ICT ENTREPRENEURSHIP DEVELOPMENT FOR POVERTY ALLEVIATION IN NIGERIA: A LOOK AT THE TIMING OF CISCO IT ESSENTIALS EXAMINATION

Okon, E.O[1], Yusuf, M.S[2], Joshua B. Agbogun[3], Ogba,Paul O[4]

[1]Department of Economics, Kogi State University, Anyigba, Nigeria
[2]Department of Mathematical Science, Kogi State University, Anyigba, Nigeria
[3]Department of Mathematical Science, Kogi State University, Anyigba, Nigeria
[4]Information Technology Resource Centre, Kogi State University, Anyigba, Kogi State, Nigeria

Abstract: This paper examines the free Cisco Information Technology Essential Training in Nigeria organized by A3 Foundation with support from the Rockefeller Foundation-Digital Job Africa to empower 1000 High Potential but Disadvantaged youth across: FCT, Niger, Bauchi, Kogi, Nassarawa, and Kaduna. The aim of examining the candidates at the end of the free Cisco IT Essentials training was to find them fit for Cisco certification which enhances their employment and entrepreneurship levels. Specifically, the paper looked at the proctoring and timing of the Cisco examinations as it affects performance. Research population involves the student who took part in the free Cisco IT Essential Training in Kogi State University's ICT Centre. The study employed primary data to arrive at its conclusions. Findings indicate that majority of the respondents were of the opinion that they need more time to answer the final practical question on computer. Most of respondents were of the view that students need more time to read and answer the final examination questions on computer. As far as assembling of computer was concerned, a very large number of the respondents were of the conviction that students need more practice time to assemble computer from the bottom. A surprisingly large proportion of the respondents' expressions show that students need to be given the opportunity to configure a working network by themselves. A similarly large magnitude of respondents said more time should be given for them to read and answer questions from all the chapters of the Cisco IT Essential training module. Despite all the observations made, an astonishing large percentage of respondents said that they will recommend the program to other people. Since Cisco exams involve multiple-choice test items which involve critical thinking processes, it was suggested that students should study carefully before the exam and watch the stipulated time for every exam. There is no good substitute for knowing the right answer. Even a well-prepared student can make silly mistakes on a multiple choice exam, however, or can fall prey to distracters that look very similar to the correct answer.
Keywords: Poverty Alleviation, ICT, Entrepreneurship Development, CISCO, Nigeria

1. Introduction

Given the contributions of education, especially at the tertiary level, to national development, countries, individuals, communities and corporations invest massively in education to uplift their educational attainment. In Africa, there has been continuous expansion in the budgets towards the education of its citizens. Alongside the government increased budget on education are the increases in enrolment rate and the number of tertiary institutions. In Nigeria, for example, there were 53 Universities, 54 Colleges of Education and 55 Polytechnics in 2003, but as at 2007, the numbers increased to 93 Universities, 56 Colleges of Education and 58 Polytechnics (ILO, 2009).

Despite this upsurge number of tertiary institutions; enrolment rate; and increased graduate turnout, the issues of graduate unemployment and underemployment with their attendant consequences (such as increased crime rate, unfulfilled dreams, suicide, impaired financial position, etc.) are posing a great challenge to many developing countries of which Nigeria is one. In Nigeria, national unemployment rate escalated from 11.9 percent in the year 2005 to 14.9 percent in 2008. As at 2009, the rate had increased to 19.7 percent (NBS, 2010). Statistics according to National Planning Commission's Performance Monitoring report on government's Ministries. Department and Agencies (MDA's), shows the unemployment rate in 2010 was 21% which rose to 23.9% in 2011. A National Baseline Youth Survey Report by National Bureau of Statistics (NBS) reveals that 54 % of Nigerian Youths were unemployed in 2012 out of a total population of 64 million comprising youths aged between 15 and 35 years. Of this figure, 51.9% are female, compared to 48.1% male (Sodipo, 2014). Also, the National Bureau of Statistics reported that Nigeria's employment crisis worsened in the first quarter of 2016, with unemployment rate rising to 12.1 per cent (Udo, 2016). It further rose to 13.3 percent at the end of the second quarter (Akingbade, 2016).

Nigeria has one of the world's highest economic growth rates, averaging 7.4% according to the Nigeria economic report released in July 2014 by the World Bank. Poverty still remains significant at 33.1% in Africa's biggest economy (Wikipedia, n.d.). According to the latest poverty report by the National Bureau of Statistics, NBS, about 112 million Nigerians (representing 67.1 per cent) of the country's total population of 167million (Vanguard (2016) (also, see Table 1 in Appendix for Economic Indicator Listing For Nigeria in the year 2015). For a country with massive wealth and a huge population to support commerce, a well-developed economy, and plenty of natural resources such as oil, the level of poverty remains unacceptable. The country experiences poverty problem just like other countries especially among the developing nations. This is common because of inability of government to employ or absorb all the graduates being turned out from tertiary institution in large number every year. This trend can only be reversed or changed if some of these graduates roaming the streets and becoming hoodlums, prostitutes, militants, religious sects, armed robbers, and other vices could engage themselves in ICT Entrepreneurship thereby reducing the rate of crime and insecurity in the

society. This will in turn reduce the level of poverty in Nigeria and the economy would improve as well (Umeano, 2012).

The entrepreneur is not just somebody that is self-reliant, but one that can also absorb others that are unemployed and stands through thin and thick situations and still survives, makes profits, provide for his family and pay those he employed. At present, the International Communities namely UN, EU are beginning to focus in one way or the other on the entrepreneur as a key to not only putting an end to poverty but, they are beginning to understand that the entrepreneur can play a key role in the economy of a nation(Umeano, 2012).

Rasouli and Noory (2009) found in a study that there was a positive and significant relationship between the use of information technology and communications and training for skills employment for job creating. Baharestan*et al* (2012) found in a study that there was a significant positive relationship between the presence of information technology and intellectual investments and variables of IT and ICT on organizational entrepreneurship. In addition, information can be used as a moderating variable, and increases the positive impact of intellectual investment on organizational entrepreneurship. Yaghoobi (2010) in a survey reached the conclusion that there was a significant positive relationship between entrepreneurship enforcement in higher education and the use of information and communications technology. Hindle and Klyver (2007) in an investigation have found that there was a positive and significant relationship between the rate of media using such as television, the Internet and creating jobs and businesses for youths.

Malek *et al* (2009) found in a study that there was a direct access of people to ICT and knowledge of organization staffs about the needs of market and customers, and their entrepreneurial behavior, and significant correlation existed and ICT has high potential for the development of different factors influencing on the development of organizational entrepreneurship. Hiyousung (2002) in a research study found that there was a significant and positive relationship between the rate of utilization of information and communications technology and improving educational performance in order to enhance agricultural products. Teodoras et al (2008) in their study concluded that there was a significant and positive relationship between the uses of ICT in entrepreneurship cooperation with improving the product sales process. Laito and Ferreire (2012) in a research project found that there was a significant positive relationship between regular activities around ICT and improving entrepreneurship speed, economic growth, employment, and job creating.

