle reminder to you concerns the fungibility of loans. A fraction of development expenditure has had to be foregone for the provision of educational loans. While loans should be repaid, the duty to repay referred to here is service to the nation. You could argue that after all Mwalimu was a socialist. The following equally powerful words “Ask not what the country can do for you but what you can do for your country.” were spoken by John Fitzgerald Kennedy as part of his inaugural address as President of the United States of America, leader of the capitalist world.

Mwalimu hated corruption, arrogance, and indolence. He was God-fearing, humble but resolute. He was an avid reader, writer, listener, and a brilliant scholar. Mwalimu was a teacher and philosopher. I have yet to meet a person as punctual as Mwalimu was. He was a lover of plants and fauna. The establishment of a botanical garden that I have proposed will be a tribute to Mwalimu’s interest in botany. Being associated with his name, therefore, requires us to emulate by example, his teachings and the life he led, both as individuals and as an institution. What Mwalimu would have required of us can be summarised thus: Service Before Self.

Some Concluding Remarks

I started my lecture by the submission that as Chancellor of the University my role is titular and honorary. The Charter of the University assigns the responsibility of oversight to the Council. The founding Council which has ably handled the transition from MIST to MUST has been under the leadership of Prof. Penina Mlama. I would like, on behalf of the University community to thank the Council for a job well done. May I add that we did not expect anything less from the Council. The day to day running of the University is vested in the Vice Chancellor, assisted by Deputy Vice Chancellors, the Senate, Heads of Schools and Colleges and the entire administrative and academic staff. I thank you all.

I have used the opportunity provided to me liberally, by adding my reflections and perspectives on the role of MUST in contributing to the attainment of the goals of Vision 2025 and beyond 2025. To underscore the importance of MUST in the creation of a knowledge and learned society, I have relied on, as my canons, the writings of three philosophers and educationalists; Imam Ali bin abi Talib, nephew of Prophet Mohammed(Peace be Upon Him); James Emmanuel Kwegyir Aggrey of Achimota College, Ghana; and our Father of the Nation, Mwalimu Julius Kambarage Nyerere.
I have made some suggestions on how you could exploit the virtues and advantages of universalism of knowledge through cooperation internally and externally while remaining relevant to your immediate impact area. I have underscored the need for MUST to develop a strong science base if it has to emerge with a strong engineering output. I have also stressed the need for interdisciplinary studies in the knowledge that the society does not exist in a compartmentalised form. Science is an embodiment of both basic sciences and social sciences. Furthermore, building a strong foundation in environmental studies and the development of a botanical garden could be important this regard. The model of the robot in the lab must be developed into a working prototype. The rudimentary motor vehicle MUST should be the basis of continuous improvement into an electric vehicle and ultimately a driverless vehicle. Nanotechnology has to take centre stage in research and development. We must peer into the future, 100 years from now as we strive to make MUST a hub of knowledge, intellectualism, innovation and service to society.

I have also reminded you that MUST is a creation of Mwalimu Nyerere. We must strive to be true to his ideals and ideas. Importantly the output of MUST must resemble a University steeped in a national ethos of freedom, respect for rights of an individual, hard work, discipline, confidence, respect of the rule of law and good governance in all its manifestations. I urge staff, students, and alumni of this University remember that “...no good tree bears bad fruit, nor again does a bad tree bear good fruit, for each tree is known by its own fruit.”(Luke 6:43-44).

Our first and paramount responsibility is teaching. To be good teachers we must be up to date with knowledge. To be up to date we must do research. To do research we need institutional support. That support is partly through postgraduate programmes. We must continue to upgrade our academic and administrative staff.

As a centre of higher learning, MUST has to create an atmosphere conducive to interaction between the University community and scholars, eminent people and persons distinguished in science, technology and their interface with society. Only then can we measure our understanding of the the world compared to the actual world, and the world as perceived by others. This is the essence of the spread and increase, upon use, of knowledge, as envisaged by Imam Ali bin abi Talib in his treatise on knowledge. This lecture could therefore be considered as the first of the Chancellor’s Lecture Series on Science, Technology and Society. I urge the Council to make this exercise an annual event. I would be glad, after receiving advice from the Chairman of Council and the Vice Chancellor, to invite guest speakers to this series of lectures.

