Redefining Employability Skills in the Fourth Industrial Revolution: A Comparative Analysis with Nyerere's Second and Third Industrial Revolutions

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ABSTRACT

The late Mwalimu Julius Nyerere is considered as one of the pioneers of the African revolution, his struggles entailed the economic change that embodied the employability transformations in order to increase production and enhance growth. However, changes in the industrial revolution as the result of technological changes resulted in the shift of employment patterns across generations from the Nyerere generation which represent the second and third industrial generation to the new fourth industrial revolution (4IR) which is characterized by high technological innovations. These innovations have led to the change in the government policies in order to equip youths especially university graduates with relevant skills to cope with the speed of 4IR. Despite the efforts undertaken by governments to address and enhance soft and technical skills development most graduates have been fearing of losing chances before these technological innovations, therefore the current study explores youth perception on the employability status in the face of 4IR in Tanzania using probit model from 100 students at Mzumbe university who were randomly sampled. The results reveal that there is a positive relationship between life/soft skills, technological/hard skills, awareness of 4IR, preparation for self-employment, and graduate's employability in 4IR, shown by positive coefficients of 0.514, 0.337, 0.976 and 1.038 respectively. Life/soft skills, technological/hard skills, awareness of industry 4.0, and preparation for self-employment were found significant at a 5% significance level with p-values of 0.000, 0.034, 0.033, and 0.029 respectively. Simply the findings suggest that a graduate (finalist) who is aware of industry 4.0, is prepared for self-employment, and have soft/life skills and technological/hard skills. Therefore, the study recommends that higher learning institutions and government authorities governing higher learning should be investment in the soft skills among youths, and enhance entrepreneurial course that constitutes innovation and creativity components in order to enable graduates and youths be able to cope with the speed of the technological and industrial demands for employability.

Keywords: *Industry 4.0, Lifelong Skills, Self-Employment, Technological/Hard Skills*

I. INTRODUCTION

The economists define industry as the collection of firms producing the same products (Zafar et al. 2021; Kitole and Utouh, 2023). Narrowly, the industry is similar to the product value chains given that there are many actors producing the same product and with that production system some social transformations happened due to innovations targeting transformed customers' utility and demand of the products in their baskets. Social transformation passes through stages triggering technological development and improvement leading to defining stages of industrial revolutions (Philbeck & Davis, 2019; Kitole and Sesabo, 2024). The first industrial revolution began in England around 1750 to 1760 associated with invention of steam power and mechanical manufacturing triggering urbanization and entrepreneurship (Mohajan, 2019; Kitole & Sesabo, 2022). The second industrial revolution began in America around 1860 until 1914. This stage was characterized by chemical industry, oil and gas, tap water with domestic pipes, electrical communication technologies, telephones, artificial fertilizers and mass production (Demir, 2021; Kitole et al. 2022). The third industrial revolution began in early 1945 following the World War II and it mostly emphasized the power of data. This stage was more characterized by the development of computer inventions, renewable energy technology and smart grid technology, and hybrid and fuel cell-based transportation (Philbeck & Davis, 2019; Dimoso and Andrew, 2021).

Julius Kambarage Nyerere (1932-1999) was born during the 2IR and lead Tanzania during the 3IR, during that time the technological know-how was serendipity happening in the developed countries not much in other continents. Such serendipity invention and innovations created inequalities which had not yet acquiring a good terminology we current embrace as "completeness'" resulting into "survival of the fittest". This means there is competing talents, technologies and knowledge in the labor market the societies in 4IR give priorities as mother of

innovations and inventions to increase productivity and efficiencies. Already the German colonial administration in Tanzania turned large numbers of people into slave laborers (Fumbwe et al. 2021; Kitole et al. 2023d). During colonialism there were no systematic attempts by the colonial administrators to address the issue of unjust wage apart from the brutal repression of those who demanded a just wage. Thus, Nyerere's circular economy dealt with provision of equality instead of the intricates of competitiveness which is embraced in the context of 4IR era we are living in.

