



RESEARCH ARTICLE

OPEN ACCESS

## HIGHER EDUCATION AND INDUSTRIALIZATION IN TANZANIA

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### ARTICLE INFO

#### Article History:

Received 17<sup>th</sup> August, 2020

Received in revised form

29<sup>th</sup> September, 2020

Accepted 02<sup>nd</sup> October, 2020

Published online 30<sup>th</sup> November, 2020

#### Key Words:

Higher education, Labour market, Skills mismatch, Industrialization, Employment.

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### ABSTRACT

This study was conducted with its main thrust being the unravelling of the elements of mismatch between higher education and the needs of industries. Both quantitative and qualitative methods were used to collect data from higher learning institutions, graduates, employers and government agencies. The mismatches uncovered included the insufficiency of soft skills in the labour market that are highly needed by industry: the ability of graduates to analyze situations and propose solutions, leadership and innovation and graduates' ability to take responsibility of own actions and inactions. The foundations of these mismatches were unearthed to include the following three subcomponents: poor integration of relevant stakeholders; inadequate funding and industrial challenges. The study further unraveled that the mismatches between higher education and skills need of industries have three major effects on the Tanzanian economy: labour market, productivity, and development effects. The study recommended the need to enhance both vertical and horizontal integrations among stakeholders in the higher education sector; boost up funding for higher education; mainstream entrepreneurship course; create enabling environment for the private sector and industry to thrive; and create an integrated platform for dialogue on national provisions for higher education and the needs of the Tanzanian economy.

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Citation: William George. 2020. "Higher education and industrialization in Tanzania", *International Journal of Development Research*, 10, (11), 42029-42034.

### INTRODUCTION

Accelerated industrialization is one of the priorities of Tanzania in order to boost the welfare of her citizenry as well as economic development. To achieve these goals several factors including, building competent human resource base are required (URT, 2016). This therefore, requires that higher education provides graduates with job-relevant skills to meet the demands of firms and the economy as a whole (Palma, 2011; Dasmani, 2013). As a result government agencies, ministries and the private sector in the country are expressing interests on the need to make higher learning institutions more relevant to the holistic development of the country. For instance, in 2016 Association of Tanzania Employers (ATE) clamours for suitably qualified graduates to increase industrial productivity. Even though the mismatch phenomenon between the skills possessed by graduates and those needed by firms has been widely acknowledged and reported in Tanzania, comprehensive and empirical assessments exploring its nature and extent as well as the underpinning factors of the mismatch are scarce. King *et al* (2014) (cited in World Bank, 2008) noted that in Tanzania there has been virtually no empirical research investigating how effectively the skills acquired

by graduates are being translated into the labour market. Thus, policy making is not rooted in evidence-based arguments to meet the objectives of the training schemes of the graduates. Atta-Quayson (2013) for instance has argued that the educational sector operates on the assumption of an educational system with a structure and content which reflect the socio-economic, environment and manpower needs of the country even when such needs have not been empirically assessed. On the backdrop of these outlined needs of policy makers coupled with the imperativeness of the subject matter, this study seeks to unravel the elements of mismatch between higher education and the needs of industry in Tanzania, and the factors underpinning the mismatches. By unearthing the key issues surrounding the disconnect between skills of graduates and the needs of industry, this study contributes to improving the relevance of higher education, both in terms of its provision of job-relevant skills and its alignment with the needs of the labour market. The major problem which this study investigated was the prevalence and extent of mismatch between the supply of and demand of skills among university graduates in the Tanzania labor market. This becomes necessary and needs urgent attention because of the great challenge, it poses on the market relevance of university

education in the country, and for the magnitude of returns to public investment in university education. The research questions guide this study are: what are the skills demanded by the employers of labour from university graduates?, what is the level of skills that Tanzanian university graduates display in their place of work? and to what extent is the mismatch between the skills acquired by university graduates and the demand of their jobs?