This paper examines the free Cisco Information Technology Training in Nigeria organized by A3 Foundation with support from the Rockefeller Foundation-Digital Job Africa to empower 1000 High Potential but Disadvantaged youth across: FCT, Niger, Bauchi, Kogi, Nassarawa, and Kaduna with expansion program in focus to accommodate other potential states. The aim of examining the candidates at the end of the free Cisco IT Essentials training was to find them fit for Cisco certification which enhances their employment and entrepreneurship levels. Examination could be seen as one of the most objective techniques used in the measurement of learning outcomes at all levels of education in Nigeria and the world over. In another vein,

examination was defined as the process of an external administrator formally examining various parties, students or candidates. Examination may be administered orally, on paper, on computer or in a confined area that requires an examinee to physically perform a set of skills (Zakka, J. (2014).

This paper specifically looked at the timing of the Cisco examinations as it affects performance. The result from this study will help fill the literature gap because according to Takeda (2007), literature review for a study that looks at the time that students take to finish a multiple choice exam was done with no results. However, past studies have been done on the ordering of multiple choice exams, test taking strategies, and the amount of time that students put into their studies. The ordering of multiple choice exams has been studied. This is the order of the questions, whether sequentially as introduced in the readings or lectures, or a scrambled ordering. When the ordering of questions is scrambled, the student scores are lower (Balch, 1989) but research exists that denies these findings (Neely et al., 1994).

There are papers that study test taking strategies. The old adage that, when in doubt go with your first impression on a multiple choice exam, has been confirmed and debated. Some say that this is a good strategy and that when you reread and consider other choices, you start to read things that are not in the question. Some say that be careful but if you have to change but the myth of always sticking with the first impression may not be true (Dutch, 2006, Edwards and Marshall, 1977). Other studies look at strategies for students with disabilities (Barry and Moore, 2004).

The amount of time that a student puts into studying inside and outside of class has also been addressed. The time for self-study may be of little significance to the exam scores (Dolton et al., 2003). Other studies looked at how students allocate their study time with respect to the material being presented (Son and Metcalfe, 2000).

2. Cisco: Overview

Cisco is the worldwide leader in networking that transforms how people connect, communicate and collaborate. One of the world's largest technology companies, Cisco is an American-based multinational corporation that designs and sells consumer electronics, networking, voice, and communications technologies and services. Cisco career certifications are globally recognized as the preeminent credentials for IT network professionals.

2.1. Cisco Certifications

Cisco certifications validate your ability to use the best-in-class networking and business communications devices from Cisco Systems. The "Cisco Career Certification" program offers a diverse range of credentials that bring measurable rewards to network professionals and the companies that employ them.

Cisco certifications improve your understanding of networking in more than just Cisco products; throughout the certification learning process, candidates will develop a complete understanding of IT networking and how different network topologies interact to form a secure and efficient network. This "big picture" knowledge is beneficial in any networking role, and it's one of the many reasons Cisco certifications are in consistent demand, even at companies with few Cisco products (IT Career Finder, n.d.).

The latest generation of Cisco certifications was designed to be more compatible with the day-to-day activities of computer networking professionals, thus Cisco certification candidates can quickly acquire the credentials that prove their job-specific expertise to hiring managers.

2.2. Five Levels of Cisco Certification

This newest generation of Cisco certifications features five levels of general IT certification; from lowest to highest the Cisco certification levels are: Entry, Associate, Professional, Expert and Architect.

2.2.1. Eight Paths of Cisco Certification

Within the five levels of Cisco certifications, the Cisco Career Certification program features various paths (a.k.a. tracks) so you can match your Cisco learning path to your specific job role or industry. The 8 Paths of Cisco certifications are:

1. **Routing and Switching:** This is the Cisco Certification path for Network Professionals who install and support Cisco networks containing LAN and WAN Routers and Switches.
2. **Design:** The Design Cisco Certification path is aimed at Network Professionals who Design Cisco networks in which LAN and WAN routers and switches reside.
3. **Network Security:** This is the Cisco Certification path for Network Professionals who Design and Implement Cisco Secure Networks.
4. **Service Provider:** This Cisco Certification path is aimed at Network Professionals that work with Infrastructure or Access Solutions in a Cisco environment - primarily in the telecommunications arena.
5. **Service Provider Operations:** This is the Cisco Certification path for Network Professionals who Manage, Maintain, and Troubleshoot complex Service Provider Networks.
6. **Storage Networking:** This Cisco Certification path is for Network Professionals who Implement Storage Solutions over extended networks utilizing multiple transport options.
7. **Voice:** The Voice Cisco Certification path is for Network Professionals who Install and Maintain Voice over IP (VoIP) Networks.
8. **Wireless:** The Wireless Cisco Certification path is aimed at Network Professionals who Configure, Implement, and Support Wireless Networks.

2.3. Benefits of Cisco Certification:

- Cisco certified professionals are among the highest paid IT professionals in the world.
- Cisco certifications validate skills in networking, one of the fastest growing and most versatile IT domains.
- According to a Fairfield Research survey, CCNA certification gives on average a 16.7% salary increase.
- Industry data proves that each Cisco certification earned brings an increase in the IT professional's salary.
- Getting Cisco certified opens the door to exciting and lucrative IT careers in the government and military.
- Resumes with Cisco certifications grab the attention of information technology recruiters and employers.
- Cisco certified professionals gain access to a global community of like-minded network professionals.

2.4. Popular Cisco Certifications:

i. CCENT Certification

Cisco CCENT Certification validates skill as an entry-level Network Technician. Cisco Certified Entry Networking Technician (CCENT) certification covers the basics of computer networking. CCENT certified technicians understand the essential networking topics, such as network security & threat mitigation, IP addressing, and routed & switched networks. CCENTs can install, operate, configure & troubleshoot networks for a small branch office.

Passing the CCENT certification exam (Interconnecting Cisco Networking Devices Part 1 or "ICND1") is a tangible first step toward earning the CCNA certificate, the next stage in Cisco's popular Routing & Switching certification track. The CCNA is comprised of the CCENT (ICND1) plus ICND2. Many network professionals pursue ICND1 & ICND2 simultaneously to maximize learning time and resources, as the CCNA is a more valuable and comprehensive credential. Becoming a Cisco Certified Entry Networking Technician will boost confidence and preparation for the more advanced Cisco certification tracks, like the CCNP.

ii. CCNA Certification
Cisco CCNA Certification demonstrates competence as a Network Professional. Cisco Certified Network Associate (CCNA) certification validates your ability to install, configure, operate and troubleshoot routed & switched networks. CCNA certified professionals can make connections to remote sites via a wide area network (WAN), mitigate basic network security threats, and understand fundamental networking concepts and terminology. CCNA certification is Cisco's most popular certification, and one of the tech industry's most sought-after career credentials. Becoming CCNA certified is a distinctive first step toward a rewarding career as a network administrator or engineer.

iii. CCDA Certification

Cisco CCDA certification demonstrates competence as a Network Design Professional. Cisco Certified Design Associate (CCDA) certification validates the skills needed to design a secure Cisco network. CCDA certified network professionals can design routed and switched network infrastructures and services involving LAN, WAN and broadband access. The CCDA certification exam covers the design of basic voice, campus, security, data center and wireless networks. Becoming a Cisco Certified Design Associate is a tangible first step toward an exciting and lucrative career as a network designer or network engineer.

iv. CCNP Routing & Switching

Cisco CCNP Routing & Switching demonstrates competence as a professional Network Engineer. Cisco Certified Network Professional Routing & Switching (CCNP R&S) certification is appropriate for network professionals with at least one year of networking experience who are ready to advance their career and work independently on Cisco network systems.

