

# The Challenges of ICT Graduate Un-Employment in Developing Economies in Africa - Case Study: Ghana

<sup>1</sup>Edward Danso Ansong, <sup>2</sup>Emmanuel A. Affum, <sup>3</sup>James. B. Hayfron-Acquah

<sup>1</sup> Department of Computer Science & I.T, Valley View University  
Oyibi-Accra, Greater Accra, Ghana

<sup>2</sup> Department of Electrical Engineering, Kwame Nkrumah University of Science & Technology  
Kumasi, Ashanti-Region, Ghana

<sup>3</sup> Department of Computer Science, Kwame Nkrumah University of Science & Technology  
Kumasi, Ashanti-Region, Ghana

## Abstract

This paper seeks to elucidate the various challenges of Information & Communication Technology (I.C.T) graduate un-employment in the sub-Saharan Africa, and the remedies that can be used to address those issues. This research postulates some four modules of I.C.T graduates and categorized graduates of I.C.T in one of such modules. The study again went further to analyze the calibre of each category of I.C.T graduates who pass out of the various tertiary institutions and their job prospects. The paper concludes by identifying the major causes of the growing concern on these challenges and measures that can address the growing phenomenon of I.C.T graduate un-employment across developing countries.

**Keywords:** I.C.T, Module, 3-E-D, Graduate

## 1. Introduction

In the past, there was a prevailing tendency of employers recruiting graduates, fresh from the universities, to work directly in their companies and organizations without the need for additional training because higher educational institutions as it were, satisfied the employers needs. In recent times, there has been a paradigm shift leading to a growing concern about the role of Universities especially in highly skilled workforce which I.C.T is no exception. Meanwhile, I.C.T growth rate across the sub-region has grown astronomically over the past few years e.g. Ghana's growth in I.C.T for 2011 achieved an unprecedented rise of 10.5% as compared with previous years (Courtesy 2011 Ghanaian Budget). A recent report by the International Labour Organization (I.L.O) on "*Global Employment Trends for Youth*" revealed that the number of unemployed 15 to 24 year-old youth has risen sharply by 15% from 74

million to 85 million in the last decade, leaving one third of the world's young people without jobs with the majority from the region. The report also noted that people in this age group are three times more likely to be unemployed as older adults, especially in developing countries. The global unemployment rate for young people in 2005 was 13.5% compared to 4.5% for adults. It is therefore imperative that, I.C.T education and training be encouraged by stakeholders to generate more employment for our youth.

Statistics from institutions and state agencies across countries in the sub region has shown that, only a small fraction of the massive "I.C.T based High-Tech" contracts are usually executed by wholly indigenous companies and therefore, foreign I.T companies are normally the beneficiaries. One very interesting observation which was also realized among these indigenous I.C.T based companies were that, majority of them are subsidiaries of companies outside of the sub-region, or owned by indigenous people who were trained abroad and with some level of exposure overseas.

The outcome of this statistics however suggests that, most graduates from the universities in the sub-Saharan Africa are usually skewed towards Module 3 & 4. This paper therefore, attempts to analyze the factors associated with this challenge, its impact and measures that can be taken by the various stakeholders to mitigate this growing phenomenon.

A summary of this research as described shall look at the significance of the research, a postulated model among which I.C.T graduates fall under, the next section also

looks at the novel 3-E-D approach in solving I.C.T graduate employment challenges, we also discuss the I.C.T policy in Ghana as a case study and their challenges. Finally, we conclude with some recommendations in resolving some of our I.C.T graduate challenges and how stakeholders can contribute to their solutions.

