

**IS MATHEMATICAL LITERACY DETRIMENTAL TO BLACK YOUTH
EMPLOYMENT?**

By

Gabisile Sithole

THESIS

Submitted to

KDI School of Public Policy and Management

In partial fulfilment of the requirements

For the degree of

MASTER OF DEVELOPMENT POLICY

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ABSTRACT

IS MATHEMATICAL LITERACY DETRIMENTAL TO BLACK YOUTH EMPLOYMENT?

By

Gabisile Sithole

Youth unemployment, particularly among the Black youth in the age cohort, 15 to 24 years, is relatively high compared to their White, Coloured and India/Asian counterparts in the Gauteng province. The study investigates whether the subject, Mathematics Literacy (Maths Literacy), undermines the Black youth's employment prospects. The study aims to highlight that the youth's choice to study Maths Literacy over Core Mathematics (Maths) places them at a disadvantage when seeking decent employment and or to get admitted into key courses at university. The study uses data that was collected using the two questionnaires, which were intended to gain the Black youth's high school subject choices and grades, perceptions and employers recruiting requirements. A logit regression is applied to analyse and illustrate that for every one unit change in the Black youth's grade in Maths Literacy, the log odds of

unemployment increase by 1.379. Indeed, supporting the objective of the study that Maths Literacy undermines the Black youth's employment prospects, therefore contributing to rising youth unemployment.

DEDICATION

I would like to dedicate this study to my family, my fellow Black African youth in the Townships, where I come from and to the South Africa Department of Basic Education (DBE). I trust that this study will inspire more of my fellow Black African youth (particularly those from disadvantaged background) not to take irrelevant subjects such as Maths Literacy for the sake of passing their MATRIC. I hope that they will strive to pick up Maths in high school no matter how difficult it is as they can learn a lot from the subject improve their critical thinking and also afford them opportunities to get work opportunities such as Learnership, Apprenticeship, internships both in the private and public sector. DBE has a responsibility to teach and guide children and the youth on the relevant subjects. It thus important for the department to invest in teachers to teach the youth the relevant subjects such as Maths that will build their critical thinking and assist them to get into university and also secure work opportunities.

ACKNOWLEDGEMENT

This study is completed and I have so many important people to thank for its completion. First, I want to express my gratitude to my brilliant, intelligent and inspirational professors: Professor Jeong Hyeok and Professor SJ Paik for believing in me. I am grateful to my professors for their patience and guidance on this journey to produce this study. From the bottom of my heart – Gamsahamnida! I also want to thank the wonderful Mum Sphiwe, Mum Nozi, Baba Sphiwe Ngcobo, ZamaNgcobo, Lwazi, Refiloe, Lesedi, Msimelelo Ndlovu and the rest of the Ngcobo and Sithole families for all their help. Thank you for loving me through every moment in my life and pushing me to be my best at all times. God bless you all!

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LIST OF ABBREVIATIONS

CME	Concerned Maths Educators
DBE	Department of Basic Education
DOE	Department of Education
NDP	National Development Plan
NT	National Treasury
NYDA	National Youth Development Agency
SSETA	Services Sector Education and Training Authority
STATSSA	Statistics South Africa

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I. INTRODUCTION

Since 2004, there have been growing concerns from universities, private sector and civil society at large on the increasing rate of learners who are choosing to take Maths Literacy over Maths in high school. Maths Literacy is a new subject¹ that learners can choose as an areas of study to develop their wealth of knowledge between Grade 10 and 12. Maths Literacy aims to address and improve the country's low numerical proficiencies, which is more apparent among Black and Coloured people. A significant number of young Black South Africans lag behind their White, India/Asian and Coloured counterparts in terms of fundamental numerical and technical proficiencies. This is observed to be a result of a combination of two major issues, stemming from (i) the past Apartheid system including the Bantu Educational Act which was purposely designed to oppress Black people educationally, economically, socially and financially while offering White people the best of everything, and (ii) the recent developments in the educational system aiming to improve learners mathematical and analytical proficiencies.

According to the Department of Basic Education (DBE), Maths Literacy is a new subject with the intention to aid learners to apply mathematical concepts to everyday situations, become financially responsible and mathematically literate in their adulthood (Bansilal, Mkhwanazi & Mahlabela, 2012). Maths Literacy, to a large, is deemed as a new subject which is much easier, simpler and workable when compared to Maths, which for most non English speaking individually, is abstract, too technical and difficult to understand and do. In efforts to assist

¹ According to DBE, a subject is 'a specific body of academic knowledge' where 'knowledge integrates theory, proficiencies and values' (DOE, 2003c, p. 6). In this study the author refers to a subject as a particular area of study and development that high schools offer to learners, for instance Mathematics (Maths) or Mathematical Literacy (Maths Literacy), Computer studies, Physical Science, English and Accounting.

learners who have been struggling to pass Maths and progress to the next Grades, the government and DBE introduced Maths Literacy as a compulsory alternative subject to Maths. Since the introduction of Maths Literacy, over 40 percent of learners, mainly Black and Coloured, between 2008 and 2011, have been opting to take the “less demanding, easier and a safer” subject over Maths.

While government and teachers point to Maths Literacy as an alternative subject and platform for learners and the youth to develop fundamental mathematical and technical competencies; critics have raised a concern that Maths Literacy further exacerbates the prevailing issue of low numerical and technical proficiencies in the country, instead of resolving it. It appears strongly that, with Maths Literacy, young individuals, particularly those in the ages 15 to 24 years, remain to be innumerate, lacking fundamental mathematical and analytical competencies. Without these vital proficiencies, most of these young individuals struggle to transit from school into the labour market. Even with educational progression and increasing Matric pass rates, young Black individuals in the above age cohort, still find it difficult to: secure decent employment or get admitted into various courses at universities. This according to critics is the effect of Maths Literacy, which has been driven by DBE and schools, in isolation from the labour market and academia, onto learners and the youth with the anticipation that the subject will aid in the development of much needed mathematical proficiencies, and boost Matric (Grade 12) pass rate. Educational Expert and Economist Nicholas Spaul further states that Maths Literacy has shown more serious negative outcomes than what the subject was intended for. Learners who studied the subject are reported to face very limited labour market prospects compared to those that studied Maths. This will continue unless core challenges are addressed in

a logical manner with the aim to invest in the youth to be able to be competitive in the labour market and thus find employment.