CCNP certification validates the knowledge and skills to plan, implement, verify and troubleshoot local-area networks (LANs) and wide-area networks (WANs) at the enterprise level. CCNP certified pros can effectively collaborate with specialists on advanced security, voice, wireless and video solutions. Cisco Certified Network Professionals can achieve success in enterprise-level networking roles, such as network administrator, network engineer, network technician, or systems engineer (IT career finder, n.d.).

3. A3 Foundation- Rocafellar Foudation Free Cisco IT Essential Training in Nigeria

The Rockefeller Foundation is a private foundation based at 420 Fifth Avenue, New York City. It was established by the six-generation Rockefeller family (Wikipedia, 2017a) with the aim of promoting the well-being of humanity throughout the world (Rockefellerfoundation, n.d.). On the other hand, the A3 Foundation is a Nigeria-US based nonprofit organization that helps and provides for unemployed youths, orphans and vulnerable children in Nigeria. The A3 foundation currently deploys Free Cisco IT Essential Training through support from the Rockefeller Foundation-Digital Job Africa to empower 1000 high potential but disadvantaged youth across: FCT, Niger, Bauchi, Kogi, Nassarawa, and Kaduna states with expansion program in focus to accommodate other potential states(A3foundation, 2017).

3.1. Whom was trained?

Those that were trained included: Youths, Age 18-35 years; and women. Some of them were seeking career-oriented, entry-level hardware and software skills to prepare for careers in technical support roles and information and communications technology (ICT); some wanted to gain skills and working knowledge of how computers work, how to assemble computers, and how to troubleshoot hardware and software issues.

3.1.1.What Geographic Coverage?

Nigeria: Officially the Federal Republic of Nigeria is situated in the Western part of Africa. Its coastal boundary is delimited by the Gulf of Guinea in the south and the land boundary is shared by Cameroon and Chad in the east, Niger in the north and Benin in the west. Abuja is Nigeria's capital city and Lagos is its largest city. Nigeria covers a total area of 923,768 sq. km. making it the thirty second largest country of the world. It has a small coastline of 853 km in comparison to its total land boundary of 4047 km. The latitudinal and longitudinal extent of the country is 4° to 14°N and 2° to 15°E respectively (Maps of World, n.d.). Nigeria has 36 states and a federal capital territory (FCT).

3.1.2. What was trained on?

Basically, Cisco IT Essentials was trained on. The Cisco's IT Essentials is a PC Hardware and Software curriculum which introduces the skills needed to help meet growing demand for entry-level information and communication technology (ICT) professionals. It covers the fundamentals of PC technology, networking, and security, and also introduces advanced concepts (Cisco Press, 2013).

3.2. Why was Cisco IT Essentials Necessary?

Due to changing patterns in service delivery, technology is gradually replacing many human efforts as well as reduce the number of staff in organization, however there is a shortage of certified and qualified manpower in handling these technologies hence Cisco IT Essentials as a course is equipped to cover the fundamentals in PC computer technology, networking, preventive maintenance and repairs of computers, printer repairs and client management.

3.2.1. The Training

The foundation has a mandate to identify, train, mentor and place 1000 High Potential but Disadvantaged Youth in Nigeria in digital jobs. They view this as an alternative to other conventional forms of empowerment.

In partnership with schools and organizations in Nigeria, the Foundation delivers a comprehensive learning experience to help students develop ICT skills for entry-level career opportunities, continuing education and globally recognized career certifications.

With support from the ROCKEFELLER Foundation, and innovative partnerships with CISCO Network and Microsoft Nigeria, they deployed free ICT training for High Potential but Disadvantaged Youths in Nigeria under the Digital Jobs Africa initiative.

3.3. Current Statistics

Six hundred and twenty nine (629) trained in four(4) states and the FCT

3.3.1. Number of Trained HPDY

• Bauchi - 146

• FCT - 90

• Niger state - 200

• Nassarawa state - 83

• Kogi - 110 (A3foundation, 2017).

3.4. Placement

3.4. In Collaboration with VIKO Nigeria

A3 Foundation collaboration with VIKO Nigeria has so far been rewarding, this partnership has guaranteed that our trainees are gainfully engaged in making money from the hospitality sector through online airline bookings, hotel reservation and interstate bus bookings.

3.4.2. In Partnership with Funds and Electronic Transfer

The A3 Foundation has a memorandum of understanding with FETS to ensure that all its trainees in the Digital Jobs Africa Project are adequately engaged as mobile agents, where an average trainee gets to earn a minimum of N 30,000 monthly as commission from transaction (A3foundation, 2017).

Figure 1: Images of IT Essential trainees
Source: A3foundation (2017)

4. Methodology

4.1. Area and Method of Study

The A3 foundation currently deployed Free Cisco IT Essential Training through support from the Rockefeller Foundation-Digital Job Africa to empower 1000 High Potential but Disadvantaged youth across: FCT, Niger, Bauchi, Kogi, Nassarawa, and Kaduna states. However, the area of focus in this study is Kogi state.

Kogi is a state in the north-central zone of Nigeria. It is popularly called the confluence state due to the fact that the confluence of Rivers Niger and Benue occurs there. Its capital is Lokoja. There are three main ethnic groups in Kogi: Igala, Ebira, and Okun; with the Igalas being the largest ethnic group in the state. There are many mineral resources in Kogi, including iron, petroleum and tin.

Figure 2: Map of Nigeria showing Kogi state
source: Ngex (2013)

Kogi State is the most centrally located of all the states of the federation. It comprises the Igala, Ebira, Kabba, Yoruba and Kogi divisions of the former Kabba province. It shares common boundaries with Niger, Kwara, Nassarawa and The Federal Capital Territory to the north. To the East, the state is bounded by Benue and Enugu states, to the south by Enugu and Anambra States, and to the west by Ondo, Ekiti and Edo states. Lokoja, the Niger/Benue confluence town is the state capital. Ethnically, Yoruba, Nupe and Bassa forming the main ethnic groups (Ngex, 2013).

Kogi state is home to the (Federal University Lokoja), Kogi State University Anyigba, Federal Polytechnic Idah, Kogi State Polytechnic (Lokoja),Federal College of Education (Okene), College of Education (Ankpa), College of Agriculture Kabba, Kogi state college of education, technical (Kabba), federal university Lokoja and the Private Salem University. There is a college of nursing and midwifery in Obangede, School of health tech in Idah and ECWA School of Nursing in Egbe (Wikipedia, 2017b).

There were two A3 foundation free Cisco IT Essential Training centres in Kogi state: Kogi State Polytechnic, Lokoja, and Kogi State University, Anyigba. The focus of this study was on the Kogi State University training centre which held at the ICT Centre of the institution which has state-of-the-art information and communication technology (ICT). The training was conducted by Cisco certified instructors. Test and assignments were given. Exams were proctored, timed, and delivered in a secure environment.