## METHODOLOGY

Qualitative and quantitative methodologies were employed for data collection and analysis for this paper: in-depth interviews, documentary reviews, structured questionnaires. Purposive and simple random sampling techniques were respectively used to select the location and respondents. A total of 421 participants were randomly selected for the study including employers and recently employed university graduates, representatives from relevant government agencies governing higher education delivery in Tanzania and Ministries. Departments of higher learning institutions were purposively selected based on the commonality of programmes offered. Also, 150 firms (both public and private) were contacted randomly including manufacturing firms, service firms, construction and engineering firms, extractive firms, agricultural and agro-processing firms. The validity of the instrument was guaranteed by subjecting it to thorough scrutiny by experts in this field.

$$\text{Cronbach's alpha} = \left[ \frac{n}{n-1} \right] \left[ \frac{SD^2 - \sum \text{Variance}}{SD^2} \right]$$

Where:

n = Number of items on the test

SD = The Standard Deviation for the set of test scores, and  
 $\sum$ Variance = Summation of the variances of the scores for each of individual item on the test. A

Cronbach's Alpha of above 0.7 will show that the tool is reliable. The higher the reliability coefficient, the higher the reliability of the instrument (Amin, 2005).

The reliability coefficient of the instrument was 0.83 which confirms that the instrument is reliable. Data collected were analyzed using descriptive (frequency counts, percentages, means and standard deviations).

## RESULTS AND DISCUSSION

### RESULTS

Research Question 1: What are the skills demanded by the employers of labor from university graduates?

From Table 1, 10 out of the listed group of skills were considered critical by the employers of labor. These include analytical skills (mean = 3.61, SD = 0.55) which was deemed as very critical and entrepreneurial skills (mean = 3.37, SD = 0.69), communication skills (mean = 2.66, SD = 0.90),

**Table 1. Skills Demanded of University Graduates by Employers**

Skills	Very critical	Critical	Less critical	Not critical	Mean	SD
	4	3	2	1		
Analytical	268 (63.7)	141 (33.5)	11 (2.6)	1 (0.2)	3.61	0.55
Enterprenurial	201 (47.7)	182 (43.2)	32 (7.6)	6 (1.4)	3.37	0.69
Critical thinking	73 (17.3)	111 (26.4)	68 (16.2)	169 (40.1)	2.21	1.15
Communication	104 (24.7)	91 (21.6)	206 (48.9)	20 (4.8)	2.66	0.90
Decisimaking	135 (32.1)	107 (25.4)	165 (39.2)	14 (3.3)	2.86	1.91
Information Technology	163 (38.7)	147 (34.9)	101 (24.0)	10 (2.4)	3.09	0.85
Interpersonal	123 (29.2)	250 (59.4)	43 (10.2)	5 (1.2)	3.16	0.64
Problem solving	128 (30.4)	240 (57.0)	51 (12.1)	2 (0.5)	3.17	0.64
Self-directed learning	177 (42.0)	151 (35.9)	87 (20.7)	6 (1.5)	3.18	0.81
Technical	124 (29.5)	209 (49.6)	81 (19.2)	7 (1.7)	3.07	0.74
Numeracy	127 (30.2)	165 (39.2)	112 (26.6)	17 (4.0)	2.95	0.85
Weighted average 3.03						

Notes:  $\bar{X} \geq 2.50$  is critical, N = 421, Figures in parentheses are percentage of participants

**Table 2. Level of Skills Displayed by Tanzanian University Graduates in the Work Place**

Skills	Verrygood	Good	Average	Poor	Mean	SD
	4	3	2	1		
Analytical	4 (1.0)	96 (22.8)	166 (39.4)	155 (36.8)	1.88	0.79
Enterprenurial	4 (1.0)	63 (15.0)	42 (10.0)	312 (74.1)	1.43	0.78
Critical thinking	3 (0.7)	44 (10.5)	60 (14.3)	314 (74.6)	1.37	0.69
Communication	2 (0.5)	24 (5.7)	73 (17.3)	322 (76.5)	1.30	0.59
Decisimaking	2 (0.5)	50 (11.9)	50 (11.9)	319 (75.8)	1.37	0.71
Information Technology	6 (1.4)	35 (8.3)	56 (13.3)	324 (77.0)	1.34	0.70
Interpersonal	3 (0.7)	51 (12.1)	53 (12.6)	314 (74.6)	1.39	0.72
Problem solving	65 (15.4)	149 (35.4)	123 (29.2)	84 (20.0)	2.46	0.98
Self-directed learning	3 (0.7)	52 (12.4)	197 (46.8)	169 (40.1)	1.74	0.70
Technical	5 (1.2)	60 (14.3)	76 (18.1)	280 (66.5)	1.50	0.78
Numeracy	11 (2.6)	59 (14.0)	65 (15.4)	286 (67.9)	1.52	0.85
Weighted average 1.57						

