

A study investigating the impact on graduate unemployment in Eastern Cape

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Abstract

Despite the vast research that has been conducted on the national level, little has been done to address the problem of youth unemployment provincially. Eastern Cape Province consists of four universities that have produced well-groomed scholars yet the province does not have enough capacity to harness their skills. This is evident from the high levels of unemployment and a stagnant economy. Furthermore, it has not been able to combat poverty which contributes to high levels of inequality.

It will further explore the number of graduates produced by Eastern Cape universities from 2005 to 2015. The main objective of this paper is to determine levels of graduates in the province and assess the graduate's contribution make on the economic growth of the province. This will be achieved by exploring the number of graduates produced by Eastern Cape universities from 2005 to 2015 and investigating the impact of this on graduate unemployment in the province. Further economic models will be presented to evaluate the cointegration between graduate unemployment and economic growth in the Eastern Cape. The paper will be based on quantitative data from various sources. This is intended to propose policy recommendations, in terms of strategies and programmes that can be put in place for reducing unemployment.

Keywords: Graduate unemployment, Economic Growth, Eastern Cape.

1. Introduction

Following 2007/2008 global financial crisis, the main risks and challenges facing the global economy is persisting unemployment, poverty and inequality in developed and developing countries. Unemployment is one of the triple challenges facing South Africa. Levels of

unemployment and inequality in South Africa are critically high (Fry, 2006). Furthermore, in 2014 the official unemployment rate was 25.2 percent and 2015 it had increased to 26.4 percent (Statistics South Arica, 2016). This is an indication of a reduction in economic welfare and output as it was suggested by Oluwajodu et al (2015). This paper focuses on the graduate proportion of the total youth unemployment in Eastern Cape.

Eastern Cape Province is one of the provinces that are confronted by the high rate of youth unemployment. Youth is defined as persons within the age of 15-34 years (Department of Basic Education [DBE], 2011). A number of these years is spent at institutions of high learning where they are prepared for the corporate world. However, the rising number of graduates at tertiary educational institutions is not complimented by the number of graduates being employed every year. The province has four universities that produce well-groomed graduates but the province has no enough capacity to harness their skills. A total of 137 888 of graduates has been produced by the Eastern Cape Universities from 2005 to 2014 (CHE:2016). Nevertheless, unemployment among youth in the Eastern Cape Province is still very high and is increasing every year. This can be seen from a nominal increase of 9 percent unemployment rate from 2008 to 2015 (Statssa, 2016). This appears to be true and more people are leaving Eastern Cape Province for other provinces such as Gauteng, Western Cape, 'KwaZulu-Natal, and so forth in the anticipation of finding jobs. A number of studies that investigate youth unemployment has not given much attention to provincial graduate unemployment. This study attempts to bring forward additional influencing factors on graduate unemployment in relation to economic growth.

This gives rise to difficult questions which require an investigation such as:

- What is the relationship between graduate unemployment and economic growth?
- What are the determinants of Youth/ graduate unemployment in Eastern Cape?
- Which strategies and programmes can be applied to reduce unemployment in Eastern Cape?

2. The rationale of graduate unemployment

To acquire a University degree was once considered a guarantee for securing a paid employment in the public or the private sector (Idowu, 1987). Despite the rise in youth graduates from the four institutions of higher learning in Eastern Cape, graduate unemployment is rising together with the overall unemployment rate. The inability of graduates to be employed does not only affect their own lives and career growth but is arguably a reflection of teaching standards and the quality of current higher education. A worrisome reality remains to be the increasing trend of graduate turnout each year and the inabilities of Eastern Cape labour market to absorb those graduates. These graduates have become the cohort of the forgotten. The delaying transition from the education system to the labour market is worrisome as there is no guarantee of when it will come to an end. This is not only a challenge faced by the Eastern Cape, it is one of the socio-economic challenges facing Limpopo, Mpumalanga province and the country as a whole. In attempts to address the problem, the government has implemented different policy responses and schemes.

A number of times unemployment and under-employment has led to graduates leaving the province and move about or migrate. It remains important to discover whether graduate leaves the province because they are over qualified or no jobs and the careers they have chosen have limited capacity for employment. The main objective of this paper is to determine levels of graduates in the province and assess the graduate's contribution make on the economic growth of the province. This will be achieved by exploring the number of graduates produced by Eastern Cape universities from 2005 to 2015 and investigate the impact this has on graduate unemployment in the province.

It remains important that graduates find employment in the areas they live in. However, these are the same communities with high levels of unemployment regardless of graduates produced in such areas. This makes socio-economic inequalities persist and intensify.

2.1 Policy responses to unemployment

The following policies and schemes have occurred in South Africa in attempts to reduce unemployment, improve the livelihood of citizens and contribute to the growth of the economy. This refers to Growth Employment and Redistribution (GEAR), Accelerated & Shared Growth Initiative South Africa (ASGISA), the National Development Plan (NDP), National Youth Development and Harambee. ASGISA aimed to halve poverty and unemployment by 2014. It can be argued that the policy frameworks applied have not been able to adequately curb the problem of graduate unemployment and remains to be seen whether the NDP will be a solution.

2.1.1 National Youth Development

This policy was introduced in 1996 to stimulate faster economic growth which was required to provide resources to meet social investment needs. Under GEAR policy, fiscal deficit, inflation, and government consumption targets were all slightly met, reporting figures of 2.2 percent, 5.4 percent, and 18 percent respectively by the end of 2000 bringing about greater macroeconomic stability, better reporting and increased accountability (South African History Online, 2017). However, despite these achievements, private investment, job creation, and GDP growth indicators were disappointing.