Research population involves the student who took part in the free Cisco IT Essential exam in Kogi State University's ICT Centre. They were about 100 in number. A sample of fifty (50) respondents from 18 years and above were randomly selected to give their perception on the

issues raised for the study out of a total of 100 participants from different local government areas of Kogi State. The study adopted survey research design in the collection of primary data.

A self-developed two-option response format questionnaire (dichotomous scale (Yes/No)) constructed with the aim of reducing boredom, fatigue and demand on the target participants so that they do not exhaust their energy, time and effort in answering the questions. It was believed that this approach is bound to elicit the best responses from the participants in terms of objectivity, frankness, originality, pointedness on key issues and promptness of response.

The questionnaires were administered to respondents by the researchers after weeks of theory, practical training and final examination on Cisco IT Essentials which covers: Introduction to the PC; Lab Procedure and tool use; Computer Assembly; Overview of Preventative Maintenance; Operating Systems; Networks; Laptops/desktops; Mobile Devices; Printers; Advanced Troubleshooting. The online examination was timed and proctored (Proctored exams are exams with time limits that you complete while online proctoring software monitors your computer. Proctoring software checks that you (as the person taking the exam) are the same person who is taking the course for credit, and detects any attempts to cheat on the examination (Edx, n.d.)) in a supervised environment (ICT Centre, KSU). This helped in verifying candidates' identities and ensures academic integrity.

The instrument was designed into two sections. Section "A" consists of respondents' personal data while section "B" consists of six items on issues of concern. An-on-the-spot collection of the questionnaires was made to ensure a high return, and there was 100% return rate. It should also be noted that in-depth interview was conducted among the respondents. The data collected for the study was analyzed using percentages, tables, bar-charts, and pie-charts. Data collected were subjected to statistical analysis using percentages, table, pie-chart, cone-chart, pyramid-chart, etc. The use of weighted mean score involves assigning numerical values to respondent's rating of factors or phenomenon. This method was used for its simplicity and ease of communicating the result of the research by ranking in order of importance and severity the issues that require time during Cisco IT Essentials training and examination. The evaluation of factors or phenomenon was based on assigning weights as follows: Yes=2; No=1. The weighted mean score for each factor is determined as follows: $\text{WMS} = \frac{3n_3 + 2n_2 + 1n_1 +}{n_3 + n_2 + n_1}$. Chi-square test was employed to test the stated null hypothesis (H_0): students do not need more time to finish Cisco IT Essential exams for better performance. If the test statistic is more extreme than the critical value, then the null hypothesis is rejected in favor of the alternative hypothesis. If the test statistic is not as extreme as the critical value, then the null hypothesis is not rejected.

4.2. Data Presentation and Analysis

The data on the empirical aspect of the study is presented here. It covers the result of the questionnaires administered especially section "B" which consists of six items on issues of concern about the mode of examination and timing of the examination. Many of the bio-data of

respondents were left out, such as: name, address, state of origin, educational status, occupation, marital status, etc. However, a frequency distribution of respondents' bio-data analysis of age and gender were presented.

Table 2: Gender Distribution of Respondents

		Frequency	Pie-Section	Percent	Valid Percent	Cumulative Percent
Valid	Male	32	230.4^o	64	64	64
	Female	18	129.6^o	36	36	100.00
	Total	50	360°	100.00	100.00	

Source: Field Survey

Table 4.1 shows that 64% of the respondents were male while 36% were female. Although the majority of the respondents were males, the participation of female in the Free Cisco IT Essential Training could be said to be impressive. This is because over the years, there has been a consistent record of low female representation and participation in science and technology, specifically, in the area of Information and Communication Technology (ICT). This trend not only exists in African and other developing countries, but in many developed nations like Nigeria as well (Liverpool, 2004). According to Kenneth (2014), the federal government of Nigeria pledged its commitment to promote the participation of girls and women in Information and Communication Technology (ICT) activities. The aimed was to demystifying ICT, and make girls and women see ICT as a viable career option that could empower and positively impact on their future. In that regard, the government of Nigeria launched the "Smart Woman Nigeria" and "1000 Girls in Training" programmes to encourage female participation and skills development in ICT which will enhance their employment opportunities (Sotunde , 2013).

Table 3: Age Distribution of Respondents

		Frequency	Pie-Section	%	Valid %	Cumulative %	Reverse Cumulative %
Valid	18 –30	37	266.4^o	74	74	74	100.00
	31 –45	10	72°	20	20	94	26
	46 and above	3	21.6^o	6	6	100.00	6
	Total	50	360°	100.00	100.00		

Source: Field Survey

Table 3 above shows that the ages between 18 and 30 years constitute 74% of the respondents while those between 31 and 45 years old constitute 20%. Ages between 46 and above constitute 6%. This shows that majority of the respondents are between the ages of 18 and 30 which is quite a youthful age bracket. Astonishing turn up of youths for the Free Cisco IT Essential Training could be attributed to the reorientation on being self-sustaining with high achievement through the use of Information and communication technology (ICT) (the current trend has always been of young people migrating from rural to urban areas in search of white collar jobs that are nowhere to be found). With these, many have shown interest in changing the face of society through the use of Information and communication technology, focusing mainly on impacting worthwhile skills and practical knowledge in the areas of networking, computers and

Global System of Communication (GSM) repairs (Babayo, 2016). With such skills, the average young people can organize themselves in order to address their own needs and interests. They can make their particular contribution to social progress and be an asset to the growing economy of Nigeria.

Table 4: Do students need more time to answer the final practical question on computer?

Response					
Yes		No		Total	
No of Yes	% of Yes	No of No	% of No	Total Responses	Total %
44	88	6	12	50	100

Source: Field Survey

From a table 4, majority of the respondents (44), that is, 88% of them were of the perception that they need more time to answer the final practical question on computer. On the other hand, a handful of the respondents represent about 12% viewed contrary. The IT Essentials course covers the fundamentals of computer and mobile devices hardware and software and advanced concepts such as security, networking, and the responsibilities of an IT professional. The final practical questions are online multiple choice exams which is a form of an objective assessment in which respondents are asked to select the only correct answer out of the choices from a list. In this case, the ordering of questions was scrambled, that is a plausible reason why majority of the respondents feel they required more time to answer the questions. Balch (1989) has shown that students' exam scores are lower when the ordering of questions is scramble
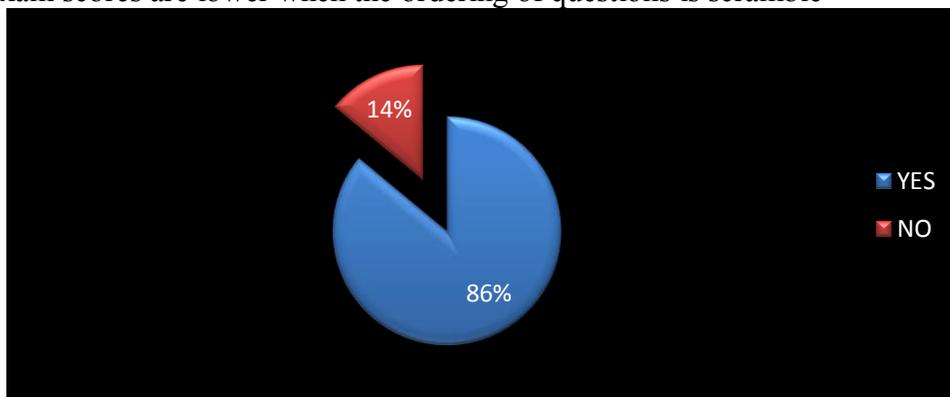