## 2. Significance of the study

Most of the related researches sampled across the sub-Saharan Africa were focused on graduate un-employment in general e.g. Akinyemi et al (2011) of Nigeria and only some few works discussed on the subject area i.e. the role of I.C.T and social impact on employment e.g. Oye et al (2011) of Nigeria, Yidana et al (2003) of Ghana among others. However, almost all the works sampled tend to attribute the problem of graduate un-employment in the sub-Saharan Africa (with I.C.T inclusive) to the effect that, products from the universities, as the employers put it, “do not fit into positions that the job market really need in terms of the requisite skills required to meet the demands of modern day jobs”. This issue has therefore become an arguably, one of the phenomenal topic of discourse among employers and employee forums. Most I.C.T graduates do not even believe in the programs they pursue at the undergraduate level. The significance of this study, however, is to identify the cause of this phenomenon i.e. the mismatch between graduate turnout vis-a-vis their skills and graduate employment in the area of I.C.T among the sub-region. The study found that graduate turnout in the 3<sup>rd</sup> & 4<sup>th</sup> modules have currently outpaced the graduate employment rate in the sub-Saharan Africa, and thereby creating “artificial” I.C.T graduate un-employment in the sub-region. The figure below shows one of the questions asked of some I.C.T degree students across the country about the need for further practical training.

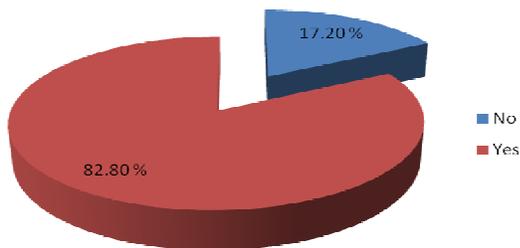


Fig. 1 Do you need to study a professional course after graduation to fine tune what you have studied at the university?

This thereby leaves Module 1 & 2 with huge opportunities un-tapped.

The other significance of this paper is to contribute to the on-going research on graduate un-employment with special emphasis on I.C.T, and to harness strategies from

the various stakeholders that could improvise the shortfalls of I.C.T graduate un-employment in other modules. In light of this, we shall be employing the “Three-Dimensional Employment (3-E-D) approach” to deal with this problem, which involves Educational Facilities, Employment Prospects and Enrolment criterion for those job prospects.

## 3. Postulated Modules

In this research, we have identified and postulated four key modules within which I.C.T graduates fall in. The classification is based on the extent of the skills acquired i.e. level of proficiency in I.C.T an individual graduates may belong. The classifications are namely – Innovators, Supervisors, Maintenance and Theory Modules.

### 3.1 Sophisticated Skills trainers – Innovators module

This category of I.C.T graduates are considered as the elite yet, less number of graduates are inspired to come out of the universities as innovators with creative minds each year. Other names for this model include inventors, Scientists, Engineers, Re-Engineers, System Designers etc. Though there have been debates over such people whether they are naturally gifted or the formal training at the Universities had impact on their special skills; notable example that comes in the minds of people are the Microsoft founders Bill Gates and Paul Allen (who were college dropouts). Back home in the west-African sub-region, one of such names that keep coming up in the area of I.C.T is Roland Agambire of RLG Communication who rather had his degree in Business Administration at Ghana Institute of Management and Public Administration (GIMPA) and yet, has very strong creative minds in Technology with the production of all kinds of Electronic systems. Apostle Kojo Safo of Christo Asafo in Ghana is a name that cannot be left out in the area of Technology and Re-Engineering. He did not even have the opportunity to study at the college and yet, well noted for his genius in re-engineering in the African sub-region, and a host of others.

Beyond this, the great majority of the world inventors and innovators will admit that, the universities they attended changed their lives. Personalities like Dr. Ave Kludze of NASA, who is a Ghanaian inventor with several patents to his name. He and his team helped developed the Calipso Satellite (a robotic spaceship) and drove men to orbit in 2006 carrying astronauts. Dr. Kludze will never stop short of his experience at Rutgers University, U.S.A. In one of his interviews on BBC on Challenges of I.C.T in Africa, he said “We need Governments to invest in technology so the educational institutes can follow”. Again, personalities

like Dr. Thomas Mensah, who has achieved 7 patents in U.S and worldwide in Fibre Optics over a period of six years, Dr. Mike Adenuga Jnr. from Nigeria, the founder of Globacom (or GLO) Telecommunication Limited, one of the leading Telecommunication companies in West Africa, among a host of others are those who fall under this module.

### 3.2 Managers Skills trainers – Supervisory module

The second highest level is the supervisory module. People who fall within this category are those who are able to come up with innovative ways of managing the technologies created by Module 1. Other names given to this module include System Analysts, Network Administrators, Database Managers, and I.T Auditors, among others. This category of people is heavily sought for but next to the first module 1. It must also be mentioned that it is the second least in terms of I.C.T graduates, who come out of the university each year.