Critics in support of Maths Literacy hold the view that the subject has potential to develop mathematical competencies among the youth, and as such the youth in general should lean more towards the subject and not so much on Maths. Contrary to this, is another argument calling for the abolishment of this subject and reinstate Maths as it were in the past. This emanates from the view that Maths Literacy undermines the youth's employment and higher educational prospects in the country. Currently, a number of the Black youth who have and continues to study Maths Literary are neither working nor in training or studying towards any qualifications at universities or colleges. The study, therefore, draws its research objective from the above conflicting views and seeks to use data collected from 501 respondents to conduct an investigation on whether Maths Literacy is associated with the unemployed Black youth, taking to consideration the competencies that the Black youth have over the time developed through Maths Literacy.

The study will structured to provide the literature review on the background on the dynamics of youth unemployment in South Africa; followed, highlight the reasons behind Maths Literacy as a policy of choice amid mathematical and technical skills shortages in the country. The study will also apply the logistic model analysis to determine the link between Maths Literacy and the employment status of the Black youths, taking inconsideration their years of schooling, choice of Maths or Mathematics Literacy and the result attained in their latest Grade in high school; weighted average computer literacy; and unemployment duration in months.

Fourth, the study will provide the empirical results of the logistic analysis. Lastly, the final section will provide conclusions from the investigation and recommendations, with the aim to suggest policy changes on subjects that should be offered by DBE and selected also by the youth in preparation for universities and the labour market. Thus, the study seeks to answer the following research questions:

Research objectives and questions

1. What is Maths Literacy in South Africa? Why is Maths Literacy a rising concern in the country?
2. Does Maths Literacy undermine the Black youth's employment, and overall skills development prospects in the country?
3. Should Maths Literacy be abolished in South Africa? What will be policy implications of this in terms of the Black youth's skills developments, educational and development skills and training sector at large?
4. What are the key competencies that the Black youth should aspire to have? Why is it important for the youth in general to develop these competencies?

II. LITERATURE REVIEW

Youth unemployment dynamics in South Africa

According to the World Bank, youth unemployment² in South Africa has been over 50 percent, since 1996. In 2011, the National Treasury (NT) further asserted that 1 in 8 young adult under the age of 25 years has a job compared to 40% in other emerging economies. This has gradually become an economic, political and social challenge, which according to employers has been driven by the youth's lack of experience, lack of technical, mathematical and analytical competencies (hard skills) as well as lack of workplace competencies (soft skills). The Black youth in particular has been greatly affected by this, having difficulty to secure work opportunities, get admitted into most of the key courses at universities, reach economic and financial freedom to improve their human capital and health development, while their White, Indian/Asian and Coloured counterparts are likely to be better off. The Black youth has been reported to be discouraged, frustrated and angry as most of them struggle to realise their main obstacles to securing decent employment.

Several researchers have examined the different causes of youth unemployment and the various methods that can be undertaken to empower and increase the youth's prospects into the labour market. Studies by Wolpin in 1987, Dolton in 1994, Vernières in 1997, Giret and Ryan in 2001, Matsheni and Rospabe in 2002 express the views on that low education attainment and work experience play a significant role in the youth's prospects to finding employment in the future. These studies further raise that, in the case of the youth, the less the number years of

² Youth between the ages, 15 to 24 years

schooling and or working experience the more difficult it is for them to secure employment when compared to adults with similar educational attainment or levels of experience.

Other studies also raised that macroeconomic factors contribute significantly to youth unemployment. According to Freeman and Wise in 1982, Blanchflower and Freeman in 1999, O'Higgins in 2001 and du Toit in 2003, youth wages, the size of the youth labour force and the lack of proficiencies among the youth adds to their struggles in finding employment. O'Higgins in 2001, also raises the view that the changes in aggregate demand have significant impact on the youth, compared to adults, which in turn contributes to their unemployment. During a recession or major recruitment changes, companies or employers who are mostly concerned about their profit margins, tend to retrench the youth workers first before adult workers. The youth becomes the easier option as they are found be much cheaper to lay off, as in most cases, have the least work experience, leaving the least impacts on organisational productivity and operations.

Youth unemployment and proficiencies mismatch

Bhorat and Hodge in 1999, Poswell in 2002, Bhorat in 2004, Cassim in 2006, Naidoo in 2006 and Statistics South Africa (STATSSA) in 2015, raise the issue that the most common cause of unemployment in the country is due to “proficiencies mismatch”, existing between the supply of and demand for labour. Proficiencies mismatch is said to affect not only the adults but also the youth in the country. This has been the challenge since South Africa's decisions in 1995 to reintegrate with global economies driven by technological and capital intensive operations, and highly skilled labour inputs, which the country falls short off. With the new economic

structural demands, the country needed a different set of skills, technical and workplace proficiencies, to replace the former, which consisted of low and semi-skilled workers who are mostly Black people. This is still struggle for the youth seeking employment and or to get admitted into numerous courses at university, due to their poor educational attributes and competencies.

What is Maths Literacy in South Africa?

According to a study conducted by Christiansen in 2004, the South African National Curriculum Statement (NCS) raised the point that the aim for Maths Literacy is to provide learners with awareness and understanding of the role that mathematics plays in modern, However, the study found that the learners engagements with complex applications of mathematics implied by the NCS were not on par with the objective of Maths Literacy and to address mathematical skills challenges in the country. The vision of Maths Literacy is noted to be driven by myths of mathematics use to everyday life practices, while in the curriculum it is organised around mathematics - which in most instances is not used in everyday practices. As a result, learners are disempowered as they are not been taught and trained well in the relevant areas to develop sufficient base knowledge to make the necessary connections between the mathematical, technological as well reflective knowledge, understanding and competencies to facilitate awareness in everyday practices. Speaking during an interview on News 24 Live in January 2014, Educational Expert and Economist, Nicholas Spauls, raised a concern in that Maths Literacy falls short in providing learners with the fundamental knowledge and competencies to enable them to perform optimally in the working environment. Therefore,

employers and universities shy away from employing youth, especially those that have studied Maths Literacy, as they will most likely take longer than anticipated to learn on the job, require extra training which will be costly, and also need maximum supervision as they are working from a zero technical, mathematical and critical ad practical competencies base.