Figure 3: Do students need more time to read and answer the final examination question on computer ?
Source: Field Survey

The IT Essentials final examination consists of a set of multiple-choice questions. Passing scores are set by using statistical analysis and are subject to change. At the completion of the exam, candidates receive a score report along with a score breakout by exam section and the passing score for the given exam. Several sources indicate that multiple-choice test items involve critical thinking processes (Appleby, 1990; Scialfa et al., 2001; Williams and Clark, 2004; Yoder and Hochevar, 2005). However, the responses as indicated in the 2-dimension pie-chart in Figure 3 shows that 43 respondents (representing about 86% of respondents) were of the opinion that students need more time to read and answer the final examination questions on computer. An opposite view was expressed by 14% of the respondents (i.e., precisely 7 respondents). According to Takeda (2007), the time required by students to take a multiple choice exam is

different, dependent on the student. Students take different amounts of time when given a multiple choice exam, seemingly in a random fashion. One train of thought seems to be that good students know the material so they are prone to take less time. Another way of reasoning is that good students are diligent in checking their answers during test taking so they would take more time. On the other hand, one thought is that poor performing students take less time because they do not know the answers. Another way of reasoning is that poor performing students take more time because they are struggling through the exam.
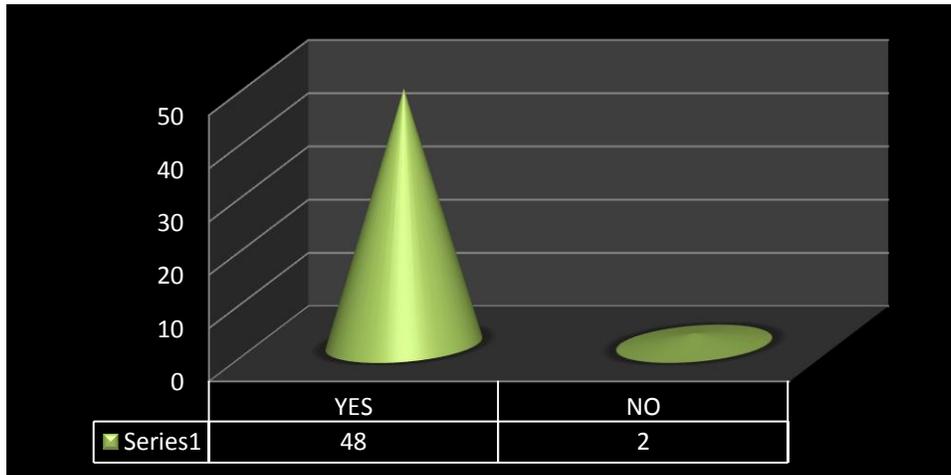

Figure 4: Do students need more practice time to assemble computer from the snatch?
Source: Field Survey

The goal of computer assembling in the IT Essentials training is to enable students assemble a desktop computer from compatible components and upgrade a computer system to meet requirements. The vertical cones in Figure 4 report that approximately 96% of the respondents (48 respondents to be precise) were of the opinion that students need more practice time to assemble the computer from the snatch while the remaining two (2) did not think so. The inference drawn from this data is that a very large majority of the respondents were of the conviction that more practice is required to enable them assemble a computer system.
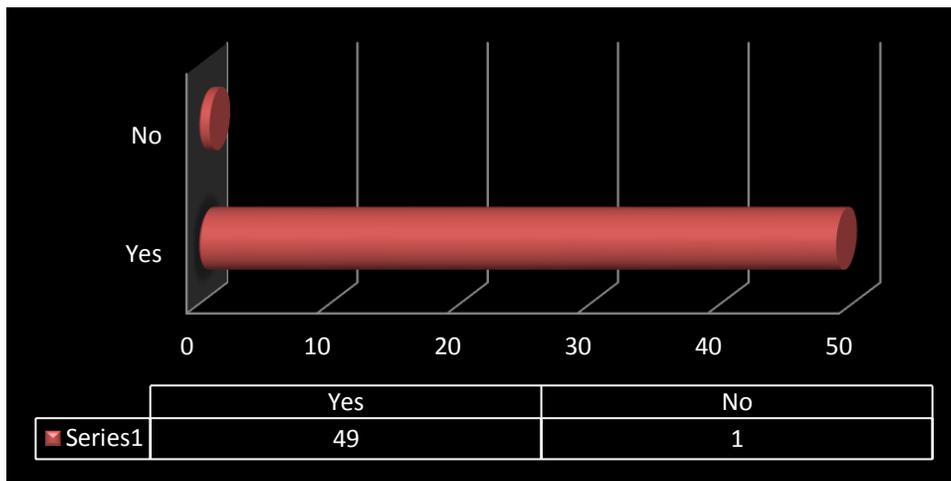

Figure 5: Do students need more time to configure a working network by themselves ?
Source: Field Survey

The main aim of networking in the IT essential training is to describe, create and maintain a network. It also involves configuring devices to connect to local-area networks (LANs), the Internet and Cloud services. When the issue of network configuration was raised, the result presented in the horizontal cylinder chart above reveals that 98% of respondents (49) were highly of the opinion that students need to be given the opportunity to configure a working network by themselves while others thought otherwise(4% of respondents).
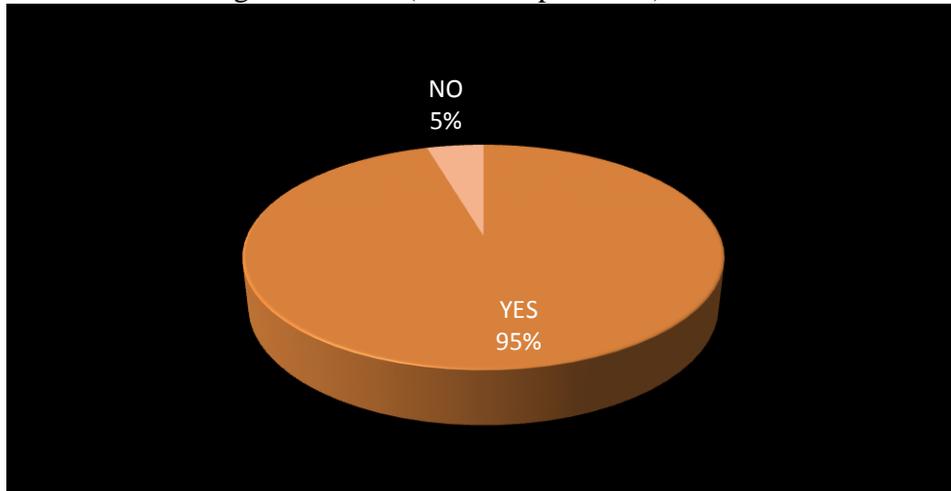