Unfortunately, people who fall within this category are normally people who have studied professional careers in computer centres apart from their university degree. Interestingly, most of the courses they study at those professional centres are normally courses they might have even passed at the university and yet, require such centres to fine tune their practical skills to be better fit in the job market. This and other issues therefore raises serious questions as to whether the universities are really doing enough to graduate the right calibre of youth who can handle tomorrow's technology today.

### 3.3 Technical Skills trainers – Maintenance module

This category of I.C.T graduates are those who fall in module 3. These people are usually referred to as the "Technical guys" in I.C.T. They are usually those who perform the core or fundamental I.C.T duties within the organization. They are usually given terms such as I.T support, Networking and Hardware officers in the company.

Interestingly, most universities in the sub-region do not train graduates limited to Hardware or Networking because it is considered to be the basics to Information Technology (I.T). We also identified, in the course of the research that, graduates who usually end up in such positions are sometimes due to the fact that, those were the only vacant opportunities they can occupy and therefore had no choice. Meanwhile, when they end up in those areas, they tend to drop from a top Module to a lower model such as this.

### 3.4 Theoretical Skills trainers – Theory module

This module is the fourth but not the least of the modules already discussed. People in this module are unfortunately, those who usually end up in academia. This category of I.C.T graduates are usually those who make the best in terms of Cumulative Grade point Average (CGPA) and normally on top of their class. They have a good understanding of the conceptual framework of the program they pursue and sometimes practically too, but the motivation to extend this to the Module 2 is usually a challenge as compared with model 1.

Meanwhile, the study also showed that, students also have a critical role to play. The un-limited internet connectivity available now in the universities now instead of being useful, has rather not served its purpose. Most students in recent times spend much of their time on social networking sites without any motivation. It is therefore recommended that some level of restrictions must be installed so that students can use productive time practicing.

We however included in our questionnaire, the level of motivation students obtain during their degree program. Figure 3.1 shows the respondents we had during the country wide exercise. In the question, they were made to grade themselves as to how they find themselves and their fortunes in I.C.T in some years to come after graduation.

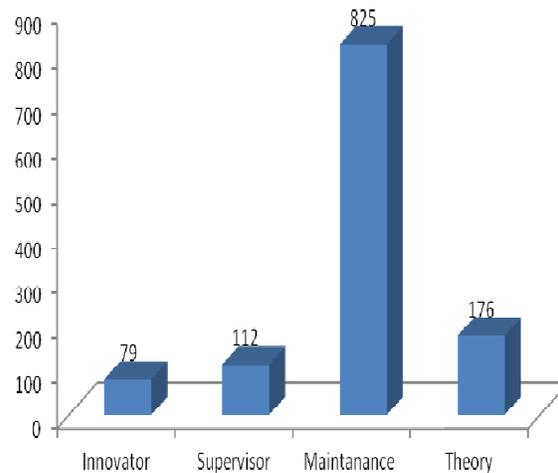


Fig. 2 Calibre of I.C.T graduate sampled nationwide

## 4. The 3-Employment-Dimensional Approach

I.C.T graduate challenges can only be tackled head-on if we decide to address it holistically. We therefore referred this holistic approach as the 3-E-D approach. This refers to

the 3-E-Dimensional approach. This includes Educational Facilities, Employment Prospects and Enrolment criterion for those job prospects. These three dimensions put together can give a comprehensive solution to the problem of I.C.T graduate un-employment.

#### 4.1 Educational Facilities

This scope is not just limited to the universities, polytechnics and training centres but also cover areas such as government supports, funding, and the provision of resources among others to enhance the capacities of the various universities and other institutions.

Governments support in the sub-region in the area of funding research activities must be explicit and in conformance with the respective countries I.C.T policy interest, which honestly speaking, is so ambiguous it does not even conform to our needs in the sub-region. Studies have shown that Universities across the sub-region have not been challenged to meet their respective I.C.T policies because of lack of awareness.