GEAR was known as one of the policies to set the economic future progress. Laws and programs which complemented this policy through Black Economic Empowerment were also set. Through the BEE the aim was to increase opportunities of employment for people who were classified as Black, Coloured or Indian. Improving their skills was one of the important contributions expected. The vision of the macroeconomic strategy was "a competitive fast-growing economy which creates sufficient jobs for all work seekers; a redistribution of income and opportunities in favour of the poor; a society in which sound health, education and other services are available to all; and an environment in which homes are secure and places of work are productive" (Department of Finance, 1996:1). GEAR had a good on developing human resources, however this was not enough. It is disturbing that 21 years after the introduction of GEAR we are still faced with the same challenges.

2.1.2 Accelerated & Shared Growth Initiative South Africa

ASGISA is one of the many policies that have been implemented in South Africa to address the challenges of the Nation. In 2004, the aim of the government was to increase the country's gross domestic product growth rate to a sustainable level of 6 percent by 2010. It further aimed to halve the unemployment and poverty by 2014. One of its mandate was to halve poverty and unemployment by 2014. Among its six initiatives one was on skills and education initiatives. The importance of skilled professionals such as engineers and scientists, managers such as financial and project managers and artisans was realised. Due to the slowness of the education and institutions that were meant to catch up with the acceleration of economic growth these were not achieved. It was also highlighted that uneven quality of education was a factor. At this stage there was good business confidence, the economic performance was expected to rise as there were expectations of growth around 4.5%, there was hope of job creation. The set targets were a ladder to creation of opportunities for more labour absorbing economic activities.

Programmes such as the Employment Service System were meant to close the gap between potential employers and employees. Furthermore, Umsobomvu Youth Trust had initiatives that enhanced skills through volunteering opportunities.. Lastly, Joint Initiative for Priority Skills Acquisition (JIPSA) was introduced to identify urgent skills needs and bring effective solutions. Various resources were used such as retirees, mentoring and providing opportunities for overseas placement of trainees. The reality of today is that regardless of good policies put in place South Africa is still faced with the same challenges it had 10 years ago. To make matters worse the shrinking economy does not provide us with good prospects for the future.

2.1.3 Harambee

South Africa has adopted a number of schemes to curb unemployment such as National Youth Development, Harambee has attempted to find jobs for youth through screening for numeracy and literacy potential and assessing to determine which sector they would be best

suited for. Once that process is complete they either routed into different bridging programmes depending on their match to industry requirements or counselled out of the programme if they do not meet placement criteria. In 2014, Harambee reached the target goal of placing 10 000 young people (Graham & Mlatsheni, 2015). Harambee reached this goal through connecting the employers looking for entry level talent to young, high potential work seekers who are currently locked out of the formal economy. Once an individual register at Harambee website, they assess individual's competencies and match them to jobs where they are most likely to succeed. This is indeed a great achievement however it requires other parties to do more if unemployment is to be reduced .

Graham & Mlatsheni (2015) argues that Harambee does track participants and relies on feedback from employers and found that 75 percent of their placements stay on the job for at least 12 months. Based on these outcomes it can be argued that Harambee is addressing both demand and supply side of the labour market, that is, employers and harnessing youth desire to enter the labour market.

2.1.4 National Youth Development

Initiatives have been made through the National Youth Development Agency in 2009 which was to put into practice Integrated Youth Development Strategy (IYDS). This mainly aimed to ensure youth development in government departments and the private sector. Again one wonders where have these policy frameworks failed in addressing the alarming rate of unemployed graduates?

In 2011 it was suggested by National Treasury that the high rate of youth unemployment is as a result of insufficient demand in the labour market to address the rising number of youth job seekers. It was then that the proposal of a youth subsidy came forward. The aim of the youth employment subsidy was mainly to create jobs for youth. Whether its implementation resulted on the reduction of employment requires an investigation.

2.1.5 National Development Plan

It contains the vision of South Africa by 2030 and how youth oriented programmes would have curbed unemployment. Through the NDP it is envisioned that the challenges facing youth such as graduate unemployment would have been reduced by a huge margin through broader opportunities. Universities that produces a large number of graduates should be considered an advantage to the country. It only becomes a major advantage when graduates are employed productively. This has not come to realisation in South Africa. Frameworks such as New Growth Path (NGP) from 2010 which is a predecessor of NDP had a target to create 5 million jobs by 2020 and it's far from being a reality. Regardless of the attempts made by the government, there is not much that can give hope on reaching the set targets by 2020.

The South African economy has not been able to absorb graduate growth that attempts to enter the labour market. It can be argued that there has not been much economic diversification in the Eastern Cape. This is attested by the -1.4 contraction realised in the 1st quarter of 2017.

2.1.6 Collective effort to curb graduate unemployment

Despite various policies that have been introduced in attempts to reduce unemployment it remains difficult to express the intensity of the upheaval of graduate unemployment. As Josef Stalin puts it that "one death is a tragedy however a million deaths is static". Millions of South African citizens remain without jobs. If all the policies that seemed good in the policy maker's terms did not achieve the intended purpose this calls for a structural transformation. This by no means overlooks the contribution made by various policies and schemes on increasing the skill's level . It also does not overlook the jobs created by some of the policies as indicated above. However, it does recognise the inherent weakness of not achieving the set targets. It also does recognise that through the projects and initiatives that were proposed, designed and implemented the province has not been able to brake the cycle of unemployed graduates.. Therefore, this means we are in a crisis.

