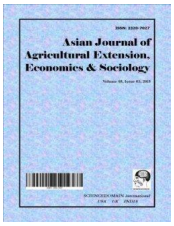

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Innovation and Employment Generation for Universities and Agricultural Colleges Graduates in Ghana: A Case Study

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

In recent times over 50% of graduates from universities and agricultural colleges in Ghana, do not gain employment upon completion of their education. This research finds out how the agricultural colleges could be repositioned such that their graduates will be self-employed upon completion of their education. In this research, I deployed a qualitative research method and concluded that: the agricultural colleges should establish an entrepreneurship hub in their respective colleges to train students on how to exploit their entrepreneurial intent so as to establish their own business upon graduation from their respective colleges. Secondly, I established that information communication technology is fast growing in developing countries and therefore students entrepreneurial activities should also focus on the development of information communication technology platforms to aid the agricultural sector in information dissemination and usage by farmers.

Keywords: Entrepreneurship; agricultural colleges; information; communication technology.

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1. INTRODUCTION

Over the years it has always been a problem for students from agricultural colleges to gain employment after school due to the limited and unavailability of public and private sector jobs. Furthermore, they are unable to develop their own businesses due to lack of appropriate entrepreneurial skills and ability to collaborate with mobile applications developers to develop information communication and technology (ICT) applications for agricultural purposes. This research, therefore, intends to interact with the staff of Kwadaso Agricultural College, Ejura Agricultural College, Ohawu Agricultural College and Damanago Agricultural College so as to identify their weaknesses. The aim of this research is therefore to identify the training needs and gaps of the staff of these agricultural colleges, so as to train them accordingly to enable them to focus on hands-on practical entrepreneurial and ICT training instead of theoretical training that most lecturers are used to which does not provide employable skills. This research, therefore, highlights on strategies that the staff of these agricultural colleges could deploy so as to embed employable skills in their students and also enable them to express their latent entrepreneurial skills which with the help of the lecturers and the establishment of an entrepreneurial hub will enable the students to establish new businesses.

2. DESCRIPTION OF THE PROBLEM

Previously in Ghana, the students from the agricultural colleges upon graduation are absorbed by the government and posted to the various districts in Ghana to aid the farmers in agricultural extension services. This means that the government of Ghana was responsible for posting and paying of salaries for these graduates. However, in recent years the government has changed the policy, such that the graduates from these institutions have to search for their own jobs. The new government policy, however, failed to provide an alternative employment root for these graduates. This policy, therefore, rendered the agricultural graduates unemployed. Furthermore, Information, Communication and Technology (ICT) is a formidable tool, used by many developed countries [1]. Thus, research, academia, and industry practitioners [2] to reach out, as well as disseminate knowledge and expertise to target groups, communities and individuals in the last two decade [3]. Yet ICT is not deployed effectively in many developing countries of which Ghana in part to harnessed the advantages it poses thereof.

In Ghana, just like other developing countries in Africa, there is approximately 44% of unemployment of employable youth [4]. This tends to distort the effort of the country to fully utilize its human resources. The reason for this problem is that a practical visit to some universities and colleges in Ghana reveals that they only provide academic programs and lack programs that emphasizes practical sections. Secondly, the universities lack entrepreneurial centres or hubs that will help students to initiate their entrepreneurial intents. As a result, the universities and colleges train students to depend on the government for employment which is unavailable or better still limited.

A practical visit and investigation on the four agricultural colleges mentioned above offer only agricultural related programmes which are to some extent practical but in most cases theoretically based, the limitations here is that they do not have entrepreneurship centres. This is so because the agricultural colleges lack an innovation lab and therefore the logistics for practical hands-on sections are limited.

Secondly, the agricultural colleges offer entrepreneurship as a course for their students. But without an innovative lab this become theoretical and therefore students are unable to benefit from the programme which makes them unable to express their latent entrepreneurial skills.

Indeed this is a national problem, and it has an indirect effect on the nation because the economic development agenda of the nation cannot be achieved with graduate unemployment as high as 44%. The Nation is therefore very much interested in innovations which will increase employment status of graduate students [5]. The recent scourge of the inability of students to gain jobs after completion from most Ghanaian universities and colleges has resulted in most students resorting to attend Technical universities where technical skills are emphasized and self-employment is assured. This new development has drastically lead to a reduction in the student enrolments in most agricultural colleges and universities. Therefore for the agricultural colleges to be able to remain competitive and produce employable graduates into the public and private sectors as well as for

students to become self-employed after completion of the programme, there is the need for the establishment of an entrepreneurial innovative lab, coupled with training on ICT for agricultural development. The objective of this research is, therefore: To identify the best practices in some universities that lead to job creation for their students. To identify the need for entrepreneurial skill training in academic institutions. And what is the skills gap between industry and academia, and how this gap can be bridged.

3. LITERATURE REVIEW

Rwanda is the leader in ICT4 Agriculture in Africa. The country was the second country in Africa after Namibia to introduce 4G high-speed broadband. This became possible because the country got involved in ICT and launched a network that provided high-speed broadband access to 95% of Rwanda's within 3 years [6]. With this, the country was able to achieve its vision 2020 objective of developing a path that seeks to transform the country into a middle-income ICT based economy.