Our educational experiences in India, China and Europe at least shows that, scientists and engineers in those countries, are given the requisite funding and support to sensitive and high interest areas in technology including research and resource materials. This therefore lays enormous challenge in those countries institutions to provide the much needed innovations that they need to industrialize those countries in the area of technology [2].

One of the vital institutions required for this to be successful is the state agencies mandated to monitor and supervise the working and operations of the various universities. In Ghana for instance, the National Accreditation Board (NAB) is the statutory body mandated to perform those duties. The agency must be empowered to raise and maintain the standard across the universities to churn out the right calibre of graduates with the requisite skills to innovate, manage and maintain the latest technologies that will be implemented.

Finally, the various universities should also be encouraged to expand the practical curriculum at the universities. Even though, some of the universities we identified, had some form of laboratory programs, however, these are non examinable. Rather, it is geared towards a further understanding of the theory thought in class. Moreover, examination is also focused on the written thereby depriving prospective I.C.T graduates from the practical experience they deserve.

#### 4.2 Employment Prospects

It is important that, students with special interest in I.C.T should be made to go for internship in institutions or companies who are into those areas. Our study shows that, the NAB has successfully been able to encourage universities to implement this as part of their curriculum. However, our interview with some graduates in the field of I.T shows that, this policy is not effective enough. They are usually made to run errand and therefore given limited roles during the internship. We therefore suggest the permanent solution to this problem is to carry out an annual stakeholder's forum between the universities and Employers to differentiate between their "Needs from Wants" in order to make the necessary changes in their curriculum.

Secondly, most university authorities are usually looking elsewhere to partner universities abroad for collaborations. In as much as this could be in a positive direction, we however believe that, much attention should also be focused in I.C.T institutions and companies within for collaborations. This will therefore afford I.C.T graduates the opportunity to have a hands-on training on the job market.

MoU's between the universities and the companies must be clear on the requisite skills they want their students to have during the intern and come out with a curriculum spelt out for such purposes. There is also a growing concern or misconception of allowing interns to have a practical experience on an organization's infrastructure. This therefore puts a lot of limitations to the level of access those interns could have.

#### 4.3 Enrolment criterion

The tertiary institutions – the Universities and Polytechnics – that offer programs in I.C.T must be able to come out with clear cut strategies to produce highly skilled graduates specialized in specific areas. Most of our institutions only provide generalized skills training and therefore, we produce graduates with lack of speciality [4]. The curriculum of most universities in the U.S.A, Europe and other developed countries, runs programs in I.C.T and other fields so as to expand the job prospects of their graduates. e.g. programs such as Computer Science & Electronics, Information Systems & Human Resource, Software Engineering & Accounting among others. However, a few institutions in the sub-region have their syllabus carefully structured in that light.

## 5. ICT Policy for Ghana

Ghana's ICT policy has suffered a serious setback because of a number of reasons. First of all, the policy document did not focus on the I.C.T needs other than the wants of the country. However, the current trend of I.C.T in most countries in the African sub-region is more persistent to achieving the goals set by our development partners. In Ghana and the rest of the regional bloc for instance, successive governments have touted themselves with the achievement of the Millennium Development Goals (MDG) on I.C.T. The program in itself has its own good intentions; however because of its foreign formulation as its foundation, it fails to meet our interest first before others. The successes in innovation chocked by U.S.A, Europe, China, India and Singapore has been due to the fact that, these countries looked at their needs and demands first, before extending it to others.

Much of our commitments in achieving these goals have not been strong enough. One of the views sampled across the country's universities revealed that, majority of our prospective I.C.T graduates cannot say the country's I.C.T policy including other nationals from Africa as shown in the figure below.

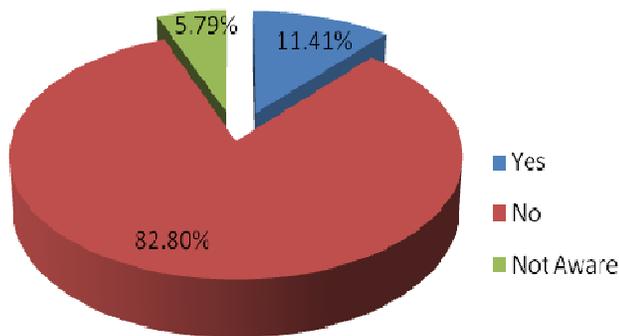


Fig. 3 Do you know the I.C.T policy on Education in Ghana?