The argument made is that the Eastern Cape's economy has not been able to absorb the graduate output of the province. We should all be concerned by this provincial crisis and be catalyst of change for the betterment of our province. This calls for unions, policy makers, institutions of high learning and employers to make a marginal contribution on creating employment opportunities for Eastern Cape graduates. Municipalities should be geared to promote provincial growth and sustainable employment during this period of stagnant economy.

The province requires an employment approach for the unemployed graduates it currently has, not the experienced graduates it wishes it had. This should not be limited to jobs that are in a form of social security but should be expanded to jobs that creates future prospects for the graduates. The provincial departments and private sectors should revise the minimum experience required at an entry level. Until we understand the nettle experienced by unemployed graduates we will unite and search for means that will bring forward solutions for this generation.

3. Literature review

On this section, the paper explores the determinants of unemployment from the micro and macroeconomic perspective. Furthermore, a variety of theoretical methods will be investigated. Lastly, empirical literature will be presented.

3.1 Theories and Empirical Literature

There are different views from economists that indicate causes and remedies for unemployment. This can be identified from the Keynesian explanation which indicates that the little demand for labour by firms is as a result of too little goods demanded by individuals. Classical view brought a different approach which suggested that natural market forces are

the remedy that can clear unemployment and is believed that this is a voluntary process. On the other hand Neo-Classical theory brought forward the concept of natural rate of unemployment, this shows the individuals preferences, endowments and the rate of technology. From this approach, it is believed that through flexible wages in a competitive labour market whereby those wages can adjust to clear unemployment, any other person will be voluntarily unemployed. It is clear that unemployment is a challenge that has been looked into by different theories however no single theory has brought forward a sufficient solution. Schultz (1960) and Becker (1964) argue that unemployment rates are decreased when there is a high level of training. A number of initiatives have been implemented which aimed to contribute to human capital. It is of that reason more educated people who have invested in human capital seek to get returns from their investment (Jamoussi, Gassab 2011).

3.2 Human Capital

The theory of human capital enlightens us about the positive relation between educational qualifications and higher earnings during the period of employment by the person. This encourages people to invest in education due to the returns. The basic principle of the human capital theory is that education and training enhances an individual's human capital and consequently raises the individual's potential to be productive at work. The human capital theory believes that education expands the ability of workers on being productive. This is attained through knowledge and skills. Individuals human capital expect returns through higher earnings. Barker (2007) concurs with this view by highlighting that such investment leads to improvements and better standards of living in the labour market. One would then note that there are short and long term benefits that come as a result of this theory such as satisfaction when employed, the status that comes as a result of qualifications attained and employment. The monetary value comes as a long term benefit. This creates a desire for many people to invest in education and can be seen on the large number of people that apply to further their studies.

Bosworth et al. (1996) states that in the long run human capital theory indicates that skilled workers will get compensation for the costs they incurred while obtaining their skills. This

indeed gives good prospect for the future for those who are still attaining their skills through different training programmes.

3.2.1 Human Capital

The human capital theory has often been used to promote and explain the enormous investments in education as an instrument that enhances economic development and growth. For those who are getting educated the Human Capital Theory brings good future prospects however for the unemployed graduates all is gloom. The investments made by many graduates have not matched employment which would lead to returns in investments. This can be testified by the high rate of unemployed graduates whose investment seems to be without returns. The skills attained are not finding a match in the corporate world. One wonders whether the issue is really on skills mismatch or the economy does not create enough jobs to match the graduate output. This therefore means there is a large proportion of people who are willing to work, who have the ability to be productive but there are limited job opportunities.

The mere presence of graduate unemployment opposes the prophecy of human capital. Rather than the gain there is pain from a number of unemployed graduates. Furthermore, the model implies that there will be no gap between transition from tertiary to getting into the labour market. It further indicates that after employment the likelihood is that one would be employed until retirement. This is far from reality. The challenge of graduate unemployment is real and the theory does not address it.

3.3 Unemployment worldwide

Unemployment is known to be an issue that can be tracked back in the 1930s (Harman, 2009). The effect it has within economies is still felt today. In 2015, it is stated that youth unemployment stabilized to 13 percent and still above the pre-crisis level of 11.7 percent. There is a challenge of a growing labour force which is not provided for through creation of