Notes:  $\bar{X} \geq 3.00$  is good, N = 421, Figures in parentheses are percentage of participants

The Cronbach method was used to test the reliability of the instrument. The Chronbach's alpha was used to correlate the scores of the responses. The formula for Cronbach's Alpha to be used is follows:

decision-making skills (mean = 2.86, SD = 0.91), IT skills (mean = 3.09, SD = 0.85) and interpersonal skills (mean = 3.16, SD = 0.64) were also critically required. Others include problem solving (mean = 3.17, SD = 0.64), self-directed learning skills (mean = 3.18, SD = 0.81), technical skills

(mean = 3.07, SD = 0.74) and numeracy skills (mean = 2.95, SD = 0.85). The weighted average of 3.03 for all the skills listed indicates that all the listed skills (except for critical thinking skill) were in critical demand by the employers of labor.

Research Question 2: What is the level of skills that the Tanzanian university graduates display in the work place?

Table 2 showed that the display of skills by university graduates was significantly low, and they were scored low, in fact poor and in every skill listed. For analytical skills, graduates displayed a mean score of 1.88 (SD = 0.79), entrepreneurial skills (mean = 1.43, SD = 0.78), critical thinking skills (mean = 1.37, SD = 0.69) communication skills (mean = 1.30, SD = 0.59), IT skills (mean = 1.34, SD = 0.70), interpersonal skills (mean = 1.39, SD = 0.72), decision making skills (mean = 1.37, SD = 0.71), and the mean scores were all low. Other skills which graduates displayed very low included self-directed learning (mean = 1.74, SD = 0.69), technical skills (mean = 1.50, SD = 0.78) and numeracy skills (mean = 1.52, SD = 0.85).

skills under review-analytical, entrepreneurial, critical thinking, communication, decision-making, IT, interpersonal, problem-solving and self-directed learning skills. The mean values for the skills, except for critical thinking, were high revealing that those skills were needed critically, and that critical thinking skill was needed only to a lesser extent compared to others. Analytical and entrepreneurial skills appeared to be the most sought after in combination with the respective academic skills. Reasons for the preference may vary from one individual or organization to another, but essentially, businesses will grow and be more profitable, if workers are analytical, that is, skilled in using methods help in examining intellectual or substantial things carefully, and separating them into their elemental parts or basic principles. The high weighted average of 3.03 implies that the labor market is not asking for a "Perfect", "Excellent" or "Very good" score, but 3.03 out of 4 (or 75.75%) which translates to a "Good" score. This is, of course, achievable with a little more concerted demand-directed effort. This high weighted average of 3.03 also suggests that the quality of skills demanded is high in the labor market.

**Table 3. The Extent of Mismatch Between the Skills Acquired by University Graduates and the Demands of Their Job**

Skills	1= Mean Skills Demand (SD)	2= Mean Skill Supply (SS)	3= Supply relative to demand (ASS): $\left(\frac{SS}{4}\right) SD$	4=Extent of mismatch in % $\left(\frac{SD - ASS}{SD}\right) 100$	Rank
Analytical	3.61	1.88	1.71	52.6	10
Enterprenurial	3.37	1.43	1.20	64.3	6
Critical thinking	2.21	1.37	0.76	65.6	4
Communication	2.66	1.30	0.86	67.7	1
Decisinmaking	2.86	1.37	0.98	65.7	3
Information Technology	3.09	1.34	1.04	66.3	2
Interpersonal	3.16	1.39	1.10	65.1	5
Problem solving	3.17	2.46	1.95	38.4	11
Self-directedlearning	3.18	1.74	1.38	56.6	9
Technical	3.07	1.50	1.15	62.2	7
Numeracy	2.95	1.52	1.12	62.0	8
Extent of mismatch = 60.6%					

The only skill which graduates displayed relatively highly is problem-solving skills (mean = 2.46; SD = 0.98). On the whole, the weighted average of 1.57 is significantly low and generally poor indicating a general poor level of performance of recent university graduates in the different organizations.

Research Question 3: To what extent is the mismatch between the skill acquired by university graduates and the demands of their jobs?