A case in point for the Concerned Maths Educators' (CME) group is that Maths literacy lacks to advance the youth's intellectual capacity to be mathematically literate. Maths Literacy, as introduced by the DBE, is very limited in its design scope as it focus on a teaching style that will only enable creative and logical reasoning about problems in Mathematics itself', which 'leads to theories of abstract relations' (Department of Education, DOE 2003c, p. 9). Based on its content design, Maths Literacy is said to takes away the opportunity for the youth to learn crucial mathematical strategies and thinking techniques which develop definite competencies that are required in working environments. In view of this, the youth remain at disadvantage and as a result fall short when competing with others, who have studied Maths and have the required mathematical and critical thinking foundation, to secure work opportunities. This, in the current phase of youth unemployment, is the major challenge facing the Black youth, who opted to study Maths Literacy over Maths. While attempts have been made by DBE and the government to drive Maths Literacy, CME still points to the concern that both the teachers and youth in South Africa are not yet ready to have other forms or an alternative to Maths. Amid the prevailing skills and competencies shortages among the youth and teaching staff shortages, Maths Literacy aggravates these challenges, holding the youth development process hostage, instead of taking it forward.

Significance of Maths over Maths Literacy

South Africa, its people, institutions and the economy today operates in a complex, very technologically, capital intensive and competitively inclined working environment, which requires advanced and very adaptive skills. CME states that adaptive reasoning is the most important aspect of Maths, and in studying the subject, the youth stands to acquire useful practises and algebraic theories and models, strengthening critical thinking, reasoning, analysing and problem solving competencies, which can be applied in different work environments and courses at universities. With Maths, the youth develop a skill foundation which opens several higher educational opportunities at universities leading to the respective professions could be attained. Table 1 below, provides an indication of various professional opportunities that the youth could explore with Maths.

Christiansen in 2008, further states that Maths can be a powerful modelling tool, and from the foundation of modelling, learners and youth at large develop an understanding and knowledge base which they can utilise going forward to make connection and analyse situations differently from when we did not have the subject knowledge. Moreover, statistical models, which is a branch of Maths, also provides the youth with the tools to use to indicate the extent to which two factors can be observed to be correlated or linked. This is better facilitated with computer literacy and technology.

Table 1: People with Maths degrees or degrees that required Maths as a subject in High School

Persons with Maths degrees or degrees that require Maths from high school are in demand in the following places:	Job titles commonly held by High School Maths graduates
Accounting firms	Accountant
Actuarial firms	Actuary
Airlines and other transportation companies	Auditor
Banks and other financial institutions	Banker
Chemical and pharmaceutical manufacturers	Biostatistician
Computer manufacturers	Budget Analyst
Consulting firms	Cartographer
Educational institutions	Compensation/Benefits Specialist
Engineering firms	Computer Applications Specialist
Government agencies	Computer Programmer
Health services	Computer Systems Analyst
Insurance agencies	Credit Analyst
Insurance companies	Cryptographer
Investment firms	Data Analyst
Real estate firms	Data Base Manager
Research and development firms	Data Processing Manager
Securities firms	Economic Analyst
Software development firms	Engineer (Chemical, Civil, Electrical as well as Mechanical)
Technical publishing firms	Financial Analyst
Telecommunications companies	Financial Consultant
Textbook publishing companies	Financial Manager
Utility companies	Financial Services Sales Representative
In government, education, manufacturing, and service industries of many kinds, math majors get good jobs.	Information Systems Analyst
	Insurance Agent
	Insurance Underwriter
	Inventory Control Specialist
	Investment Manager
	Loan Counselor/Officer
	Market Research Analyst
	Meteorologist
	Operations Research Analyst
	Pilot
	Production Planner
	Professor
	Psychometrician
	Purchasing Manager
	Real Estate Appraiser
	Risk Manager
	Securities Analyst
	Statistician
	Surveyor
	Teacher
	Traffic Technician
	Urban Planner

Computer literacy is the level of understanding and awareness of basic hardware, for example computers, laptops; and software, such as the internet, concepts that allows individuals or collectives (be it learners, workers) to use for word processing, data entry, spreadsheets and electronic communication, for instance sending emails. In the modern working and learning environment, most private sector companies and government Departments, have openly stated that computer literacy is important job seekers, be it learners or adults. In the NT for instance, workers both adult as well as the youth (interns) are all required to be computer literate so to be able to use computer technologies. Similarly, at Wits University, the various departments have openly requested that students to improve on their computer literacy, so to prepare students for various course submissions – which require that submissions be prepared electronically, in a specific format. Computer literacy applies to most professional positions, including entry level positions for youth. Basic understanding of how to use software such as Microsoft Suite in particular, has over the years become the base requirements for workers who are working on basis in a professional office environment, communicating with other colleagues in a form of an email (outlook), writing letters (word documents), sending inputs either calculations (excel) or documents, or has to present anything ideas or products. For effective presentation, convenience for communication, Microsoft presentation in most common basic requirement that potential employees are expected to have.

Most Black schools in the townships and informal settlements, rural areas do not offer computer studies, literacy or technology. This is the case at both primary and high school levels. There are instances where Black learners recently have completed high school, but have never seen, used and learnt about computers, how they work, why they are used or even how they are

used. For those who had opportunities to attend university, colleges or get a job straight after school, found work or school difficult as they were expected to have some basic knowledge of computer literacy, but in actual fact, had no base knowledge or practical experience unlike their White, Coloured and India/Asian counterparts. Although this presented both an advantage and disadvantage for the Black youth, the latter found to be more prominent among this youth and as a result they failed to overcome their challenge and thus also failed to perform appropriately. Even now, the manner which some of the Black youth perceive their skill shortages as “a stumbling block”, rather than “an opportunity to catch up” with their counterparts, continues to negatively affect their efforts currently to secure decent work.

According to Mbonani and Bansilal in 2014, ideally, schools should develop the foundation for almost all the fundamental technical and non-technical skills. However, in some cases, in the Black schools or communities particularly, schools are unable to lay these foundational skills, and still permit a significant number of the Black youth to proceed to next Grades and complete high school without sufficient practical and non - practical knowledge and skills, of which universities and the working environment expects them to already have. As such, the Black youth pursue to find employment or to get admitted into universities already at the back foot. Through various assessments during the recruitment or application process, the Black youth fall short to demonstrate their hard and soft competencies, and to bid for and secure what they want due to the above challenges. Currently, the Black youth, specifically those who have studied Maths Literacy, face the very same challenge when compared to those who have studied Maths.