The fourth industrial revolution the universities are operating in was firstly introduced in January 2016 by Klaus Schwab in his book titled "*The Fourth Industrial Revolution(4IR)*" (Xu et al., 2018). Fourth industrial revolution and industry 4.0 are used interchangeably and many academicians use industry 4.0 as the synonym of 4IR (Demir, 2021; Marzano & Martinovs, 2020; Kitole, 2023; Nasution, 2021). The main features of 4IR include the fifth-generation mobile network (5G), Cloud Computing, Artificial Intelligence (AI), three-dimensional (3D) printing, robotics, drones, biometrics, genomics, virtual reality (VR) and augmented reality (AR), internet of things (IoT), industrial internet of things (IIoT) and block chain (Mhlanga, 2022; Kitole et al. 2023a; 2023b). Fourth industrial revolution technology enables the transformation of the entire manufacturing structure of companies in terms of productivity at a faster rate while maintaining high quality at lower costs (production efficiency and economies of scale) (Kitole and Sesabo, 2022). With such automation cauterizing 4IR, the economic conditions have replacing human labor with automated and intelligent machines which are more accuracy enough to minimize transaction costs attributable to human errors and thus, it has replaced labor intensive capital investment to father reducing employment while graduates are flocking in the labor market every year seeking jobs. Furthermore, the 4th industrial revolution aims at transforming and improving production methods in industries (Marzano & Martinovs, 2020). The fourth industrial revolution has forced organizations, institutions, and MSMEs to navigate in searching for new way of employing more technical skills relevant the 4IR characteristics fueling graduate unemployment in case they are not prepared by the university curricula and policies to be acquainted with the skills that are required for self-employment (Madjid & Bahiroh, 2020; Kitole et al. 2023c). In the other way, fourth industrial revolution has created employability challenges to graduates since it requires people with extraordinary knowledge and creative ideas (Suganya, 2017). In the same way, Kovacs, (2018) argue that employability in the time of industry 4.0 has been a challenge because few employment opportunities do not require human interaction because most of works are automatically performed by robots and others supported by artificial intelligence.

Fourth industrial revolution is affecting the education systems of our time which results to a situation that employers do not care about educational qualifications and certificates obtained at different levels (Kalufya & Mwakajinga, 2016; Kitole, 2023). Employers care about soft skills, technological skills, work experience, and anything that enable an employee to fit in this current world of automation (Fajaryati et al., 2020; Kitole et al. 2024a). Thus, the world of automation does not only challenge employees or fresh graduates looking for job opportunities but also it has become so difficult for an individual who is not prepared to start a business and run it efficiently.

Moreover, human capital theory signifies that the more highly educated people are, the more successful they will be in labor markets particularly in employment opportunities (Paadi, 2014; cited Yuzhuo, 2013). The theory is useful in linking education offered by HEIs with employability skills required by the labor market (Kalufya & Mwakajinga, 2016) despite the rampant unemployment situation affecting the country. Unemployment rate in Tanzania started to increase since the 1970s when Tanzania was experiencing an Economic crisis and the country experienced a fall of Growth Domestic Product (GDP) growth rate from 5% to an average of 2.6% in the 1980s and 1% in the early 1990s (Nikusekela & Pallangyo, 2016; cited Tanzania Employment Survey, 2008). Following these consequences, most Tanzanian fresh graduates from high Learning Institutions (HEIs) are left hanging out there before they secure jobs due to limited employment opportunities. Employment in the formal sectors for both public and private sectors has been a challenge to Tanzanian fresh graduates, mainly due to skills mismatch (Emmanuel, 2015). Further, unemployment in Tanzania is regarded as a major national developmental challenge for years (Amani, 2017; Kitole et al. 2024b). According to the study conducted by Mwita, (2018) who described the perceptions and opinions of human resource officers on Tanzanian graduates' employability, the findings shows that human resource practitioners ranked Tanzanian graduates as average competitors of job seekers in the East African Community (EAC). It was found out that 56.6% believe that Tanzanian graduates were not competent enough to compete in the East African labor market. Other studies explains that higher unemployment rate in a country does not only imply that there are few employment opportunities but also sometimes graduates themselves are unable to acquire the available jobs (Ndyali, 2016; Kitole et al. 2024c). Despite the Tanzanian graduates being less employable, they are also not ready for employment especially in this world of technology due to a lack of awareness about the concept of industry 4.0 and the required skills that every graduate has to possess in 4IR era before joining the labor market (Teng et al., 2019). Therefore, in shedding light on the effects of 4IR on graduate employability in Tanzania, the current study answers the following research questions: (i) What are the employable skills in the fourth industrial revolution era?

(ii) Why self-employment is an alternative employment in the 4IR era the graduate need to be prepared for? (iii) How HEI can prepare the graduate for employability (self-employment) in 4IR era?