From Table 3, the extent of the mismatch of skills under review was generally high except for problem-solving skills. The least supplied skill relative to its demand was that of communication (67.7%), which was the highest compared to other skills required by the employers. This is followed by IT (66.3%), decision-making (65.7%), critical thinking (65.6%), interpersonal (65.1%) entrepreneurial (64.3%), technical (62.2.9%), numeracy (62.0%), self-directed (56.6%), analytical (52.6%) and problem-solving (38.4%). The extent of mismatch of skills under review was 60.59% which was considered high being more than half of skill requirement of the employers.

## DISCUSSION

**Skills demanded by employers:** Answers to RQ1 (research question 1) indicated that employers demanded for all the

In other words, there is a high demand for ready-made or ready-to-perform graduates in whom these skills are found. This is not only applicable to Tanzania. All over the world, several theoretical and empirical studies (Boateng and Ofori-Sarpong, 2002; Frogner, 2002) have identified increased demand for generic skills, such as communication, problem-solving, analytical, social and good interpersonal skills, and the ability to use IT equipment. The difference, however, is in the ranking of the demand for these different skills in different countries. For example, Frogner (2002) reported that in the UK, the most sought skill was communication, followed by team-working and other technical/practical skills. Basic computing and advanced IT or software only came in at 7th and 8th places respectively, both being sought less than half as often as communications skills.

**Skills displayed by graduates at their work place:** From the results obtained for RQ2, recent graduates displayed inadequately, the skills listed. The weighted average of 1.57 revealed that the general performance of the graduates in terms of skill supply is not high enough, in fact, poor, even the low-rated skill by the employer, critical thinking, was poorly supplied by the graduates. Although not high enough, the skill that employers believed was relatively highly supplied and was that of problem-solving, which was still below average. It is surprising that with the current awareness in IT on the

campuses and its use by students in writing their take-home assignments, term papers, seminars and dissertations, graduates still displayed this skill and other related ones, such as analytical, self-directed learning and numeracy skills, inadequately. Students must, therefore, be more involved in IT and be better equipped with its application in their respective chosen career. On the other hand, problem-solving skill, which was displayed to a fair extent, is likely to have been acquired from experiences of students on their research projects and seminars. A serious deficiency in university graduates as found in this study was the poor display of entrepreneurial skills. Entrepreneurial skill is the job-creation skill and the ability to arrange business deals and take risks in order to make a profit. The adequate display of which would reduce the rate of unemployment and graduates would be able to start businesses and make profit from them.

### 1.1.1 Skills mismatch

Answers for RQ3 were obtained from those already provided for RQ1 and RQ2. From this result, it is confirmed empirically that there is skills mismatch. Graduate skills demand was found to be higher than supply. This finding agrees with the earlier speculations on the subject by Dabalen et al. (2000). But more importantly, the extent of this mismatch is alarming. Out of the 11 skills investigated, the magnitudes of mismatch for 10 were above 50%, while that for only problem-solving skill was below 40%, indicating that it was the only one adequately supplied. The overall extent of mismatch of 60.59% shows that far below half the quality of skills demanded were actually supplied. The areas of major weaknesses in the supply of skills by the graduates were entrepreneurial skills, IT, interpersonal relationships, decision-making, technical, communication, numeracy, analytical, self-directed and critical thinking skills.

### 1.1.2 Foundations of Mismatch between higher education's output and skills needed by industry in Tanzania

#### a) Poor integration of relevant stakeholders

Integration and effective cooperation of relevant stakeholders in higher education is a necessary condition for building quality and skillful workforce for industrial productivity and economic development. Findings from the study, however, unveiled issues which point to the fact that poor integration exist among key stakeholders in the higher education sector. Key issues that were discussed during the study are: weak interaction and communication between industry and higher learning institutions; ineffective cooperation and inept attitude of industry's players.

Out of the 35 departments indicated that they do interact with firms, only 17.1 percent, 11.4 percent and 2.9 percent respectively interacted with firms on issues of joint monitoring of programmes, funding of programmes and business incubation. As much as 45 percent (18 out of 40) departments did not involve firms in the development of their programmes, with 94.4 percent (17 out of 18) noting that firms do not honour invitations to participate in programmes' development. Similarly, majority (15 out of 25) of firms that took part in this study indicated that they did not participate in the development of courses at higher learning institutions,

attributing their non-involvement to two major factors: higher learning institutions not seeking their inputs; and the lack of channel of communication between firms and higher learning institutions.