Thus, this study seeks to contribute to the literature on youth unemployment by showing, one, that youth unemployment in the country is not proportionally distributed among the Black, White, Coloured, and Indian/Asian races. Secondly, subject choices in high school, which are meant to develop certain competencies, have a significant contribution towards the youth's employment opportunities in the labour market and entry admissions prospects at universities. The study also probed, in the employers' questionnaire, to establish other competencies that are deemed critical, especially in the event where the youth, who generally do not have any work experience. In realising that there are other critical competencies that the labour market deems important, the study therefore sought to further contribute to the issue of unemployment by highlighting that the rising unemployment rates among the Black youth in Black communities should be considered and addressed critically as an issue that is sustained through poor quality of education and subject choices, for instance Maths Literature, which in turn undermines their developments in the future to increase their higher education attainments, human capital, employment prospects to achieve economic freedom.

The study, therefore, attempts to demonstrate the view depicted below that:

$$\textit{Employment prospects} \downarrow = \textit{Maths Literacy} + \textit{Computer Literacy} + \textit{Years of schooling} + \textit{Age} \\ + \textit{Unemployment duration}$$

Which in the current reality in the country, Black youth should aspire towards:

$$\textit{Employment prospects} \uparrow = \textit{Maths} + \textit{Years of schooling} + \textit{Computer Literacy} + \textit{Age} \\ - \textit{Unemployment duration}$$

III. METHODOLOGY

The study aims to investigate the issue of Black African youth's employment status, where an employed individual is denoted as 1 and unemployed individual is denoted as 0, focusing on the youth's subject choices of Maths or Mathematics Literacy and the respective Grade attained in high school; individuals' weighted average Computer Literacy, Unemployment Duration and Years of schooling that they have on the odds of being employment. To gain insight on this issue, the study calculated a few variables to use in a logit model to support its research on youth unemployment.

The data set had a binary response (outcome, dependent) variable called employed. There are five predictor variables: DML, rank of Grade attained for Maths Literacy, Computer Literacy, Unemployment Duration and Years of schooling. The study created a dummy variable, DML, indicating 1 if an individual took Maths Literacy and 0 if the individual studied Math.

The weighted average computer literacy variable was calculated using the individuals' personal rating of their knowledge on the Microsoft functions (Ms Word, Ms Excel, Ms PowerPoint, Ms Outlook) and Internet Explorer which are used generally by most hiring institutions in Gauteng. Individuals were requested in the survey to rate themselves per function by indication (1 representing Good which adds up to 60 points, 2 representing Fair which adds up to 30 points and 3 representing Poor which adds up to 10 points). Each individual used the point systems created above to rate themselves per Microsoft function and Internet Explorer. Each individual's weighted average computer literacy was calculated by adding up the

individual's points from each function then divided by 5. The years of schooling and unemployment duration are both provided in the actual values as provided by the Black African youth in years.

The logit model is preferred as the study aims to model dichotomous outcome variables, using a small data set. The logit model provides the log odds of the outcome that is modeled as a linear combination of the 5 predictor variables. Therefore, the objective is to estimate the log odds of an individual being employed as result of their subject choice of Maths Literacy with the respective to the other predictor variables. The log odds of an individual being employed are also influenced by other demographic and socioeconomic characteristics. The study will estimate these log odds guided by Stock & Watson concept on logit model:

$$\Pr(Y = 1 | X_1, X_2, X_3, X_4, X_5) = F^3(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5)$$

$$\Pr(Y = 1 | X_1, X_2, X_3, X_4, X_5) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5)}}$$

$$\Pr(Y = 1 | X_1, X_2, X_3, X_4, X_5) = \frac{1}{\left(1 + e^{(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5)} \right)}$$

Y is the outcome of interest, employed individual. β_0 is and β_1 to β_5 are the coefficients for the predictor variables. X_1 to X_5 are. The study opts to use Maths Literacy as it is a debate currently in South Africa as most of the unemployed youth were misinformed in high school to choose

³ Represents a Cumulative standard logistic distribution

Maths Literacy over Maths as it is an easier alternative choice for learners to do. Most of the unemployed youth have Maths Literacy and some of them cannot further their studies at universities or get learnerships or other training work as university and most employers prefer individuals who have Maths than those who have Mathematics Literacy.

IV. DATA ANALYSIS AND DESCRIPTIVE STATISTICS

PRESENTATION OF FINDINGS

The results of the study indicate that, the mean of employed youth affects mostly those that are 22 year of age. The study, further indicates that the youth is also noted to have attained about 13 years of schooling, which is in line with the South African basic education schooling system intended for the youth to spend in school, from primary to high school system. The data further indicates that the average time that the youth has gone long for, without a job, is about a year and 6 moths. Although the youth has attained the minimum years of basic schooling, finding work remains a challenge that is taking them years to overcome. The youth's weighted average for computer literacy demonstrate that the youth have on an average, about 30% knowledge of computers. See table 2 below for the summary of the descriptive statistic of the respondents.

Table 2: Descriptive statistics

Variable	Observations	Mean	Standard deviation	Min	Max
Age	501	21.93413	1.688091	17	24
Years of schooling	501	12.56687	1.475812	8	18
Computer Literacy	501	29.38124	21.37382	0	60
Unemployment duration	501	1.602794	1.095405	0	6

Source: Author's data collected through questionnaires

With regards to Table 3 below, the results for the gender and employment status of the youth indicates that the majority of the youth (56 %) comprised of females, followed by 44 % of the youth who are males. Of the female respondents in the study, 59% of them were unemployed compared to their male counterparts. Overall, the results also shows that only 33% (165 individuals) of the youth were employed, compared to the 67% (336 individuals) who were unemployed

and are searching for work opportunities to participate in economic activities and improve their livelihoods. These results, further affirm the views of several researchers who have alluded that unemployment affects females generally compared to their male counterparts.