II. LITERATURE REVIEWS

Sarkar et al., (2016) cites ILO (2000) definition where it states that employability involves self-belief and an ability to secure and retain employment, in the other way it generally means being able to improve productivity and income-earning prospects. Fajaryati et al., (2020) argues that employability includes complex problem-solving skills, technical skills, higher-order thinking skills, personal skills, people/social skills, generic skills, and self-perceived employability skills which need to be enhanced by HEIs through providing placements, building a professional network, clear career directions, pathways, and opportunities. It is the role HEIs to embed employability skills (self-employment) within a degree they confer to graduates (Sarkar et al., 2016). Fajaryati et al., (2020) continues to argue that employability is the ability of an individual to get a job and fit the labor market demand. Employable graduate can be employed in any organization or be self-employed. According to Burchell et al., (2015), self-employment is defined as anyone who works for himself or herself, not for any other person or employer. Self-employment is the engine of regional, community, social and economic development simply because it is an alternative source of employment (Kumalo, 2017). From an economic perspective, self-employment is very important because it measures the health of labor markets and the economy. Increasing the self-employment rate may imply hidden unemployment since self-employment had become an option for individuals to work as an alternative to unemployment (Burchell et al., 2015).

On the other hand, industry 4.0 technology enables the transformation of the entire manufacturing structure of companies in terms of productivity at a faster rate, maintaining high product quality produced at lower costs, and economic conditions by replacing human labor with automated and intelligent machines. Table 1 below summarizes the nine technical skills pillars and their meaning in Industry 4.0.

Table 1

Summary of nine pillars of Industry 4.0 and its meaning

PILLAR	DEFINITIONS	EXAMPLES
Big data	Large, complex datasets that affect the decision making of companies	Big data analytics, algorithms, software programs in automated product value chain
Autonomous robots	Solve complex tasks which cannot be solved by human	Kuka Iowa has the learning ability to achieve some certain tasks
Simulation	Mathematical modeling, algorithms that optimize the process	Software programs
Horizontal & vertical system integration	Integration of inside of the factory and SCs	Smart factories, cloud systems
Internet of things	Connection of the physical objects and systems	Smart network
Cloud computing	Shared platforms that serve to the multiple users	Google Drive, Blue Cloud, Windows Azur
Additive manufacturing	3D printing technology, producing in mass customization	3D printers to produce smart phones
Augmented reality	Human-machine interaction on maintenance tasks	Google Glass
Cyber security	Cyber-attacks to business environment	National defense systems in order to prevent attacks

Source: (Erboz, 2017)

Table 1 above is about technical skills pillars required to employable in the 4IR. The 4IR era has transformed and improved production methods in different industries (Singh & Tilak, 2020). According to Fajaryati et al., (2020), it's not sufficient for an employee to have only technical skills, he/she needs to embedded with social skills. Top three skills were highlighted highly demanded in the future improvement which include cognitive abilities, complex problem-solving skills, and system skills. Moreover, Lase, (2019) argued that main skills that a graduate student requires in 21st century within the context of fourth industrial revolution are collaboration skills, communication skills, problem-solving skills, thinking critically, creativity, and innovation. According to (Erboz, 2017), there are nine pillars mostly used among industries of 4IR especially in manufacturing processes qualifying the requirements of 4IR.

Suarta et al., (2017) reminds that, despites having the general skills required for the industry 4.0 as mentioned by other researchers listed in Table 1 above, graduates are also required to possess personal skills including independence, reflectiveness, self-awareness, self-confidence, willingness to learn, stress tolerance, emotional intelligence, lifelong learning, flexibility and adaptability, creativity and initiative and professional behavior. Rotatori et al., (2021), conducted a study on the evolution of the workforce during the fourth industrial revolution, specifically on HEIs. The results show HEIs do not deliver graduates who are capable and who meet the market requirements whereby 30% of the respondents suggested that the outdated education system is the main concern and it will be the bottleneck for the future. Further, according to this study, there are gaps in the skills packages of those performing the roles of educators, instructors, and facilitators which results in poor learning and the teaching process that consequently deliver graduates who do not meet the 4IR requirements.

According to Madjid (2020), industry 4.0 have a positive influence in effectiveness and efficiency of resources and production cost minimization. However, industry 4.0 reduces employment opportunities and it has to be taken positively where workers must be embedded with digital literacy, technology literacy, and human literacy and therefore suggested that through the education system, they can develop soft skills, technical skills, and non-technical skills. From this point of view, it is clear that, graduates will be able to adopt the change and be competent with their careers to face the future.