Figure 6: Should students be given more time to read and answer questions from all the chapters of the Cisco IT Essential training module?
Source: Field Survey

IT Essential training modules especially version 5 covered chapters including: introduction to personal computer; lab procedures and tool use; computer assembly, operating system, printers, mobile devices, etc. The 3-dimension pie-chart in Figure 6 reveals the perception of respondents when asked whether there is enough time to read and answer questions from all the chapters of the Cisco IT Essential training module. Invariably, there was not enough time to read and answer questions from all the chapters of the Cisco IT Essential training module as replied by 95% of respondents who said yes(i.e., enough time should be given for them to read and answer questions from all the chapters of the Cisco IT Essential training module. Surprisingly, 5% of respondents begged to differ.
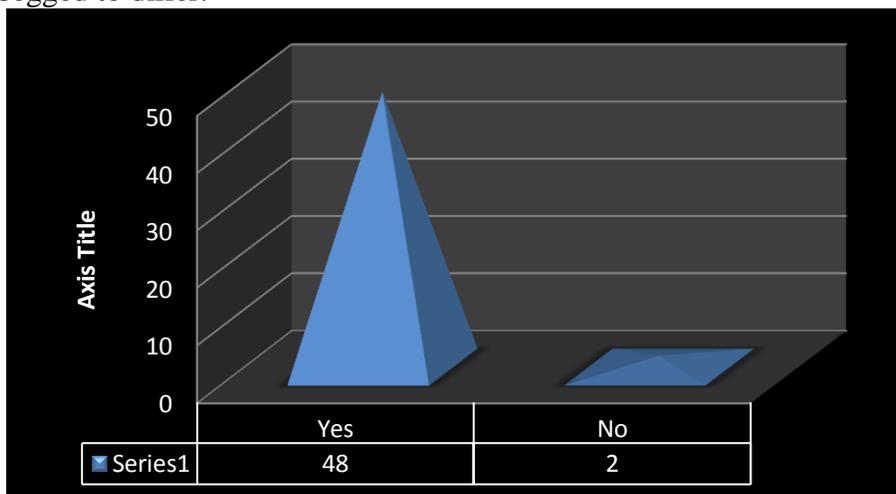

Figure: Would you recommend somebody for the program next time?
Source: Field Survey

444

Despite the issues raised and the perception of the students, at completion of the IT Essential training when many of the students were interviewed personally they said that they were able to perform the following tasks: describe the components of a personal computer; perform a step-by-step assembly of a desktop computer; install and support the Windows 7 operating system; upgrade and replace components of a laptop and printer, configure computers to connect to an existing network; perform preventive maintenance and basic troubleshooting, among others. As such respondents were asked if they would advise or suggest to other people to enroll for the IT Essential training. The 3-dimesion pyramid above shows an overwhelming response by the respondents. Large percentage (96%, i.e., 48 respondents specifically) of the respondents said that they will recommend other people for the program.

By inspection of the tables and chart, it was obvious that student need more time to finish the Cisco IT Essential Exams for better performance, however, a Chi-Square test was conducted to show the statistical significant at 5% level. Since the computed value of chi-square ($\chi^2 = 8.75$) exceeded the critical value (3.841) given the degree of freedom (1), we rejected the null hypothesis and concluded that students do need more time to finish Cisco IT Essential Exams for better performance (see Box 1 in Appendix).

Table 5: Weighted Mean Score

S/No	Response	Yes	No	Total Score	Weighted Score	Mean Score	Rank
		(weight =2) (frequency) (%)	(weight=1) (frequency)(%)	(frequency)(%)	(weight) X (frequency)	weighted score/ Total frequency core	
1	Do students need more time to answer the final practical question on computer ?	44(88%)	6(12%)	50(100%)	94	1.88	3
2	Do students need more time to read and answer the final examination question on computer ?		7(14%)	50(100%)	93	1.86	4
3	Do students need more practice time to assemble the computer from the snatch?	48(96%)	2(4%)	50(100%)	98	1.96	2
4	Do students need more time to configure a working network by themselves ?	49(98%)	1(4%)	50(100%)	99	1.98	1
5	Should students be given more time to read and answer questions from all the chapters of the Cisco IT Essential training module?	48(96%)	2(2%)	50(100%)	98	1.96	2

Source: Field Survey

The weighted mean score(WMS) result presented in Table 5 above shows the ranking in order of importance and severity the issues that require time during Cisco IT Essentials training and examination. It shows that the issue of students needing more time to configure a working network by themselves is ranked 1st. This is closely followed by the need for more practice time to assemble computer and the need for more time to read and answer questions from all the chapters of the Cisco IT Essential training module. Both issues were ranked second.

5. Summary, Conclusion and Recommendation

This paper examines the free Cisco Information Technology Essential Training in Nigeria organized by A3 Foundation with support from the Rockefeller Foundation-Digital Job Africa to empower 1000 High Potential but Disadvantaged youth across: FCT, Niger, Bauchi, Kogi, Nassarawa, and Kaduna. Specifically, the looked at the mode, timing and proctoring of the Cisco examinations as it affects performance. Research population involves the student who took part in the free Cisco IT Essential Training in Kogi State University's Digital centre. Research population involves the student who took part in the free Cisco IT Essential Training in Kogi State University's Digital centre. They were about 100 in number. A sample of fifty (50) respondents from 18 years and above were randomly selected to give their perception on the issues raised for the study out of a total of 100 participants from different local government areas of Kogi State. The study adopted survey research design in the collection of primary data. Findings show that majority of the respondents (44), that is, 88% of them were of the perception that they need more time to answer the final practical question on computer. It was revealed that 43 respondents (representing about 86% of respondents) were of the opinion that students need more time to read and answer the final examination questions on computer. Furthermore, as far as assembling of computer was concerned, approximately 96% of the respondents (48 respondents to be precise) were of the opinion that students need more practice time to assemble computer from the snatch. 98% of respondents were highly of the opinion that students need to be given the opportunity to configure a working network by themselves. 95% of respondents said yes that more time should be given for them to read and answer questions from all the chapters of the Cisco IT Essential training module. Despite all these observations during the examination, majority of the respondents (96%) said that they will recommend the training to other people. The weighted mean score (WMS) result shows that the issue of students needing more time to configure a working network by themselves was ranked 1st   in order of importance and severity.

Due to changing patterns in service delivery, technology is gradually replacing many human efforts as well as reduce the number of staff in organization, however there is a shortage of certified and qualified manpower in handling these technologies hence Cisco IT Essentials as a course is equipped to cover the fundamentals in PC computer technology, networking, preventive maintenance and repairs of computers, printer repairs and client management. The aim of examining the candidates at the end of the free Cisco IT Essentials training was to find them fit for Cisco certification which enhances their employment and ICT Entrepreneurship level which in turn reduce the level of poverty in Nigeria. Since it is not easy to acquire a Cisco certification, this paper recommends that the students must take adequate coaching and guidance before appearing for any such exam. Since Cisco IT examinations consists of a set of multiple-choice questions, a special method of preparation distinctly different from an essay exam is required for maximizing the success on the multiple choice exams. The best way to improve a student's chances, of course, as suggested in this paper is that:

446

Student should study carefully before the exam (i.e., begin studying early; make sure that you identify and understand thoroughly everything that your instructor emphasized in class; brainstorm possible questions with several other students who are also taking the course; Practice on sample questions, if you have access to a study guide or old exams). There is no good substitute for knowing the right answer. Even a well-prepared student can make silly mistakes on a multiple choice exam, however, or can fall prey to distracters that look very similar to the correct answer.