Table 3. Gender and Employment Status

Employment Status	Gender		Total
	Male	Female	
Unemployed	138	198	336
Employed	83	82	165
Total	221	280	501

Source: Author's data collected through questionnaires

For the youth who studied Maths Literacy instead of Maths in high school, it appear that most of the youth in this category face a lower chances of 10% of being employed compared to the youth who had taken Maths, who have estimated 45% chance of being employed. This, to some extent, contributes to the concern of the study in that Maths Literacy could have a negative influence on the youth's employment prospects in the country. This despite the indications that youth who have attained a score of a (B (70-79%)) or level 2, for Maths Literacy, having a 50% being employed. Table 3 below, shows the predicted probability of employment at each level of the grades attained for Maths Literacy, holding all other variables in the model at their means. Table 4 illustrates that individuals with (B (70-79%)), have the highest chance of being employed compared to the other individuals who have attained other for Maths Literacy.

Table 4: Grades attained for Maths Literacy by the employed and unemployed youth

Grade ML x DML	Employment status		Total	Chance of employment
	Unemployed	Employed		
0	187	148	335	44%
2	2	2	4	50%
3	20	2	22	9%
4	50	8	58	14%
5	50	4	54	7%
6	26	1	27	4%
7	1	0	1	0%
<i>Total</i>	<i>336</i>	<i>165</i>	<i>501</i>	

Source: Author's data collected through questionnaires

Referring to table 5 below, it appears that a significant portion of the youth aged between 20 to 24 years face difficulties in finding employment compare to the youth below 20 years of age. This could be that the youth between the ages 15, which the legal age to get a job, and 19 are still in school and as a result are not looking for work. Although, the youth in the age cohort of 20 to 24 are mostly unemployed, the data also shows that they still stand better chances of gaining employment compared to the younger cohorts. This is the case particularly with the youth who are 24 years of age, having the highest chance of being employed compared to the other age groups especially those who are below 19 years of age.

Table 5: Youth unemployment status according to age of the youth

Age	Employment status		Total	Chance of employment
	0 Unemployed	1 Employed		
17	1	0	1	0%
18	8	0	8	0%
19	34	4	38	11%
20	51	19	70	27%
21	64	16	80	20%
22	61	22	83	27%
23	58	46	104	44%
24	59	58	117	50%
<i>Total</i>	<i>336</i>	<i>165</i>	<i>501</i>	

Source: Author's data collected through questionnaires

The data analysis indicates that the majority of the youth respondents in this study (70 %) have the desire to work as employees, while a disappointing 23% indicates those that have a desire to become entrepreneurs and lead their own businesses, and potentially employ their counterparts. This illustration further provides interesting views of the youth in that, even if the government had to increase initiatives and provisions to support youth led business opportunities and initiatives, only the 23% of the youth who will be driving initiatives to provide solutions to improve and take the youth forward. Moreover, with the 70% of the youth that have indicated their desire towards working for companies, state owned enterprises and government, signals a need for further work in developing the youth in terms of education and training so as to improve their rate of employability and competencies and ensure that they are absorbed by the labour market.

Table 6: Youth’s desire to work either as an employee or self-employed individual

Self-employment	115	23%
Self-employment at later stage	16	3%
Employee	349	70%
Employee and self-employment	19	4%
Indifferent	2	0%
	501	100%

While the Black youth is of the view that they lack of support from the government in order develop and improve their skills; providing job readiness training and accessing funding for business and or entrepreneurship development, it is rather concerning that only 44.5% of the youth respondents know of the NYDA, and its intended objective to support and increase youth development initiatives. The NYDA branch offices are positioned in almost every youth

development centre in the townships in Ekurhuleni, Soweto, Katlehong, Atteridgeville and Alexandra to assist the youth with various employment, training and business development. With over half of this youth being oblivious to key institutions, such as the NYDA, it apparent that there be a need for a paradigm shift in the youth's perceptions on agents that are responsible for their development. The NYDA was established to only serve, empower and foster youth development in the country. In the event that the youth's engagement as well as the perception on the NYDA remains low, the NYDA may cease to exist like Umsobomvu, which was the first attempt by the government to assist the youth on its development trajectory.

V. RESULTS

The data set has a binary response (outcome, dependent) variable called employment status, where an employed individual is coded as 1 and unemployed individual is coded as 0. There are five predictor variables: 1) a dummy variable of an individual's indication of Maths Literacy attainment in high school 2) individual's weighted average computer literacy individual's; 3) years of schooling; 4) individual's unemployment duration in years; and 5) individual's age, based on the range of (15 to 24 years).

The study treats the variables individual's age, years of schooling; individual's weighted average computer literacy; individual's unemployment duration in years as continuous variables. While the dummy variable of an individual's indication of whether or not they took Maths Literacy is treated as categorical. The study employs a logistic regression to predict the outcome variable unemployment status, using the five predictor variables. The study created a dummy variable of the individuals who have attained Mathematics Literacy over Maths in high school. From the dummy variable the study further created an interactive variable called individual's Maths and the result attained in their last Grade in high school.

The simple logistic model has the form:

$$y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \dots \dots \dots (1)$$

Table 7: Determinants of employment: Multiple regressors including Maths Literacy, Computer Literacy, Years of Schooling, Unemployment Duration and Age

	Employed	Employed	Employed	Employed	Employed
Maths Literacy	-1.937 (6.95)**	-1.603 (5.43)**	-1.444 (4.85)**	-1.505 (5.01)**	-1.379 (4.53)**
Computer Literacy		0.049 (8.44)**	0.037 (5.72)**	0.036 (5.55)**	0.035 (5.28)**
Years of schooling			0.34 (3.65)**	0.300 (3.12)**	0.247 (2.52)*
Unemployment duration				-0.315 (2.56)*	-0.410 (3.16)**
Age					0.221 (2.85)**
_cons	-0.234 (2.13)*	-1.952 (7.91)**	-5.932 (5.23)**	-4.875 (4.03)**	-8.908 (4.70)**
R	0.1031	0.2395	0.2623	0.2736	0.2867
N	501	501	501	501	501
* p<0.05; ** p<0.01					

Overall, the logistic regressions results, supports the research objectives on that Maths Literacy is detrimental to the Black youth's employment and development prospects. Firstly, the results shows that for a one unit change in Maths Literacy, the log odds for the Black youth to being employed decrease by 1.379. This is in line with Educational Expert and Economist Spaul on that the youth who have studied Maths Literacy find it very challenging to secure decent employment or get hired by various companies in the private sector as the subject falls short in teaching, developing and advancing the youth's critical thinking, analytical and mathematical skills, which are useful in the modern working environment. The youth also struggle to get admitted into universities, such as Wits, Stellenbosch and UCT as these institutions do not accept

the subject for key courses in Engineering, Architecture, Medical, Finance, Investment, ICT, Accounting, Economics, Econometrics and Sciences.