III. METHODOLOGY

This case study was designed to address graduates' employability in the fourth industrial revolution era. A cross-sectional survey was applied to statistically establish the existed relationship among soft skills, hard skills, awareness of industry 4.0, preparedness for self-employment and graduates' employability. Explorative research design was employed to benchmark information for concepts about graduates' employability in industry 4.0 context. Further, this study used diagnostic and descriptive research design to describe the characteristics and abilities of university's graduates as far as employability (self-employment) is concerned (Kitole, 2023).

The unit of analysis was graduates students (Education level of respondent, Certificate, Diploma University first degree and Master's degree) registered by Mzumbe University in the final academic year of 2020/2021. The ample size was 100 respondents selected from sampling frame of 2, 524 finalists using stratification random sampling techniques to programs from all university faculties /directorates offering master's degrees. Data for this study were collected by using well-structured questionnaire since the study only involved primary data (Kalufya & Mwakajinga, 2016). Quantitative data were analyzed and presented by using both descriptive and inferential analysis. Further, a multiple linear regression model estimated by ordinary least square (OLS) to establish relationship was carried out (Dalenogare & Benitez, 2018; Rimisho, 2019; Sani, 2020). Moreover, data were processed and analyzed statistically. Table 2 describes the summary of variables, measures, measurements used, variable type and expected signs tested.

Table 2

Variable measurements and expectation

Variables (Dependent)	Measures	Measurement	Variable type	Expected sign
Graduates' employability in 4IR era.	This element measures the ability of a graduate to get employed and fit in the labor market of industry 4.0	Number of employability skills	Continuous	Dependent
Soft/Life skills	This element measures the soft or life skills that enable an individual to successfully work in the environment he/she lives	The number of soft/life skills a respondent posse	Continuous	positive
Hard/technological skills	This element measures the individuals' technical competences or expertise	The number of hard/technological skills a respondent posse	Continuous	Positive
Preparation for self-employment	This element measures the preparedness and readiness of an individual toward self-employment	1 if the respondent is prepared for self-employment 0 otherwise	Categorical	Positive
Awareness of industry 4.0	This element measures the general understanding of an individual toward industry 4.0	1 if the respondent is aware of industry 4.0 0 otherwise	Categorical	Positive

On the other hand, in modeling the students' employability in the 4 industrial revolution the probit model was used to estimate students' perception of employment status. The choice of the model is based on the need to estimate the probability of which students picture themselves in the 4 industrial revolution. Therefore, for Probit model, the study considered an equation which describes the students' employability in the face of 4 industrial revolution is given as:

$$y_i^* = \beta w' + \mu_i\,, \qquad \mu_i \sim (0, \delta^2)$$

Whereas y_i^* is the dependent variable which assume unobservable status, β represents the independent variable, w' represents the coefficient of the independent variable and μ_i is the error term with standard normal distribution. Since y_i^* is unobservable, what we observe is $y_i$which takes only two values such that:

When $y_i^* > 0, y_i = 1\ if\ employed$

When $y_i^* \leq 0, y_i = 0\ \ if\ not\ employed$

The likelihood of students to be employed is herein presented by unobservable factors through the dependent variable as follows:

$$Employability\ in\ 4\ Industrial\ revolution = \begin{matrix} 1\ if\ if\ employed^* > 0 \\ 0\ if\ not\ employed^* < 0 \end{matrix}$$

Therefore, the probability that students will be employed is based on the assumption that the probability density function of $e_i$assumed being $f(\mu_i)$ which results in the creation of new parameter.

$$Prob(y_i = 1|x|) = \int_{-\infty}^{x'\beta} f(\mu_i)du = F(x_i'\beta)$$

$$Prob(y_i = 1|x|) = 2\pi^{-\frac{1}{2}} \exp\left((-\beta x_i)^{\frac{2}{2}}\right)$$

Now, based on the variables used in this study the Probit model is therefore presented as:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 D_i + \mu_i$$

Of which the β_0 is the constant term while β_1 and β_2 are the parameters that will be estimated in the probit equation. On the other hand, X_i are the covariates while D_i represents group of all dummy variables used in this study. Now, since the Probit model is well addressed under the marginal effects then the preferred marginal effect equation is shown as

$$\frac{dy}{dx_i} = \beta_i \emptyset(\beta_1 + \beta_n)$$

IV. RESULTS

Sample characteristics in this study included the age, gender, and level of education. Both males and females were involved in this study because the researcher wanted to collect views, experiences, and evidence from both genders to obtain diverse information. The female respondents were 36(36%) out of 100 (100%) and male were 64(64%) out of 100 (100%) sample size described in Table 3 below.