I started my journey to Mbeya University of Science and Technology from the humble begins of Majengo Area in Mbeya where I grew up and Majengo Primary School where I was enrolled in November 1956 and began my studies in January 1957. It has been a long 10 kilometre journey that has taken me 60 years to date, a very worthwhile journey to undertake.

A few weeks ago, as I was preparing for this lecture, as an avid follower of global events, my attention was drawn to the following developments: On 22 June 2016 India successfully launched 20 satellites on a single rocket, the Polar Satellite Launch Vehicle-C34. The payload included satellites from India, Germany, Indonesia, and the United States. The
NASA space probe *Juno* successfully entered the Jupiter orbit on 4 July 2016. For 24 months, *Juno* will seek to determine Jupiter’s formation and evolution and thus add knowledge to the origin of the solar system including our earth. On 16 October 2016 China launched into space the *Shenzhou-11* craft to dock with the *Tiangong-2* space laboratory for 30 days. The astronauts performed experiments on computers, propulsion systems, and agricultural trials including the growing of cucumbers in space! among others. As for Africa I followed with interest an event in Madagascar. Once in seven years a ceremony of unearthing and reburying the dead, *famadihana*, is performed as an act of maintaining links with ancestors and allowing the dead to experience the happiness of life.

I could only summarise the situation thus: The higher others go to explore and exploit space to advance knowledge and technology, the deeper we go under the earth to reconnect with our ancestors! We too can still reconnect with our ancestors as we seek to explore space. This is the challenge before MUST and other ITTs, and the nation. As I conclude the lecture that I deliver to people we are grooming to take us to space, I recall a tale we were taught in school, the tale that was told by a Ghanaian, one of the pioneers of education in Africa, the African, James Emmanuel Kwegyir Aggrey(1875 -1927), the parable of the eagle:

*One day a man went hunting in the forest. He was looking for any interesting bird he could find for his collection. He caught a young eagle which he brought home. He placed the bird in his farmyard and fed it the same food as his chicks, ducks and turkeys, in spite of the fact that it was an eagle which is the king of birds. Five years later, a biologist came to see him. They went to the yard together. The biologist told the man:*  
*This is an eagle, not a chicken!*  
*Yes, replied the owner, but I have trained it to be a chicken. It has been fed and raised like a chicken. Therefore it is no longer an eagle, even though its wingspan is fifteen feet.*  
*No, no, replied the biologist, it is an eagle. It has all the characteristics of an eagle, and I will prove to you that it is an eagle. I will make it fly high up to the heavens.*  
*He then took the eagle in his hands and addressed it with great intensity in the following terms:*  
*You are an eagle, not a chicken. Fly away! He then threw it into the air.*  
*The poor eagle fell back to earth just like a chicken would do, therupon its owner said:*  
*There, I told you. Now you can see that it is no longer an eagle. It is now a chicken and it will never fly.*  
*But the biologist did not give up. The next day he returned and the scene was repeated. The eagle again fell back to earth like a chicken. On the third day he took the eagle in his hands, turning it to face the sun and uttering the following words:*  
*Eagle, stretch your wings and fly. You are not a farmyard bird but the king of the skies.*  
*The eagle looked around, gazed steadily at the sun and, at the thought of the new life which might await it, stretched out its wings, uttered the cry of an eagle and flew away higher and higher into the sky, never to return to the farmyard again.*

I submit that we at MUST resemble this eagle. We are free at last, looking towards the limitless space. Let us fasten our belts as we prepare for a flight to the heights of science and technology. The spirits of our ancestors, which reside in the surrounding majestic Southern Highlands of Tanzania, summon us to declare never to fall, and never to fail our motherland Tanzania, and Africa.
I thank you most sincerely for your indulgence.