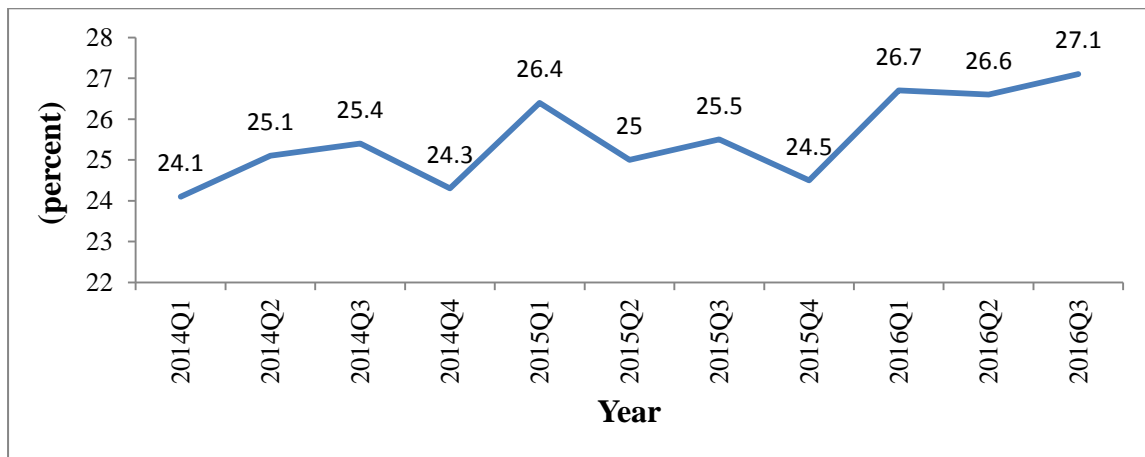
enough jobs by global economy. This also brings concerns for the youth who are left without jobs globally. The World Bank (2013,4) estimated that 40 percent of the world's unemployed are young people. A number of factors are known to have led to unemployment, such as the financial crises, lack of qualifications, skills mismatch, and lack of entrepreneurship and life skills education, digital divide and jobless growth. Ortiz and Cummins , (2012.1) identifies youth bulge as a problem for more than 120 million young people who enter the labour market for the first time yearly.

3.4 Unemployment in South Africa

Post-apartheid South Africa has been consistent on high unemployment rates. Dias and Posel 2007,1 asserts this view when they state that there has been a continually increase of unemployment rates since the end of apartheid. The unemployment rate in South Africa has reached its crisis proportion. A number of initiatives have been employed however no much success has been achieved.

In 2015 January, South Africa was ranked 8th position by the International Labour Organisation on the unemployment rate. Business Tech, (2015) asserts this view by indicating that South Africa has been in the top ten countries with highest unemployment rates since 1997. In the third quarter of 2016, the unemployment rate rapidly increased to 27.1 percent as compared to 25 percent of the previous quarter of 2015 as indicated on figure 1 below (StatsSA: 2016). This percentage is regarded as the highest.

Figure 1: Official unemployment rate in South Africa

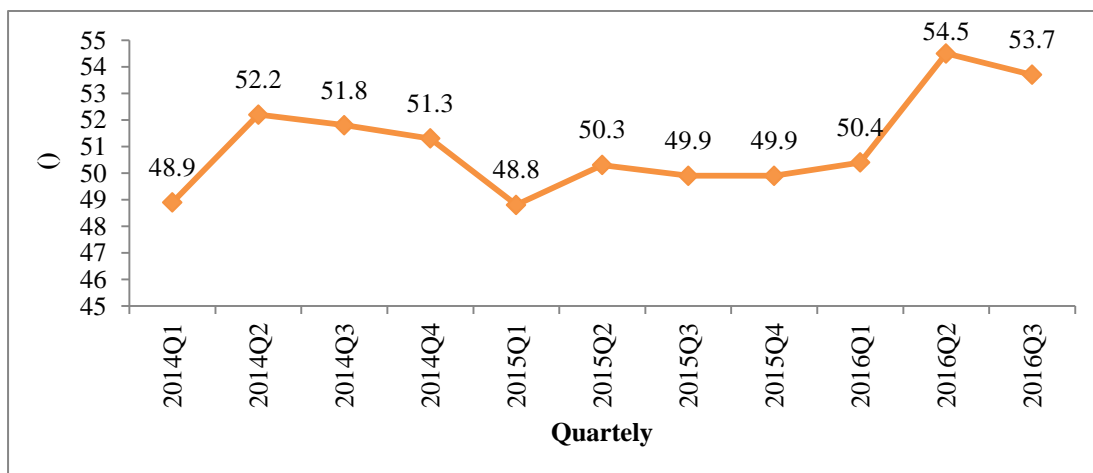


Source: Stats SA, 2016

Employment creation and reduction of unemployment remain a key social difficulty facing South Africa (Leibbrandt et al., 2010:p4). Furthermore, Barnerjee et al., 2008.716, Mohr et al., 2009.498, Oluwajodu et al., 2015.2 and Pauw et al. 2008 all identified unemployment as a serious economic challenge in South Africa and is still prevalent.

Figure 2 shows that the youth is the largest contributor to unemployment with a high record of 53.7 percent in the third quarter of 2016 as compared to 49,9 percent of 2015 (StatsSA 2016). A record low of youth unemployment was 48.8 percent in the first quarter of 2015.

Figure 2: Youth unemployment rate in South Africa



Source: StatsSA, 2016

3.5 . Graduate unemployment and its determinants

A graduate is defined as an individual with a degree or a diploma. This is taken from Van Der Berg and Van Broekhuizen (2012.2) who defined graduates as individual with at least a bachelor's degree or equivalent and higher educational qualification.

Over the years institutions of higher learning have produced a number of graduates for the corporate world. It can be argued that all over the world the labour market has not provided for graduates which have contributed to a rise of unemployed graduates. Most graduates do not get practical training in line with the industries of interest. On a different point, Broekhuizen (2012.9) noted that graduate unemployment is associated with quality of school education, university access, curricular and economic structure. Furthermore, Henley, (2013.4) and Shierholz et al., (2014.4) states that some of the graduates tend to be underemployed on jobs they were not educated for, that is, they are underutilized.

Global unemployment has been seen to take an increasing turn in form of graduate unemployment. A number of determinants are considered vital on employment status for a large number of graduates. Lippman and McCall (1976) brought some models used to investigate the determinants of unemployment. They highlighted education, economic condition, skill and experience as some of the important determinants employers pay attention to. This model predicts that chances of an individual to accept the offer of employment is informed by the minimum acceptable wage. Borat (2007) states a variety of economic and social theories that determine unemployment. Economic theory states that more education outcomes lead to a higher possibility of employment.