Table 3

Gender of the respondents

Gender of the respondent	Frequency	Percent
Female	36	36
Male	64	64
Total	100	100

Table 3 above shows the number female and male, as expected the number of male graduate students surpasses that of female as expected. However, even the female students who were requested to participate were reluctant to fill in the questionnaire. However, the ratio between male and female students across the university is a reasonable representation of this study because it does not count as a sensitive case.

The age of respondents was very important to be known because it helps the researcher to analyze the information obtained from the field since it is not the same as the way an adult argues and the way youth argues. The results were analyzed and presented in Table 4.

Table 4
Age of respondents

Age (Years) of the respondent	Frequency	Percent
15-25	78	78
26-35	22	22
Total	100	100.0

Table 4 presents the age of respondents in two categories of (1) 19 to 25 years old and (2) 26 to 35 years old. The first category of the age ranging between 19 and 25 were 78 (78%), and that ranging from 26 to 35 which were 22 (22%) of the total number of respondents.

As it was stratification and partly snowballing, the education levels of respondents were classified into the certificate, diploma, bachelor's degree, and master's degree presented in Table 5.

Table 5
Education level of respondents

Education level of respondent	Frequency	Percent
Certificate	7	7
Diploma	2	2
University first degree	89	89
Master's degree	2	2
Total	100	100.0

Table 5 shows that 7 (7%), 2(2%), 89(89%), 2(2%) certificate, diploma, first degree and masters respectively out of 100 (100%) finalists.

Table 6
Description of graduates' employability, life/soft skills, technical/hard skills, and preparation for self-employment

Variable	Observation	Mean	Std. dev.	Range	Minimum	Maximum
G	100	5.53	2.418	11	0	11
SS	100	3.51	1.494	8	0	8
TS	100	2.79	1.506	7	0	7
PSE	100	0.71	0.456	1	0	1
A_4IR	100	0.31	0.464	1	0	1

Where:

E=Employability in industry 4.0
SS = Life/soft Skills
TS = Technical/hard Skills
PSE=Preparation for self-employment
A4IR=Awareness of fourth Industry Revolution

Graduates' employability in industry 4.0 was assessed by looking at the employable skills that are required in industry 4.0 and the results showed that, mean of graduate's employability in industry 4.0 is 5.53 and the standard deviation is 2.418 while the range is from 0 to 11, the range is very small which imply that data has not so much deviated from the mean.

It was important to capture graduates' preparation for self-employment because the fourth industrial revolution requires people who are ready, creative, and with extraordinary ability to adapt to the working environment (Suganya, 2017). It was also essential to capture this variable because it is the best alternative source of income and employment opportunities and also the key to higher economic growth compared to wage employment (Kumalo, 2017). The research findings showed that the mean of preparation for self-employment was 0.71 and the standard deviation was 0.456 which implies that the data has not deviated from the mean. From the 100 administered questionnaires, the

results showed that 29% of the respondents were not prepared for self-employment and 71% were prepared for self-employment as illustrated in the figure below:

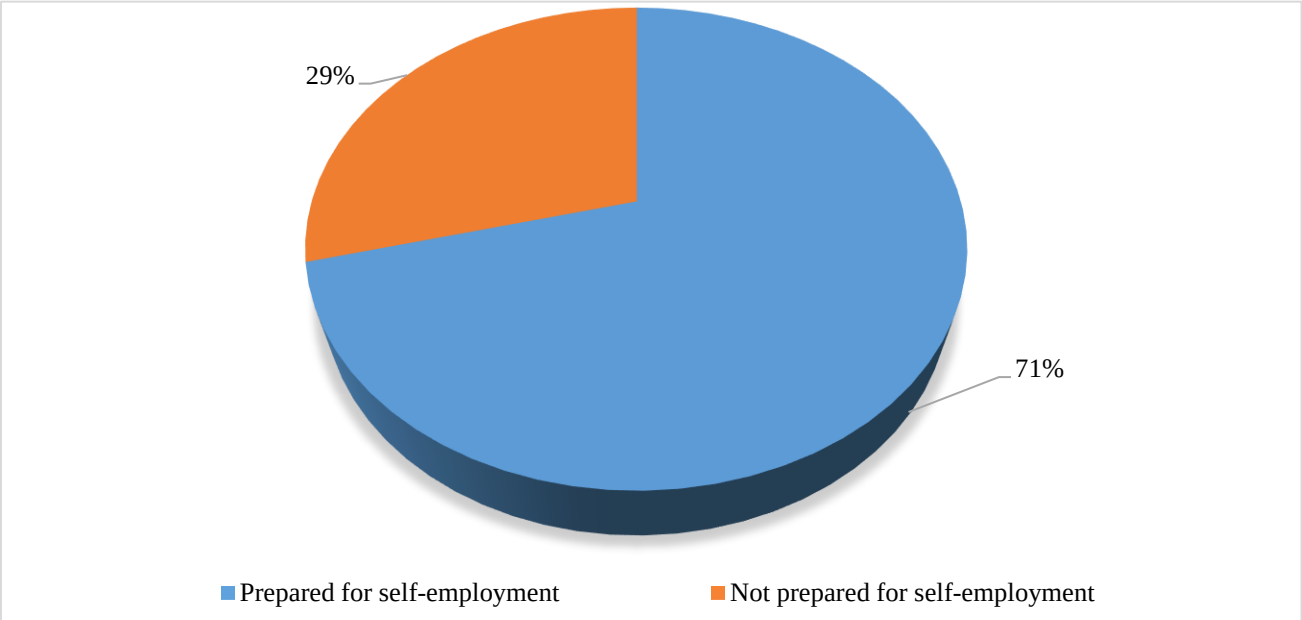

Figure 1
Self-Employment Preparedness among University Students

Figure 1 implies that a higher percentage of students 71% are self-employment prepared (employable in the private sector) and a few (29%) were not prepared for self-employment. The group responded that it was difficult for most of the graduates to be employed in the world of technology as the 4IR needs but still is still lacking among the youth. These results align with the results of Zafar et al (2021) which justifies due to the challenges in the formal employment most students tend to prepare themselves for the engagement in the self-employment and informal businesses.

In the questionnaire of this study, skills information were captured in two different ways, first were on the employability skills in industry 4.0 that a respondent has acquired both soft and technical skills and the second category required the respondent to select skills that he/she thinks are important to possess and make him or her employable and it also included both life skills and technical skills. The maximum number of employability skills in industry 4.0 that respondents said they have acquired was 11 and the minimum was 0 skills (see Table 4.4), the majority said that they have acquired computer programming and simulation training in technical skills while in soft skills the majority said they have acquired complex problem-solving skills, creativity, critical thinking, coordination with others, judgment and decision making and negotiation. In the other category, respondents picked skills that they thought will make them employable and the maximum number of life skills that respondents picked were 8 while technical skills were 7 while both having a minimum skill of 0 (see Table 4.3). The majority picked problem-solving skills, communication skills, leadership skills, writing skills, and others suggested public speaking skills in the sub-category of life skills while picking big data analysis, design and project management, social media management and digital marketing, coding and programming, and others suggested web development, drawing skills and Graphics design in the sub-category of technical skills.

4.1 Relationship between life/soft skills, hard/technical skills, awareness of the forces employability of 4IR (Self-employment)

Multiple linear regression was performed to measure the extent to which the independent variables which include life skills, technological skills, preparation for self-employment, and awareness of industry 4.0 contribute to the graduates' employability in industry 4.0. Regression results are summarized in Table 7;

Table 7

Results on multiple regression analysis

Variables	Coefficient	Standard error	t	p>|t|	Confidence Interval	
Soft skills	0.514	0.142	3.61	0.000	0.232	0.797
Technological skills	0.337	0.156	2.15	0.034	0.026	0.648
Preparation for self-employment	1.038	0.467	2.22	0.029	0.111	1.966
Awareness of 4th Industry revolution	0.976	0.451	2.16	0.033	0.080	1.872
Constant	1.742	0.564	3.09	0.003	0.622	2.862
Number of observations		100				
F(4, 95)		14.07				
Prob>F		0.0000				
R squared		0.372				

The results from Table 7 show the overall fitness of the model which resulted in F-test 14.07 and prob > F = 0.0000 which is less than 5% (0.05) significance level, this implies that the model is statistically significant and the model has an explanatory power to predict the contribution of life skills, technological skills, preparation for self-employment and awareness of 4IR in development of graduates' employability in industry 4.0. R-square is 0.37 which implies that 37% proportion variation of graduates' employability in industry 4.0 is jointly explained by life skills, technological skills, preparation for self-employment, and awareness of industry 4.0.