The results further shows that for a one unit increase in the Black learner's computer literacy or proficiency, the log odds of being employed increases by 0.035. This corresponds with the ongoing views from most employers (Investec, National Treasury etc) in that basic computer literacy or proficiency is an added advantage for the youth seeking to find a professional job and or study at university or college. Basic computer proficiency, which provides different working tools: emails, word processing, spreadsheets, search engines, presentation and display platform, is believed to enable the youth to undertake, present, engage and find solutions to various tasks, activities, and projects in the work environment as well as universities or colleges. With basic computer literacy or proficiency, the youth is exposed into a highly developing ICT sector and industry, which cuts through almost all sectors. To date, there are a significant number of Black learners who have not seen, touch or used a computer. In seeking employment opportunities in the modern work environment, the Black youth could consider developing computer literacy to be able to communicate, prepare and deliver on various tasks and functions.

In terms of the Black youth's schooling framework, the results indicates that for every unit change in years of schooling for the Black youth, the log odds of being employed increase by 0.247. While it is important for the Black youth to choose relevant subjects, it is also worth the youth's while to complete school, particularly Matric (Grade 12) to stand a better chance of being admitted into universities or colleges, and also apply for learnerships, apprenticeship and other work training opportunities. It had been a challenge for most Black people to complete

school, this to an extent, remains a challenge in the younger generation. Several factors contribute to this, lack of financial resources, lack of education from parental side etc. However, in the current South Africa, high school drop should no longer be associated with youth unemployment.

In regard to the Black youth's unemployment duration, the results, showed that for every unit change in the Black youth's unemployment duration, the log odds of being employed decrease by 0.41. This supported the Black youth's concerns in that on average it takes most of the youth 19 months to find decent employment. In cases where the Black youth who have been unemployed for much longer period, had made no efforts to improve their capabilities be it through either additional courses or volunteering to gain work experiences their prospects of finding employment were very low.

Lastly, the results also show that a unit change in the Black youth's age, the log odds of being employed increased by 0.221. This supports the notions in that the older than 15 years of age, the likelihood of finding employment improves. Thousands of children in South Africa have been reported to be leading and taking care of families instead of being at school. In such instances, children younger than 18 years of age have less options but to search for employment, facing a higher incidence of unemployment as they had to forgo the opportunity of being at school to learn, improve and acquire competencies at basic education level.

Based on the results, it appears strongly that Maths Literacy could be considered a contributing factor towards unemployment and lack of skills development among the Black

youth. The observed negative association between Maths Literacy and development of fundamental mathematical, analytical and critical thinking capabilities, pose a grave concern to sustainable human development and the country's growth prospects. CME had called for the government and DBE to consider discontinuing the subject, and revert to the former higher and standard grade Maths policy, which sought to boost the learners' fundamental mathematical, critical thinking and analytical skills at separate levels according to their intellectual capabilities. The results, thus, strongly supports the view to reinstate Maths as a compulsory subject to foster a certain style of critical thinking, analysing which are essential for other skills development and advance youth employability in the country.

VI. CONCLUSION

The reasons for higher and rising youth unemployment in South Africa have most been researched from the supply side of the labour market. However, minimal attention has been channelled to investigate specifically a certain educational policy, such as Maths Literacy, and the effect thereof on a specific race in the country. Moreover, concerns that Black people, in particular, face severe skills shortages, still remains a large factor of the legacy of the old Apartheid regime.

The study investigated whether Maths Literacy is associated with the unemployment of the young Black South Africa who reside in the townships and informal settlements in Gauteng. The study focused on the characterisation and objective of three elements: Maths Literacy, Maths and computer literacy and technology, amid the country's increasing youth unemployment, in the cohort 15 to 24 years, and severe mathematical skills-shortages. The study drew its data from conducting two questionnaires, which were completed by the Black youth (employed and unemployed individuals) in the above cohort and employers from both public and private sector.

The study applied a logit regression analysis to reveal that Maths Literacy undermines the Black youth's employment prospects. This result was in line with Educational Expert and Economist, Spauls as well as CME's who raised the concerns that the subject has negative implications for the skills, competency and youth's employment opportunities. The study also realised that, despite DBE's perceived objective on the subject, Maths Literacy has presented a series of challenges for the Black youth's human capital and economic developments, instead of fostering

their mathematical and critical thinking skills. These findings, therefore, draws attention to the petition that DBE and the government should consider withdrawing Maths Literacy as an alternative subject to Maths.

In the current South Africa, which is struggling to achieve inclusive economic growth; there is a dire need to increase the number of Black youth with sound knowledge, good mathematical as well as computer technology skills. As the custodian of education and skills development, the government and DBE, it would be meaningful for DBE to consider remedial solutions which will directly encourage skills and competency developments which will strengthen both the youth's employment prospects and the labour markets objectives, and thus increase socioeconomic development. To achieve this, the youth, government, and the labour market need to work in partnership, with the respective parties taking responsibility to work towards improving critical skills and competencies.

In choosing certain subjects in high school, the youth either forgo or gain the opportunity to acquire a sound knowledge base and various competencies. As such, the Black youth have the full responsibility to seek guidance on the different subjects before making a certain choices between Grade 10 and 12. In regard to Maths Literacy, experts, academia and universities have openly shared concern on the subject and the effects thereof. Thus, going forward, the Black youth, should, one, shy away from Maths Literacy and two be mindful of other subjects, which will either contribute or undermine their employment and admission prospects into universities.