3.6 Economic circumstances

The ability of an economy to create and absorb jobs is determined by its conditions (Swanepoel and Van Zyl, 1999.264. The inability of the economy to create jobs will lead to high rates of unemployment. This is exactly what is currently experienced in South Africa. Some of the well known economic factors of unemployment remain to be structural

unemployment, frictional unemployment, and cyclical or voluntary unemployment. From macro perspective, structural unemployment is as a result of the attributes required by industries from graduates. In most provinces such as the Eastern Cape, these attributes have not been met. Griesel and Parker (2009) states attributes regarded to be key for employers such as proficiency in English and communication, personal initiative, soft skills and a strong work ethic. The skills mismatch between what is demanded and what is supplied is the essence of structural unemployment. This has also been attested by the Industrial Development Corporation (IDC,2014.21) as it identified skills mismatch, rigidities to the labour market, the weak relationship between wage increases and productivity growth as the main factors behind the inability of the economy to absorb a growing labour force.

It is not clear whether it's the universities failing graduates to get proper jobs or the absence of cooperation between firms and universities so that the output may meet the set standards of firms. However, it is clear that a practical experience with skills to complement the theoretical knowledge gained from universities remains what can be achieved through a memorandum of understanding between institutions of high learning and the firms. It remains the only hope to close the gap between capital supply and employers demand structure.

It can be said that when graduates seek jobs for the first time they have high expectations. There appears to be an asymmetry between information supplied by labour and their expectations. When these expectations are not met through what they deem to be the minimum acceptable wage they continue searching, however, when marginal revenue is less than the marginal cost that brings frictional unemployment.

Other graduates decide to stop looking for work when they feel that what is offered is not equivalent to the investment made with years spent at tertiary. This brings voluntary unemployment.

3.7. Empirical studies on graduate unemployment, unemployment and economic growth

“The General Theory of Employment, Interest and Money” by Keynes when restating identified the ultimate independent variables as (1) the three fundamental psychological factors, namely, the psychological propensity to consume, the psychological expectation of future yield from capital-assets,(2) the wage-unit as determined by the bargains reached between employers and employed, and (3) the quantity of money as determined by action of central bank; these variables specified above determine the national income and the quantity of employment.

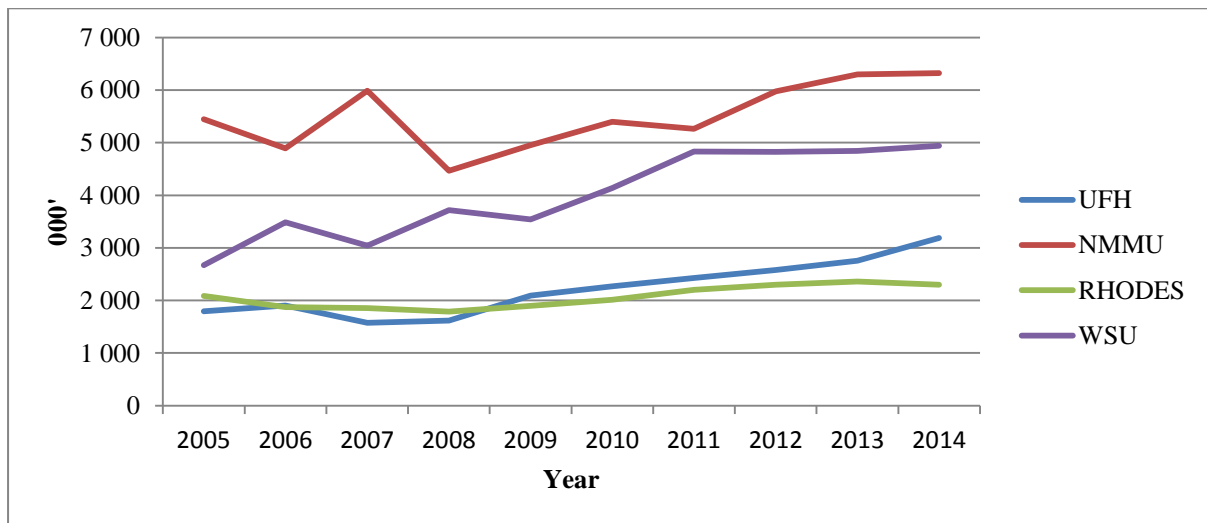
Akpan (2006) in his paper “ Economic Incentives for employment generation” identified economic incentives that can cultivate economic expansion for job creation and employment generation. The paper promotes the policies to be informed by the understanding of structures and relationship between the various variables within the economy. Policies that enhance higher linkages in the economy should be given preference. Integrated rural-urban development and entrepreneurial development should be used as a measure that would lead to employment generation.

Fajana (2000) also states that unemployment can lead to loss of status, loss of prestige and economic strength or power as a result of the loss of wages and benefits of jobs, loss of purchasing power, loss of union check off dues, loss of production and stunting of gross national product, reduction in the payroll tax revenues of the state.

4. Trends on Graduate Output in Eastern Cape Institutions

The graduates output are those who successfully completed the relevant qualification during the period of January to December of the reference year. The proportion of the total output awarded to each institution is expressed in the graph below.