#### b) Inadequate funding

The shortfall between the actual expenditure needed to finance quality higher education and the expected revenue from the funding sources over the past five years continues to widen and, is one of the fundamental factors underpinning the mismatches. According to the NACTE (2011), private sector has been the major source of funding for public higher education over the period under consideration, followed by Internally Generated Funds (IGF), comprising mainly of fees, consultancies and donor supports. In an in-depth interview, some senior members of the Ministry of education made the following strong observations on the funding pattern of higher education:

“Low budgetary allocation to the higher education in the country has been our major challenge...the mandate of polytechnics is demanding, to train middle level technical and professionally skilled human resources to feed industry but allocation of funds is inadequate. Also ...lack of facilities and lack of innovative funding of science. If it were some countries, once you say you want more science, you put in a mechanism to fund the sciences; they don't just say it without funding it, and it becomes a mere proposal” (A senior member of MOE, 2016).

#### c) Industrial challenges

The performance of the industrial sector influences the nature of growth and the level of Employment/unemployment in an economy. In countries such as Taiwan and Korea where industry has in recent times taken a centre stage in development, the phenomenon of graduate unemployment seems to be minimal and economic growth is on the increase. In Tanzania, even though the National Strategy for Growth and Reduction of Poverty (NSGRP/MKUKUTA) and the Tanzania Five Year Development Plan (NFYDP II) of 2016/17 to 2020/21 have the private sector and industry as the engine of growth, the industrial sector currently has two major challenges impeding its ability to contribute effectively to economic growth and curb the problem of graduate unemployment.

The first challenge is the lack of capacity of the industrial sector to expand and employ trained graduates. The study identified high cost of production and lack of adequate productive resources to be the leading factors accounting for a decline in industrial growth, hence its capacity to employ graduates in the labour market. Respondents at ATE and firms opined on the capacity of firms to absorb graduates as follows:

“The manufacturing firms are not there. How many are they? The firms are not there. If we cannot get firms, especially for industrial attachments, what is the student going to learn? If you train me in mechanical engineering and I get out, where am I going to work? It's not that easy...the national economy itself is becoming more and more service based so people will be attracted there. There are few manufacturing firms... even those that are there, they are not even manufacturing...” (A senior member of

ATE, 2016). "The declining of industries means numbers that can be absorbed are reducing and mass production means graduates looking for jobs are increasing. So the issue is a problem of declining capacities of industries as well as lack of basic necessary skills possessed by graduates that are in demand with industries" (A senior member of ATE, 2016). The second major challenge confronting the industrial sector is the lack of enabling environment for expansion. In an interview with the ATE, a senior member confirmed the nature of the challenge in the following reflection:

"...lack of support or enabling environment for private sector to expand and establish new businesses is limiting its ability to employ more graduates. The government used to be the largest employer in the Tanzanian economy, but now it's the private sector. And because we now have a liberalized economy we need to support the private sector to expand especially those in businesses to grow. They can only employ more when they expand. There should be support to start-up businesses so that they can also be sustainable, grow and employ more graduates... So the private sector is not growing because of lack of support. It is not growing because politicians don't see them as partners, they see them as competitors..." (A senior member ATE, 2016).

**Effects of mismatches on the Tanzanian economy:** The mismatches between higher education and the needs of firms have three major effects on the Tanzanian economy: labour market, productivity, and development effect:

**Labour market effect:** The labour market effect is manifested in the growing unemployment for young graduates. There are a significant number of graduates that are unemployed after completing various tertiary institutions in the country. This is partly because firms consider them as not possessing job-relevant skills and partly due to the low capacity of firms to absorb them. Aside the teeming masses of unemployed graduates, there is another group who are doing jobs such as shop keeping, taxi driving and so on, that are below the skills and trainings acquired from the higher learning institutions.

**Productivity effect:** The mismatch between skills possessed by graduates and what is needed by industries compel them to spend considerable amount of resources in retraining newly recruited graduates. This results in high cost of production as well as low industrial productivity and profitability. In some cases, particularly in the extractive firms, highly skilled jobs have to be given to expatriates since such skills are lacking in the domestic labour market.