Student should watch the stipulated time for every exam, it's important to calculate the amount of time one can spend on each section or question according to the number of marks its worth. Do the easy questions or sections first - this is helpful for calming nerves and establishing your concentration. It is also important to work at a fairly quick pace; multiple choice exams are notorious for being long. However, skipping around the exam can waste valuable time, because at some point you will have to spend time searching for the skipped questions and re-reading them. A better approach is to answer each question in order.

Students should try taking a few breaks during the exam by stopping for a moment, shutting your eyes, and taking some deep breaths. Periodically clearing your head in this way can help you stay fresh during the exam session. Remember, you get no points for being the first person to finish the exam, so don't feel like you have to race through all the items - even two or three 30-second breaks can be very helpful (Social Psychology Network, 2017).

On the part of Cisco examiners/instructors they should give a reasonable more time to enable good and poor students alike to finish their exams.

Limitations of the Study

Some demographic information about respondents were not taken into consideration such as: educational qualification, prior knowledge about computer, computer anxiety, emotional stability, etc. Inclusion of such information would have help us understand the reason behind the perception of respondents concerning the issues raised.
Due to inadequate resources, the study was not extended to other A3 Foundation- Rocafellar Foudation Free Cisco IT Essential training centres in FCT, Niger, Bauchi, Nassarawa, and Kaduna states. Even at that, it was only the KSU training centre that was considered for the study while the Kogi State Polytechnic, Lokoja was left out. But still the result was used for generalization. As such, it should be taken with caution.

References

Akingbade , A. (2016).These Charts Explain the Current State of Unemployment in Nigeria. http://venturesafrica.com/these-charts-explains-the-current-state-of-unemployment-in-nigeria/https://twitter.com/a3foundation1.

Appleby, D. (1990). A Cognitive Taxonomy of Multiple-Choice Questions. In Makosky, Sileo, Whittemore, Linda, Landry, Skutley (Eds.), *Activities Handbook for the Teaching of Psychology* (Vol. 3, pp. 79-82). Washington, DC: American Psychological Association.

A3foundation (2017). A3iLearn. http://thea3foundation.org/?p=99

Babayo, I. (2016). "The Role of ICT in the Future of Nigerian Youth". http://www.yourcommonwealth.org/economic-development/the-role-of-ict-in-the-future-of-nigerian-youth/

Baharestan, A., Rezaei Dowlatabadi, H and Akbari, C.(2012). Explore the Impact of Information and Communications Technology and Intellectual Capital on Corporate Entrepreneurship (Case Sobhan Oncology). The Second Conference of Student Entrepreneurs, 78-96 pp, Tehran,Iran. (In Persian)

Barry, L. M., and Moore, W. E. I. (2004). Students with Specific Learning Disabilities Can Pass State Competency Exams: Systematic Strategy Instruction Makes a Difference. *Preventing School Failure,* 48(3), 10-15.

Cisco Press (2013). IT Essentials Course Booklet, Version 5 - Cisco Press. *www.ciscopress.com/store/it-essentials-course-booklet-version-5-9781587133091*

Dolton, P., Marcenaro, O. D., and Navarro, L. (2003). The Effective use of Student Time: A Stochastic Frontier Production Function Case Study. *Economics of Education*, 22(1), 547-560.

Dutch, S. (2006). Taking Multiple Choice Tests. Retrieved 1/5/07, from http://www.uwgb.edu/DutchS/multchc.htm

Economy Watch (2016).Nigeria Economic Statistics and Indicators. http://www.economywatch.com/economic-statistics/country/Nigeria/

Edwards, K. A., and Marshall, C. (1977). First Impression on Tests: Some New Findings. Teaching of Psychology, 4(4), 193-.221.

Edx (n.d.). Taking a Proctored Exam.http://edx.readthedocs.io/projects/edx-guide-for-students/en/latest/completing_assignments/SFD_proctored_exams.html

Heyshong, P. (2004). Factors that Affect Information Technology Adoption by Teachers, 5(2), 569- 576.

Hindle, K and Klyver, K. (2007). Exploring the Relationship Between Media Coverage and participation in Entrepreneurship. International Entrepreneurship Journal, 3(2),132-156.

International Labour Organization (2009): *Report on Nigerian Education*. ILO, Nigeria.

IT Career Finder (n.d.).Cisco Certifications. http://www.itcareerfinder.com/it-certifications/cisco-certifications.html.

Kenneth, C. (2014). FG Pledges to Promote Girls, Women Participation in ICT – LEADERSHIP. https://www.nigerianbulletin.com/threads/fg-pledges-to-promote-girls-women-participation-in-ict-leadership.55800/

Leito, J and Ferreire, J. (2012). ICT and Entrepreneurship: A comparative analysis between Portugal and Germany, 6(1), 136-152.

Liverpool, L.S. (2004).Women and the Development of Information and Communication Technology (ICT) in Nigeria: A Case Study of Two Nigerian Universities. https://www.widernet.org/sites/default/files/Introducingresearch.pdf.

MalekMohammadi, A. Alam, Beigi, M., and Moghimi, M.(2009). Regression Analysis of the role of ICT in the Development of CE(A Case Study of Agricultural Extension). *Journal of Economics and Agricultural Development*,1(1), 1-10. (In Persian)

Maps of World (n.d.).Where is Nigeria ? http://www.mapsofworld.com/nigeria/nigeria-location-map.html

National Bureau of Statistics (NBS) (2010). Labour Force Survey March, 2009. *Statistical News: Labour Force Statistics in Nigeria,* ISSN 0794 – 1954, 476.

Neely, D. L., Springston, F. J., and McCann, S. J. H. (1994). Does Item Order Affect Performance on Multiple Choice Exams? *Teaching of Psychology,* 21(1), 44-45.

Ngex (2013).Kogi State, Nigeria. http://www.ngex.com/nigeria/places/states/kogi.htm.

Rasouli, N. A. and Noory, M. (2009). Iran ICT impact on Employment. *Journal of Economic Research,* 89(4), 87-107. (In Persian).

Rockefeller Foundation (n.d.)**.** Rockefeller Foundation: Building Greater Resilience and More Inclusive Economies. https://www.rockefellerfoundation.org/

Scialfa, C., Legare, C., Wenger, L., & Dingley, L. (2001). Difficulty and Discriminability of Introductory Psychology Test Items. *Teaching of Psychology*, *28*(1), 11-15.

Social Psychology Network (2017). Tips on Taking Multiple-Choice Tests. https://www.socialpsychology.org/testtips.htm

Sodipo, O.O. (2014).Employability of Tertiary Education Graduates in Nigeria: Closing the Skills-Gap. *Global Journal of Human Resource Management,* 2(3), 28-36.

Son, L. K., and Metcalfe, J. (2000). Metacognitive and Control Strategies in Study-Time Allocation. *Journal of Experimental Psychology,* 26(1), 204-221.