Furthermore Table 7 above, results revealed that there is a positive relationship between life/soft skills, technological/hard skills, awareness of industry 4.0, preparation for self-employment, and graduate's employability in industry 4.0, shown by positive coefficients of 0.514, 0.337, 0.976 and 1.038 respectively. Life/soft skills, technological/hard skills, awareness of industry 4.0, and preparation for self-employment were found significant at a 5% significance level with p-values of 0.000, 0.034, 0.033, and 0.029 respectively. Simply the findings suggest that a graduate (finalist) who is aware of industry 4.0, is prepared for self-employment, and have soft/life skills and technological/hard skills.

4.2 Model Diagnosis Results (Validity and Reliability of the Data)

Variance inflation factor (VIF) as the STATA software command was used to test for the problem of co-linearity among explanatory variables. The results revealed an average VIF of 1.23 which is less than 5 which simply means that the model was correctly specified and so there was no multicollinearity. In the other way, Breusch – Pagan /Cook-Weisberg method was used for testing Heteroscedasticity by applying the hottest command in STATA software. The determinant factor focused on the probability of Chi2 of which the results revealed a probability of 0.1468 meaning that it is statistically insignificant at 5%, hence homoscedasticity. Homoscedasticity or homogeneity of variances shows the strength of the relationship with low standard errors. It is an assumption of equal or similar variances in employability in industry 4.0, life/soft Skills technical/hard skills, preparation for self-employment and awareness of fourth industry revolution being compared. Our model is a parametric statistical model, testing it using Chi-square was necessary because they are sensitive to any dissimilarities/ there were no uneven variances in in the sample results which in biased and skewed test results

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Graduates' employability in industry 4.0 is highly contributed by soft/life skills, hard/technological skills, awareness of industry 4.0, and preparation for self-employment. The regression results showed that there is a positive relationship between preparation for self-employment, awareness of industry 4.0, technological skills, life skills, and graduates' employability in industry 4.0. This simply brings us to the conclusion that a graduate who is prepared for self-employment, aware of industry 4.0, and has a higher number of technological and soft skills is more likely to be

more employable and vice-versa. Hence, the universities such as MU must review the curriculum to embed those technologies to make graduate satisfy 4IR employability in this study a graduate must be ready to use his /her education to employ himself/herself after graduation and by so doing creation of own job and the others is made possible.

5.2 Recommendations

It is recommended that, responsible bodies which includes but not limited to Ministry of education, TCU, and MU should emphasize, insist and promote work integrated learning (WIL) which will involve the integration of academic learning and its practical applications rather than current field attachment programs which in most cases students do not get the real experience of their area of expertise. WIL develop sense and awareness of workplace culture, it enhances soft skills and advance theoretical understanding, manage future career aspirations and decisions and boost employment prospects. WIL, especially in a professional setting, will allow students to grab basic work capabilities and they will be considered to be more desirable's hires because of the prior experience they will get and their connection with the industry.

MU like any other university in Tanzania should embed employability within the courses that are taught in normal classes to enable students to grab employability skills and gain awareness on how they can fit in employment markets, procedures for a job application, and basic foundation for self-employment (entrepreneurship education). This can be applied by all other HEIs and cemented by TCU alongside Ministry of Education, Science and Technology and Minister of State in the Prime Minister's Office Policy, Parliamentary Affairs, Labor, Employment, Youth and the Disabled. Embedding employability within the degree will smoothen the struggle of university graduates of looking and complaining about employment opportunities.

The fourth industrial revolution is characterized by the use of high technology and the nature of employment in its era requires people with the best technological know-how. TCU, HEIs particularly MU should restructure their teaching curriculum following the employment requirement of industry 4.0 which in most cases requires technological-based skills and soft skills. Restructuring curriculums will reduce individual struggles among graduates by increasing their marketability and that role will be executed by education providers through curriculums restructuring. It will benefit both students and education providers because when the curriculum is technological and soft skills based then education providers will have to extrude themselves and grab basic skills about industry 4.0 (for those who don't have it) to deliver the same to the students.

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