Figure 3: Graduate Output in Eastern Cape Institutions

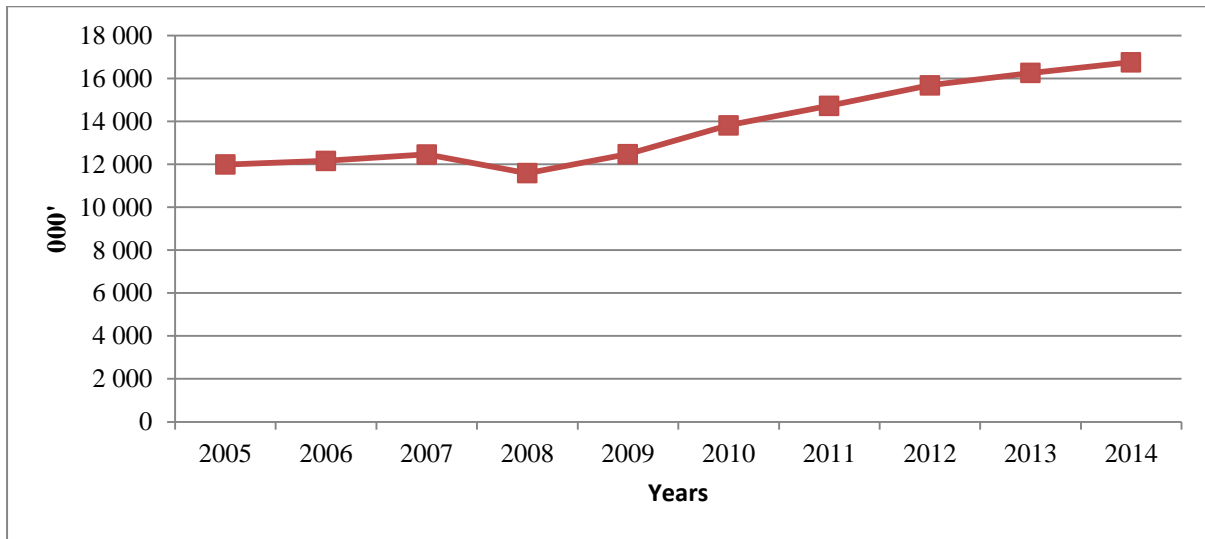


Source: CHE,2016

The above graph shows that WSU has had the highest graduate output of 85 percent increase from 2005 to 2014 in the Eastern Cape Province. This is followed by 78 percent increase of graduate output at the University of Fort Hare from 2005 to 2014. NMMU has experienced 16 percent graduate output within 10 years while Rhodes University has experienced a slight increase of 10percent.

In absolute terms, it can be noted that NMMU has achieved a high rate of graduate output from 2005(5446) to 2014 (6323) followed by WSU from 2005(2671) to 2014(4942). On the other hand, UFH had the lowest graduate output in 2005 (1791) however experienced a rapid increase by 2014 and became the 3rd highest graduate producer in the Eastern Cape (3187).

Figure 4: Overall of all Universities in EC



Source: Author's own computation

The Eastern Cape Universities have collectively achieved a 40 percent increase in graduate output from 2005 to 2014. This is a remarkable achievement these universities have achieved from almost a 10 year period. It does appear that there was a slight decrease of 7 percent between 2007 and 2008. This decline has strongly influenced the decline in graduate output from NMMU in 2008.

5. Research methodology

This study uses Engle and Granger cointegration techniques to test the above hypothesis. Cointegration analysis provides an adequate framework for estimating long-run equilibrium. Specific steps in the research methodology are outlined in the following sub-sections.

5.1 The Engle-Granger Error Correction Model

The Engle-Granger Model provides a reliable test for the long-run equilibrium in the variables. In the first step, all dynamics are ignored and the cointegration regression is estimated using Ordinary Least Squares (OLS) as follows:

$$C_t = \beta Y_t + u_t \dots \dots \dots (1)$$

In equation (1) above both C_t and Y_t are assumed to be nonstationary variables.

In order for C_t and Y_t to be cointegrated, the estimated residuals from Eq. (1) should be stationary (i.e. $u_t \sim I(0)$) and integrated in the order of one. If the variables in Eq. (1) are nonstationary the regression will be inadequate and spurious and therefore cannot be relied on Engle and Yoo (1991); Park and Phillips (1988); Phillips and Hansen (1990) and West (1987).

The second step of Engle and Granger cointegration is to estimate short-run dynamics of the error correction (ECM). If a true cointegration exists then there will be an error correction (ECM). On finding cointegration between C_t and Y_t , we obtain the estimate of β from Eq.(1), and insert it in place of β in the error-correction term $(C_t - \beta Y_t)$ as follows:

$$\Delta C_t = \alpha_1 \Delta Y_t + \alpha_2 (C_t - \beta Y_t)_{t-1} + \varepsilon_t \dots \dots \dots (2)$$

Where Δ represents first differences and ε_t is the error term

5.2 Model specification

In this paper we model graduate unemployment as a function of graduates as follows:

$$UNE_t = \beta_0 + \beta_1 G_{ufh} + \beta_2 G_{WSU} + \beta_3 G_{RU} + \beta_4 G_{NMMU} + \beta_5 GDP_{EC} + \varepsilon_t \dots \dots \dots (3)$$

Where:

G=Graduates

UFH=University of Fort Hare

WSU=Walter Sisulu University

RU=Rhodes University

NMMU=Nelson Mandela Metropolitan University

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ =Coefficients ε_t = Error term