**Development effect:** The development effect of the skills mismatch is manifested in the form of low industrial growth and contribution to the gross domestic product of the country. According to ATE, firms are collapsing and existing ones also lack the capacity to grow. The high unemployment resulting from graduates' skills mismatch and capacity of industry to absorb graduates from higher learning institutions is leading to high dependency rate and increase in social vices in the economy. These negative effects thwart the socio-economic development processes of the country.

## Conclusion and Recommendations

**Conclusion:** This study was carried out to assess the incidence and extent of skills mismatch among employed university graduates in Tanzania labor market. The findings from the

study showed that there were gross inadequacies in the supply of all the skills (except problem-solving skill), as needed by the employers and by extension the labor market. A skill mismatch of 60.6% was identified among recent graduates. Communication, IT, decision-making, critical thinking, interpersonal relationship, and entrepreneurial, technical and numeracy skills were found to be critically deficient.

**Recommendations:** Based on these findings, the following recommendations are put forward to ensure that higher education and firms reinforce one other for industrial development in Tanzania:

- a. Enhance both vertical and horizontal integrations among stakeholders in higher education sector.

There must be effective integration and inter agency cooperation between stakeholders in the higher education sector. Communication and feedback mechanisms must be well developed and instituted among all key stakeholders to promote access to and flow of information among the stakeholders. This will enhance well-informed decision making in the sector. For instance, an effective integration among stakeholders can enable ATE provide information on their skills needs and expectations of graduates, as well as their concerns and grievances to the governing bodies and higher learning institutions and vice versa. Ultimately, this integration will inform the development and accreditation of programmes, and the mode of instructions in the tertiary institutions, thereby resulting in the production of the caliber of graduates needed to steer the industrial and other development processes of the country.

- b. Boost up funding for tertiary education

With the continuous widening gap between expected revenue from funding sources and actual expenditure needed to fund quality higher education, there is the need to boost the funding of higher education through innovative means. First and foremost, government must be more committed to funding existing public higher learning institutions by way of supporting the recruitment of more qualified human resource personnel and infrastructure development rather than the creation of more higher learning institutions. In doing that, infrastructure at these establishments will be improved to contain more students, while students-lecturer ratio will also be enhanced for quality training. Secondly, public higher learning institutions must be given more autonomy to commercialize knowledge and own business enterprises in order to promote a strong linkage and partnership with industry. For instance, a knowledge generated through higher institution-industry linkage will be protected by patent and copy right laws and that will enable both universities and industry to generate revenue out of knowledge generated through research, besides the benefits of students graduating with competent skills relevant to industry.

- c. Create a greater enabling environment for the private sector and industry to thrive

A critical challenge underpinning graduates unemployment phenomenon in Tanzania has been the lack of capacity of firms to absorb all graduates from tertiary institutions. Findings in this study revealed how high cost of production and weak legislative environment are serving as banes to industries to

expand. It is therefore recommended that government creates a more conducive environment for the private sector including tax rebates, efficient legislative instrument, etc. in order to boost the expansion of firms, thereby enhancing their capacity to absorb graduates from higher institutions.

- d. Mainstream entrepreneurship course into all departments programmes

Some of the critical skills mismatches (leadership and innovation, and graduates' ability to take responsibility of own actions and inactions) unveiled in this study border heavily on the minimal involvement of entrepreneurship training in Tanzania's tertiary education system. At a time when entrepreneurship is advocated globally for development, it is recommended herein that all higher institutions should mandate all departments to introduce entrepreneurship as a compulsory course for students in their final year. This will help develop graduates' entrepreneurship skills to foster the initiation and proper management of micro enterprises by graduates who are unable to secure employment with the public or private sectors after completing their courses.

- e. Create an integrated platform for dialogue on national provisions for high education and the needs of the Tanzanian economy

Some of the critical issues that surfaced in this study include weak linkages between programmes/courses and the needs of industry; among others. To resolve these challenges and improve upon the effectiveness of higher education, there is the need for the creation of a non-political as well as a non-partisan platform for key stakeholders to dialogue on the higher education, develop performance indicators and benchmarks. These performance indicators and benchmarks must be assessed annually, to ascertain progress and effectiveness of the higher education sector in building the skilled labour force needed for industrial and economic development.

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