Role for the government and DBE's in skills and educational development is in two folds. One, government and DBE are responsible for developing the educational policies, particularly subjects that schools should offer as well as the skills that the country needs to develop from the various subjects. Findings from Mbonani and Bansilal in 2014 revealed that the vast majority of the both Maths Literacy and Maths learners lack the requisite algebraic skill to manipulate basic formula in order to arrive at solutions. The recommendation thereof called for DBE and the government to focus on developing, among others, learners' basic algebraic proficiency at lower grades in school, to ensure that critical thinking styles and analytical techniques are developed properly over time. In support of this recommendation, the study also call upon DBE to consider reinstating Maths as a compulsory subject, with the aim to focus on the development of basic algebraic proficiency in the entire schooling system.

Critics for Maths strongly believe that the subject presents great potentials for the development of a certain critical thinking style and analytical technique which will be useful in analytical work environment or under the Commerce, Sciences, and Engineering courses. In order to realise this across board, there need be adequate and sound teaching resources to meet the requirements of the youth at school, Secondly, taking note from the global trend with countries, institutions, companies and people moving into a digital phase, DBE ought to also consider furthering computer literacy and technology competencies among the Black youth and schools in the townships, informal settlements and rural areas. To have 24% of the Black youth in the study having never used or being exposed to a computer, is not accepted. Computer literacy and technologies have increased connectivity in every aspect of households and business environment bringing people, information, knowledge and markets together from anywhere in

the world. In improving these competencies, the youth, who are the primary recipients, stand to only gain good exposure and interests in other capacities, thus, propel human development.

From the labour market point of view, private sector companies, banks and the likes, have certain labour and subject requirements, which the youth will have to adhere to. In a number of cases, the private sector has raised few subjects: Maths, Physical Science, Accounting and Biology as important, more at an entry level positions. Maths in particular is said to be the ideal subject that all the youth should have studied. Moreover in seeking employment opportunities, the Black youth should be mindful that, over and above Maths, employers also look for communication (reading, writing and speaking) and presentation proficiencies. Most Black schools rarely prioritise and nurture these competencies, unlike the White, Indian and Coloured schools. Thus, in addressing Black youth unemployment as an element of skills development - to increase mathematical, analytical and computer literacy - the government, DBE and the Black youth should ideally strive to achieve two aspects: developing skills to be on par with their White, Coloured and India/Asian counterparts, and developing skills based on labour market and higher education admission requirements relevancy.

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APPENDIX A

IS MATHEMATICS LITERACY DETRIMENTAL TO BLACK YOUTH EMPLOYMENT:?

This survey is conducted for research purposes to obtain information on educational attainment and individual characteristics among individuals who are both employed and unemployed and between the ages 15 and 24 years. This questionnaire is composed of 54 questions and will take about 30 minutes. This is an anonymous survey. Your responses will only be used for the purpose of the research and will not be used for other purposes. Thank you for your cooperation and time. South Africa has 11 official languages; however the main language of government and business is English. As result, this survey will be conducted in English for research purposes.

Please indicate your employment status: Employed or Unemployed

Q1 Where did you attend high school?

- Public School (1)
- Private school (2)
- If other, please specify (3) _____

Q2 Please provide the name of the school that you attended:

Q3 Please indicate the highest grade attained in high school:

- STD 6/Grade 8 (1)
- STD 7/Grade 9 (2)
- STD 8/Grade 10 (3)
- STD 9/Grade 11 (4)
- STD 10/Matric/Grade 12 (5)

If you completed Matric, please skip questions 4 and 5.

Q4 If you did not complete high school, please provide reasons for not completing high school in the space below:

Q5 Which subjects did you take in the STD/Grade that was last attended? Please indicate the subjects in the space provided below:

Q6 If you did complete STD 10/Matric/Grade 12, did you get it:

- With university entrance (1)
- Without university entrance (2)
- Other (3)
- If other, please specify (4) _____

Q7 Which subjects did you take in STD 10/ Matric/Grade 12? Please indicate the subjects in the space provided below: **(Please indicate if you did Maths Literacy or Maths)**

Q8 Did you wish you study further after STD 10/Matric/Grade 12?

- Yes (1)
- No (2)

Q9 If your response is yes for the previous question, what would you have wanted to study?
Please provide your response in the space below:

Q10 Why would you have wanted to study that in particular?

Q11 Do you have **POST** high school qualifications? (Example: certificate, diploma or degree)

- Yes (1)
- No (2)

Please skip questions 12 to 19 if your response is NO for question 11. Start again on question 20.

Q12 If your response is yes to question 11; please indicate your highest qualification below:

- Certificate (1)
- Diploma (2)
- Bachelor's degree (3)
- Bachelor's degree and certificate (4)
- Bachelor's degree with diploma (5)
- Honours degree (6)
- Other, please specify (7) _____

Q13 Please indicate your qualification field or major:

- Health Science (1)
- Humanities (2)
- Law (3)
- Commerce/Business and Management (4)
- Science (5)
- Engineering and the Built Environment (6)
- Other, please specify (7) _____

Q14 Where did you obtain your qualification(s)?

- College (1)
- Technikon (2)
- University (3)
- Other, please specify (4) _____

Q15 Please provide the name of the institution where you obtained your qualification(s):

Q16 What made you decide on the type of institution that you attended?

- School fees (1)
- Distance (2)
- School credential (3)
- Parents (4)
- Friends (5)
- Other, please specify (6) _____

Q17 Please provide the year when you obtained your qualification:

Q18 Who paid for your tuition fees?

- Parents (1)
- Sponsorship (2)
- Loan (3)
- Self-funded (4)
- Other, please indicate other sources of funding (5) _____

Q19 Did you get any assistance on choosing your qualification?

- Yes, parents (1)
- Yes, sponsorship (2)
- Yes, loan provider (3)
- Other, please specify (4) _____
- No (5)

Q20 What is your mother's highest education attainment?

- Incomplete secondary school (1)
- Completed secondary school (2)
- Certificate without Grade 12/Std 10 (3)
- Certificate with Grade 12/Std 10 (4)

- Diploma without Grade 12/Std 10 (5)
- Diploma with Grade 12/Std 10 (6)
- Bachelor degree (7)
- Honours degree (8)

Q21 What is your father's highest education attainment?

- Incomplete secondary school (1)
- Complete secondary school (2)
- Certificate without Grade 12/Std 10 (3)
- Certificate with Grade 12/Std 10 (4)
- Diploma without Grade 12/Std 10 (5)
- Diploma with Grade 12/Std 10 (6)
- Bachelor degree (7)
- Honours degree (8)

Q22 Given an opportunity to work, where would you like to work?