Sotunde , O.B. (2013). Nigeria Encourages Increased Female Participation In ICT
http://venturesafrica.com/nigeria-launches-programs-to-increase-female-participation-in-ict/

Takeda, H. (2007). Examination Timing and Student Performance: The Longer You Take the Worse You Will Do? AIS Electronic Library (AISeL). *aisel.aisnet.org/cgi/viewcontent.cgi?article=1034&context=sais2007*

Theodoros, A. , Illias, P. ,and Panagiotis, K. (2008). ICT Impacts on Greek Entrepreneurship accordingly to governmental programme .*Competitive paper for Haicta Conference,* 3(1), 76-89.

Udo, B. (2016).Nigeria's Unemployment Crisis Worsens; Rate Jumps by 518,000 in 3 months — NBS. http://www.premiumtimesng.com/news/headlines/203891-nigerias-unemployment-crisis-worsens-rate-jumps-518000-3-months-nbs.html

Umeano, N. E. (2012).ICT Entrepreneurship Development: A Way of Alleviating Poverty in Nigeria. *Journal of Management and Entrepreneurial Development,* 2(1), 27- 32.

vanguard (2016).Poverty: 112m Nigerians Live Below Poverty Line. http://www.vanguardngr.com/2016/10/poverty-112m-nigerians-live-poverty-line/

wikipedia (n.d.). Poverty in Nigeria. https://en.wikipedia.org/wiki/Poverty_in_Nigeria

Wikipedia(2017a). Foundation. https://en.wikipedia.org/wiki/Rockefeller_Foundation

Wikipedia (2017b). . Kogi State. https://en.wikipedia.org/wiki/Kogi_State

Williams, R., and Clark, L. (2004). College Students' Ratings of Student Effort, Student Ability And Teacher Input as Correlates of Student Performance on Multiple-Choice Exams. *Educational Research*, *46*(3), 231-239.

Yaghoubi, J. (2010). Factors Hindering Entrepreneurship in Higher Education in Agriculture and Provide Mechanisms to Strengthen it. *Journal of Entrepreneurial Development*, 8(2), 121-139. (In Persian).

Yoder, J., and Hochevar, C. (2005). Encouraging Active Learning Can Improve Students' Performance On Examinations. *Teaching of Psychology*, 32(2), 91-95.

Zakka, J. (2014).Innovative Strategies for Curbing Examination Malpractices in Public Examinations in Nigeria. www.unn.edu.ng/publications/files/ZAKKA.pdf

Appendix

Table 1: Economic Indicator Listing for Nigeria, 2015.

2015	Indicator Value
GDP Growth (Constant Prices, National Currency)	2.653 %
GDP (Current Prices, National Currency)	NGN 95,177.74 Billion.
GDP (Current Prices, US Dollars)	US$ 490.207 Billion
GDP Deflator	136.396 (Index, Base Year as per country's accounts = 100)
GDP Per Capita (Constant Prices, National Currency)	NGN 390,444.92 .
GDP Per Capita (Current Prices, National Currency)	NGN 532,549.36 .
GDP Per Capita (Current Prices, US Dollars)	US$ 2,742.86
GDP (PPP), US Dollars	US$ 1,091.70 Billion
GDP Per Capita (PPP), US Dollars	US$ 6,108.41
GDP Share of World Total (PPP)	0.962 %
Implied PPP Conversion Rate	87.183
Investment (% of GDP)	14.48 %
Gross National Savings (% of GDP)	12.049 %
Inflation, Average Consumer Prices (Indexed to Year 2000)	173.125 (Index, Base Year 2000 = 100)
Inflation (Average Consumer Price Change %)	9.01 %
Inflation, End of Year (Indexed to Year 2000)	180.15 (Index, Base Year 2000 = 100)
Inflation (End of Year Change %)	9.554 %
Import Volume of All Items Including Goods and Services (Percent Change)	-1.853 %
Import Volumes of Goods Only (Percent Change)	12.369 %
Export Volume of All Items Including Goods and Services (Percent Change)	11.354 %
Export Volumes of Goods Only (Percent Change)	9.698 %
Unemployment Rate (% of Labour Force)	9.9 %
Population	178.721 Million
General government revenue (National Currency)	NGN 7,445.45 Billions.
General government revenue (% of GDP)	7.823 %
General government total expenditure (National Currency)	NGN 11,236.69 Billions.
General government total expenditure (% of GDP)	11.806 %
Total Government Net Lending/ Borrowing (National Currency)	NGN -3,791.24 Billions.
Total Government Net Lending/ Borrowing (% of GDP)	-3.983 %
Fiscal Year Gross Domestic Product, Current Prices	NGN 95,177.74 Billions.
Current Account Balance (US Dollars)	US$ -11.918 Billion
Current Account Balance (% GDP)	-2.431 %

Source: Economy Watch (2016)

Box 1: Chi-Square Test Result

Contingency Table for the Calculation of Chi Square (χ^2)

	Do students need more time to answer the final practical question on computer?	Do students need more time to read and answer the final examination question on computer ?	Do students need more practice time to assemble computer from the snatch?	Do students need more time to configure a working network by themselves ?	Should students be given more time to read and answer questions from all the chapters of the Cisco IT Essential training module?	Row Total
YES	44(46.4)	43(46.4)	48(46.4)	49(46.4)	48(46.4)	232
NO	6(3.6)	7(3.6)	2(3.6)	1(3.6)	2(3.6)	18
Column total	50	50	50	50	50	250

The first step was to compute the expected cell frequencies for each of the cells. For each cell, the expected cell frequency is equal to the row total multiplied by the column total and divided by the grand total (the sum of all cells). The table shows the observed data with the expected cell frequencies in parentheses. Note that the expected cell frequencies, when added down the columns or across the rows give the same row and column totals of the original data.

The value of chi-square (χ^2) was computed using the following formula:

$$\chi^2 = \sum_{j=1}^{k} \frac{(O_I - E_I)^2}{E_I}$$

Where:

O = Observed frequency
E = Expected frequency
Σ = Sum of above across all cells

Computed $\chi^2 = \frac{(44-46.4)^2}{46.4} + \frac{(43-46.4)^2}{46.4} + \frac{(48-46.4)^2}{46.4} + \frac{(49-46.4)^2}{46.4} + \frac{(48-46.4)^2}{46.4} + \frac{(6-3.6)^2}{3.6} + \frac{(7-3.6)^2}{3.6} + \frac{(2-3.6)^2}{3.6} + \frac{(1-3.6)^2}{3.6} + \frac{(2-3.6)^2}{3.6}$

Computed $\chi^2 = $ 0.12 + 0.25 + 0.06 + 0.15 + 0.06 + 1.6 + 3.21 + 0.71 + 1.88 + 0.71

Computed $\chi^2 = 8.75$

The computed value of chi-square was compared with the appropriate critical value. Because *df* = (number of rows - 1)(number of columns - 1) = (2-1)(2-1) = 1, the critical value of chi square is 3.841 (alpha= 0.05).
Since the computed value of chi-square exceeds the critical value, we concluded that students do need more time to finish Cisco IT Essential exams for better performance.