The above equation is expressed as follows

$$GDP_{EC} = \beta_0 + \beta_1 G_{ufh} + \beta_2 G_{WSU} + \beta_3 G_{RU} + \beta_4 G_{NMMU} + \beta_5 UNE_{EC} \varepsilon_t \dots \dots \dots (4)$$

Where:

5.3 Estimation techniques

This paper will make use of Augmented Dickey-Fuller (ADF)

5.3.1 Unit root tests

The Augmented Dickey Fuller test is a stricter version of the Dickey Fuller (DF) test. The ADF test uses lagged values of the dependent variable Y_t the null hypothesis for the ADF test for a unit root is $\gamma=0$. the following regression is for ADF test:

$$y_t = \mu + \beta t + \gamma Y_{t-1} + \sum_{j=1}^p \gamma_j \Delta Y_{t-j} + \epsilon_t$$

The equation with no constant and no trend is represented by;

$$\Delta y_t = \gamma y_{t-1} + \sum_{i=2}^p \beta_i \Delta y_{t-1+i} + \epsilon_t \dots \dots \dots (4)$$

The equation with a constant and no trend is represented as:

$$\Delta y_t = a_0 + \gamma y_{t-1} + \sum_{i=2}^p \beta_i \Delta y_{t-1+i} + \epsilon_t \dots \dots \dots (5)$$

The equation with both a trend and a constant is given by:

$$\Delta y_t = a_0 + \gamma y_{t-1} + a_2 \sum_{i=2}^p \beta_i \Delta y_{t-1+i} + \epsilon_t \dots \dots \dots (6)$$

In these models:

$$\gamma = \gamma - (1 - \sum_{i=1}^p \alpha_i) \text{ and } \beta = - \sum_{i=1}^p \alpha_i$$

The ADF test corrects for high-order serial correlation by adding a lagged differenced term on the right-hand side in the DF equations. The null ($\gamma = 0$) and alternative hypothesis for the ADF test is the same as the DF test. In both tests, if the calculated statistic is less (in absolute terms) than the MacKinnon (1991, 1996) values, which are used by the E-views 5 software, the null hypothesis is accepted and will, therefore, mean that there is a unit root in the series. In other words, it means the time series is not stationary. The opposite is true when the calculated statistic is greater than the MacKinnon critical values. However, in this ADF equation the coefficient of interest is γ , if $\gamma = 0$, the equation is entirely in first difference

form and so has no unit root. If the coefficients of a difference equation sum up to 1, at least one characteristic root has unity. On the equations, if $\sum a_i = 1$, $\gamma = 0$ and the system has a unit root.

5.3.1.1 Unit test results

Table 1: Tests for stationarity

Augmented Dickey Fuller	
Variable	t-stat
YUE	-6.520779***
GDP	-4.965354***
NMMU	-5.657001***
UFH	-12.39399***
RU	-11.86579
WSU	-6.066896***

Significance level: ***(1%), **(5%), *(10)

Source Author's own computation

Augmented Dickey-Fuller (ADF) was conducted to test for stationarity for all the variables and tests showed that the first three variables were stationary after being first differenced and last three variables were stationary after second differenced such as UFH, RU, and WSU. The t-statistics are more than the critical values, we reject the null hypothesis and conclude that the model can be used to regress the results.

5.3.2 Test for cointegration

Based on the VAR model we tested for cointegration. The cointegration was conducted using Johansen method to determine whether there is a long run equilibrium relationship between the graduate unemployment and economic growth in the province. The results are shown below:

Table 2: Testing for cointegration (Series: UNE, GDP, G_{UFH}, G_{WSU}, G_{RU}, G_{NMMU})

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.636070	67.04308	95.75366	0.8130
At most 1	0.396555	40.76243	69.81889	0.9352
At most 2	0.359344	27.62982	47.85613	0.8293
At most 3	0.323367	16.05299	29.79707	0.7085
At most 4	0.193582	5.896702	15.49471	0.7077
At most 5	0.011575	0.302712	3.841466	0.5822

Trace test indicates no cointegration at the 0.05 level

** denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

The results of a Trace test show that there is no cointegration in the empirical model at 0.05 percent level

Table 3: Eigenvalue cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.636070	26.28065	40.07757	0.6833
At most 1	0.396555	13.13261	33.87687	0.9949
At most 2	0.359344	11.57683	27.58434	0.9484
At most 3	0.323367	10.15629	21.13162	0.7299
At most 4	0.193582	5.593990	14.26460	0.6657
At most 5	0.011575	0.302712	3.841466	0.5822

Max-eigenvalue test indicates no cointegration at the 0.05 level denotes rejection of the hypothesis at the 0.05 level*

***MacKinnon-Haug-Michelis (1999) p-values*

Using eigenvalues provides further evidence of the absence of cointegration between these variables in a long run. Since there is no evidence of cointegration, we did not run the vector error correction model.

5.3.3 Diagnostic test

The diagnostic tests are very important in this analysis. Diagnostic tests conducted include heteroscedasticity, normality test, and serial correlation.

Table 4: Diagnostic test

Test	F-test	P-value	Decision
Heteroscedasticity test: White	1.375032	0.2702	We reject the null hypothesis
Normality mean of squared residuals/ Jarque-Bera	0.262839	0.876850	
Breusch-Godfrey Serial Correlation LM Test	1.706435	0.2069	

Source: Author's own computation

According to the Breusch-Godfrey, the model is free from serial correlation. The p value is 0.1299 which is greater than 5 %, therefore there is no serial correlation.