We also believe that I.C.T policies should be based on our developmental goals rather than goals of foreign countries and institutions i.e. be informed by our needs rather than be dictated to by technology evolution and how others have achieved theirs. Thus we must adopt the technologies that are in consonance with our needs, values, and culture, with the view to empowering the citizens to become more productive, civil, and morally upright. As

## 6. Conclusion

In conclusion this paper postulated modules of I.C.T graduate at the level of proficiency and where focus of universities must be emphasized. It was realised that, because of the impractical oriented nature of the curriculum, most of the universities are unable to produce more of the Module 1 & 2 of the graduates. The second issue was in the area of a novel approach in addressing the I.C.T graduate un-employment termed 3-E-D. This is a multi-faced approach in reducing the I.C.T un-employment challenges which focuses on Education, Employment and Enrolment criterion for being employed. Above all, we also discussed the challenges of the I.C.T policies in the sub-region and the need for member countries in the sub-Saharan Africa to re-focus their objectives in order to make it possible for all and sundry to embrace.

## Acknowledgments

We thank the authorities of Valley View University for the funding in carrying out this research. We also acknowledge all the universities across the country who assisted us in diverse areas in completing this research.

## References

1. N.D. Oye, Inuwa Ibrahim, Muhammad Shakil Ahmad (2011), "Role of Information Communication Technology (ICT): Implications on Unemployment and Nigerian GDP", *Journal of International Academic Research*, Vol 11, No1. April 2011.
2. Kalaimagal R., Norizan M.Y., "Employment issues among Malaysian Information and Communication Technologies (ICT) graduates: A case study", *African Journal of Business Management* Vol. 5(26), pp. 10855-10861, 28 October, 2011
3. Global Employment Trends 2011, "The challenge of a jobs recovery", ILO Cataloguing in Publication Data, International Labour Office · Geneva (2011)
4. Report of the meeting on "A multi-stakeholder approach to address graduate unemployment" Bangkok, Thailand (2007)
5. Yidana, Alhaji Issifu & Ampiah, Michael E., "The Role of Information Communications Technology (ICT) in National Development: The Challenges for Our Society". *Mathematics Connection* Vol. 3, 2003

7. Akinyemi, S. (PhD), Ofem, I. B. (PhD), Ikuenomore S.(M.ED), "Graduate Turnout And Graduate Employment In Nigeria".

**Edward Danso Ansong** is a renowned research fellow in the field of Computer Science & Engineering. He had his Bsc (Hons) in Computer Science in Ghana (2006) and his Master of Engineering (M.E.) in Computer Science & Engineering at Karunya University, India (2008). He has 11 publications to his credits at both International Conferences and Journals mostly in Computer Security. He has won several awards in research and the recent one is the Best Research Award at an International Conference on Cloud Computing & Services in India (Dec. 2011). He is currently a senior lecturer with Valley View University, Ghana and a member of Computer Society of India (CSI).

**Emmanuel A. Affum** is a lecturer and researcher whose work spans several years. He had his undergraduate degree in Electronics and Communication Engineering in Ghana (2007) and completed M.Tech in Electronics & Communications Engineering from SRM University, India (2009). He has a number of publications to his credits in both International Journals and Conferences, including IEEE mostly in Communications. Mr. Affum is currently a lecturer with Kwame Nkrumah University of Science and Technology, Ghana.

**James Ben Hayfron-Acquah** is a senior lecturer and currently the Head of Department (HoD), Computer Science at Kwame Nkrumah University of Science & Technology (KNUST), Ghana. He holds a Bsc in Computer Science from KNUST, an MSc in Computer Science from Shanghai University of Science and Technology, China and a PhD in Computer Science from University of Southampton in the United Kingdom. Dr. Hayfron-Acquah is a consultant to the National Accreditation Board in Ghana in Accrediting Computer Science programmes and related fields in Ghanaian universities. He has several publications to his credit mostly in Image Processing and won several awards accordingly.