- Private sector (1)
- Public sector (2)

Q23 Why would you choose that sector over the other?

Q24 Why have you been unsuccessful in finding a job? (**You can choose more than one option**)

- There are not enough jobs (1)
- There are jobs but I do not have enough information about the available jobs (2)
- I do not have the right proficiencies (3)
- I do not have enough education (4)
- I do not have experience (5)
- I do not do well in interviews (6)
- I do not know the right people, organisations hire through friends and family (7)
- Organisations discriminate against me because of my race (8)
- Wages are too low (9)
- Other, please specify (10) _____

Q25 How long have you been without work and seeking work? In years.

Q26 If you cannot find the type of work you are looking for would you settle for other work?

- Yes (1)
- No (2)

Q27 Would you consider work without pay?

- Yes (1)
- Yes, depending on the work (2)
- No (3)
- Yes, depending on the institution (4)
- Yes, other (5) _____

Q28 What is the lowest monthly wage or salary that you would accept for a job with a 40-hour work- week?

Please indicate the amount in **Rands** (1) _____

Q29 Would you prefer to be employed by an organization or to work for yourself? Please elaborate on your response:

Q30 What do you think are your chances of finding employment?

- 0 percent (1)
- 20 percent (2)
- 40 percent (3)
- 60 percent (4)
- 80 percent (5)
- 100 percent (6)

Q31 Please provide your opinion: treat each statement separately, and do not feel guided by prior statements.

	Wrong (1)	rather wrong (2)	rather right (3)	right (4)
I am well educated and do not understand why I am unemployed (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am discouraged to look for work (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am frustrated and need work (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel like I made a mistake on my qualification (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Non-governmental institutions should intervene in helping the youth get employable (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q32 In your view, who is responsible for taking action to solve youth unemployment?

Q33 Do you have any suggestions on how the unemployment problem of young people could be solved?

Q34 Are you aware of any programmes in relation to preparing young people for work? Please indicate your response in the space below:

Q35 What activities, projects or programmes are you involved with in relation to preparing yourself for work? Please indicate your response in the space below:

Q36 What issues do you face in gaining access to employment, training or education?

Q37 Do you know what the National Youth Development Agency (NYDA) is?

- Yes (1)
- No (2)

Q38 If your response is yes for the previous question; please indicate what you know about the National Youth Development Agency (NYDA) in the space provided below:

Q39 Is there a computer at home?

- Yes (1)
- No (2)

Q40 Do you know how to use a computer?

- Yes (1)
- No (2)

Q41 What do you use the computer for?

Q42 Please indicate your computer literacy below (example please indicate Microsoft word – Fair, Microsoft powerpoint – fair etc.):

	Good (1)	Fair (2)	Poor (3)
(1) Microsoft Word	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(2) Microsoft Excel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(3) Microsoft PowerPoint	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(4) Microsoft Outlook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(5) Internet Explorer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q43 Do you like Mathematics?

- Yes (1)
- No (2)

Q44 How would you rate your Mathematics teacher at school?

- Good (1)
- Fair (2)
- Poor (3)

Q45 How would you rate your Mathematics proficiency?

- A (80 - 100%)
- B(70 - 79 %)
- C(60 - 69%)
- D(50 - 59%)
- E (40 - 49%)
- F (33.3 -39%)

Q46 How would you rate your English teacher at school?

- Good (1)
- Fair (2)
- Poor (3)

Q47 How would you rate your English proficiency?

- A (80 - 100%)
- B(70 - 79 %)
- C(60 - 69%)
- D(50 - 59%)
- E (40 - 49%)
- F (33.3 -39%)

Q48 Please indicate your age:

- 15 (1)
- 16 (2)
- 17 (3)
- 18 (4)
- 19 (5)
- 20 (6)
- 21 (7)
- 22 (8)
- 23 (9)
- 24 (10)

Q49 What is your gender?

- Male (1)
- Female (2)

Q50 Marital status:

- Never (1)
- Married (2)
- Divorced (3)
- Widowed (4)
- Separated (5)

Q51 What is your home language/ mother tongue?

Q52 Number of children:

- None (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 (6)
- If more than five, please indicate the number (7) _____

Q53 Where do you live? For example Emfihlweni in Tembisa or Zola in Soweto

Q54 Who do you live with? Please specify for example mother, father or grandmother.

Thank you for completing the survey!

APPENDIX B

Youth unemployment and education attainment within the Gauteng province in South Africa

This questionnaire is conducted for research purposes to obtain information on Employers' Organisations on youth development and employment. This questionnaire is composed of 11 questions and will take about 25 minutes. Your responses will only be used for the purpose of the research and will not be used for other purposes. South Africa has 11 official languages; however the main language of government and business is English. As result, this survey will be conducted in English for the purposes of this research.

Name of the employer organisation _____

Q1 Does the organisation have a youth development program(s)?

- Yes (1)
- No (2)

Q2 If your response to question 1 is yes; please provide the name of the program(s):

Q3 What is the objective(s) of the youth program(s)

Q4 Who qualifies for the program(s)?

Q5 Please indicate the age bracket for the program(s).

Q6 How is the program structured?

Q7 Is there a certified qualification after completion of program for participants?

- Yes (1)
- No (2)

Q8 How do you measure the quality of the program(s) and the success rate?

Q9 If you want to hire a person between the ages 15 to 24, what are the academic and proficiencies requirements?

Q10 What are your organisation's computer literacy requirements?

Q11 How much would you pay your personnel with the following qualifications: (Please indicate the amount per monthly)

- | | |
|---|---------|
| <input type="radio"/> Incomplete secondary school | R _____ |
| <input type="radio"/> Completed secondary school | R _____ |
| <input type="radio"/> Certificate without Grade 12/Std 10 | R _____ |
| <input type="radio"/> Certificate with Grade 12/Std 10 | R _____ |
| <input type="radio"/> Diploma without Grade 12/Std 10 | R _____ |
| <input type="radio"/> Diploma with Grade 12/Std 10 | R _____ |
| <input type="radio"/> Bachelor degree | R _____ |
| <input type="radio"/> Honours degree | R _____ |

Thank you for completing the questionnaire.