The results show that the model used in this paper is robust. Having established that there is no cointegration between youth unemployment, economic growth, and graduates in the four institutions, it is important to check if there is a chance of a casual relationship. In order to achieve this, we conducted a Granger causality econometric procedure.

5.3.4 Granger causality

Granger causality is that a variable X Granger causes variable Y if Y can be better predicted using the histories of both x and y than it can be predicted using the history of Y alone.

Table: Pairwise Granger causality tests

Null Hypothesis	Obs	F-statistics	Probability
UFH does not cause YUE YUE does not Granger Cause UFH	26	1.95657 0.37959	0.1663 0.6887
WSU does not cause YUE YUE does not Granger Cause WSU	26	0.75780 0.17697	0.4811 0.8390
NMMU does not cause YUE YUE does not Granger Cause NMMU	26	2.59059 0.05907	0.0987 0.9428
RU does not cause YUE YUE does not Granger Cause RU	26	1.88249 1.04014	0.1770 0.3709
GDP does not Granger Cause YUE YUE does not Granger Cause GDP	26	1.26881 0.50119	0.3019 0.6129
WSU does not Granger Cause UFH UFH does not Granger Cause WSU	26	0.15969 1.03387	0.8534 0.3730
NMMU does not Granger Cause UFH UFH does not Granger Cause NMMU	26	0.56032 0.27442	0.5793 0.7627
RU does not Granger Cause UFH UFH does not Granger Cause RU	26	0.47820 0.17435	0.6265 0.8412
GDP does not Granger Cause UFH UFH does not Granger Cause GDP	26	0.01732 0.10167	0.9828 0.9038
NMMU does not Granger Cause WS WSU does not Granger Cause NMMU	26	0.78612 0.75943	0.4686 0.4804
RU does not Granger Cause WSU WSU does not Granger Cause RU	26	0.66665 0.14590	0.5240 0.8651
GDP does not Granger Cause WSU WSU does not Granger Cause GDP	26	1.72370 0.14120	0.2027 0.8691

RU does not Granger Cause NMMU NMMU does not Granger Cause RU	26	1.46262 0.12686	0.2543 0.8815
GDP does not Granger Cause NMMU NMMU does not Granger Cause GDP	26	0.30691 0.06768	0.7390 0.9348
GDP does not Granger Cause RU RU does not Granger Cause GDP	26	0.12337 0.24695	0.8846 0.7834

Source: Author's own computation

The results in the table above show that universities do not Granger cause youth unemployment, GDP, and youth employment does not ganger cause GDP in the Eastern Cape Province. This means that graduates produced by universities and GDP cannot be used to predict graduate unemployment in the province. Based on this finding, it can be concluded that graduates from Eastern Cape Universities have no/ little contribution to the GDP of the province.

6. Implication of the findings, conclusions, and recommendation

Eastern Cape is characterized as one of the disadvantaged provinces. A large section of the youth population is experiencing a high rate of unemployment. This led the graduates of the Eastern Cape Province to seek employment in other provinces. The main objective of this paper was to determine levels of graduates in the province and assess the graduate's contribution on the economic growth of the province. Our main argument is based on the fact that the institutions in the province produce a large number of graduates, yet there is still a high rate of unemployment. This could be the province's private and public sector does not cater for all the field of studies that are produced from the institutions or there is no enough capacity to absorb the graduate output.

The government, private sectors and universities in the province need a solution for this challenge because unemployment generates social unrest in the communities. Given skill biased technological change, a better educated and more highly skilled workforce is pressing long temporality before entering the market. The government, private sectors and universities

working together can achieve a lot in trying to tackle the main causes of graduate unemployment by identifying the gaps between universities and required skills in the labour market.

The main objective of the paper was to determine levels of graduates in the province and assess the graduate's contribution to the economic growth of the province. The thrust of the argument is whether or the Eastern Cape province carter for the graduates. Our argument is based on the fact that many graduates are unemployed and others seek jobs in other provinces in order to better their lives. Therefore, we can conclude that Eastern Cape graduates contribute to other provinces economic growth. The analysis results confirmed that there is no relationship between graduates unemployment and economic growth. The Eastern Cape's economic growth is among the lowest as compared to other provinces, although the low rate has many exploratory factors it is difficult to avoid the conclusion that a lack of capacity or jobs with the province is one of them.

Businesses must also come to the party to tackle the problem of the graduate's unemployment. The provincial departments and businesses should consider allowing unemployed graduates to make copies of curriculum vitae and qualification certificates, in order to apply for the jobs.

The graduates should also be willing to venture into self-employment and begin to view self-employment as an option for employment than being dependent on formal employment. The government should promote self-employment through education curriculum teach an entrepreneurship spirit and skills in the graduates.

The youth service programmes should be strengthened, there should be new community-based programmes that will enhance people's life skills, and broaden their opportunities to participate in community development programmes. Such programs should not be limited to urban areas but should spread in rural communities where most of these graduates reside.

There is a need for an inclusive economic growth that is sustainable. This could be realised through :

- Improved curriculum: it can be argued that the education system fails to prepare young people for the world of work. Thus, tertiary qualification does not guarantee employment. There is a need for curriculum renewal so that, what is taught today matches what is required in the market.
- The gap on the transition from University to finding a job should be reduced through placement on vocational jobs and for a period of three months. This can be achieved through a memorandum of understanding between the University and the corporate companies.

The Eastern Cape province has natural endowments, therefore, the government should try to attract foreign investment by promoting economic growth in order to create more jobs.

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