This ICT network launch led to a rapid growth of Rwanda's mobile phone usage from 6% to 60% in just five years, which ultimately lead to the transformation of the Agricultural sector [7]. Rwanda is not the only country in the ICT development agenda. Other countries include Kenya, where agricultural business is booming due to the influx of many agricultural web applications, [8] an example is Susan Oguya and Jamila Abas, founders of Akirachix, together they developed a mobile phone application called M-Farm, for farmers in the rural areas. Also in Kenya, a mobile phone application called iCow was developed by the Dreams Tech. This application includes a cow calendar for the use of small-scale dairy farmers. With this calendar, farmers were able to register their cows by gestation dates and SMS alerts sent to them as to when to use artificial insemination. Since the set-up, over 128,000 Kenyan dairy farmers have benefited. The iCow application, on the other hand, helps farmers to increase milk production by 2-3 litters a day, thus increasing income by USD30 per month. Fishing communities were not left out, they are also benefiting from ICT's. An example is a mFisheries mobile and web application developed at the University of West Indies. In Trinidad, this application is used to improve the efficiency and welfare of small-scale fishers. By using a smartphone, fishermen are able to access weather reports, navigational tools, training tips and first aid and emergency boat repairs. The applications can also be used to find out fish prices in different markets, [9,10].

In Ghana, farmer-line provides farmers with weather information, market information and other services that increase the efficiency and productivity of the farmers. More interestingly, Ensibuuko, from Uganda developed a mobile and web application, which enables cooperatives societies of smallholder and rural farmers to mobilize savings and receive and disburse loans. Furthermore, there is an all-women group called Agrinfo, in Tanzania which developed a web-based and geographic information system and platform for mapping farms. Last but not the least, the Ethiopian resource centre for farmers delivers information via radio, SMS, and the internet to farmers. This is also true in Uganda where information relating to agricultural seed for maize, beans, and groundnut that provide improved yield and market information is provided by FM radio stations [11,12].

But the problem is that there is lack of collaboration among developers, this is a major challenge that needs to be urgently addressed. This is because the lack of collaboration leads to more investment in ICT in various counties which otherwise would have been imported from other countries at a lower cost [13]. Furthermore, the applications imported from others countries have been proven and tested hence less money will be involved in pretesting. There is therefore the need for networking of global application designers so as to learn from each other and build on knowledge developed by others.

Some African countries have developed successful ICT for Agricultural (ICT4Agric), policies, notability among them are Rwanda, Kenya, Uganda and Cote d'voire, [14,15]. It will, therefore, be appropriate to study their applications and amend them to suit other African countries instead of developing new applications which are costly.

According to [16] entrepreneurial human capital refers to an individual's knowledge, skills and experiences related to an entrepreneurial activity. Entrepreneurial human capital is important to entrepreneurial development [17,18,19]. The Resource Based Theory (RBT) explains the importance of human capital to entrepreneurship. According to RBT, human capital is considered to be a source of competitive advantage for

entrepreneurial firms. Focusing on a developing country context, [20] point out that lack of entrepreneurial education and training have reduced management capacity in SMEs in most African countries. Unfortunately, this is the case in Ghana as well. Entrepreneurial training and education can be enhanced with the establishment of an entrepreneurial hub. However, the absence of this hubs in colleges and universities is therefore, one of the reasons for the low level of entrepreneurial creation and the high failure rate of new ventures in Africa. Lack of entrepreneurial skills, experience and knowledge are also key limiting factors for entrepreneurship in most African counties. SME owners in most African countries often lack the expertise, experience and training related to the business they establish. Because of the managerial deficiency, there is the prevalence of non-survival of SME's compared to opportunity entrepreneurial activities most African counties creates. As a result necessity entrepreneurs prevail in Africa, in that they are forced to start a business in order to survive, as against opportunity entrepreneurs in developing countries who start a business as a result of a need gap or an opportunity they identify.

4. METHODS

I used three main approaches to collect the data, from the sample size of 80 respondents randomly selected; thus focus group discussions, interviews via Skype and phone, and one-on-one interviews, I then transported the data to Atlas.ti software for analyse, I used content analysis to derive important quotes and sentences from the various interviews the results of this research was then presented. For the Focus group discussions, interviews and information interactions were the main tools used. Specific case studies and interventions from universities, research institution and a farmer growers associations were deployed. The rationale for deploying these tools and using these institutions was to explore synergies and variations that might exist in the in various institutions regarding the use of ICT for agricultural development and the use of an entrepreneurial innovative lab to inculcate entrepreneurial intent within students and to motivate them to initiate their own business. To achieve his a mixed method questionnaire was developed to take both quantitative and qualitative data to support the research questions. Phone and Skype interviews with experts, and practitioners, where applicable, were used to generate further insights.

In answering and solving these problems, We selected two universities, one which has its students readily employed upon completion of their education, whiles the other has challenges with graduate employment. In each of these universities, 5 students and 5 lecturers each were randomly elected for interviews followed by a focus group for the two universities (5 students and 5 lectures for each university, totalling 20 respondents). In a food research institution, I interviewed 20 staff members and finally 20 farmers from a tomato farmers association were all sampled randomly for a survey and questioning on challenges related to launching and entrepreneurship and an innovative hub, and how to establish an efficient and effective innovative entrepreneurship lab and deploy the knowledge in ICT to reduced unemployment rates of graduates from our agricultural colleges. To answer these questions we interviewed and interacted with the following.

a) A Science and Technology University, which is an institution where students find it difficult to gain employment after graduations and also unable to start their own businesses, just like many other universities and agricultural colleges in Ghana. In this institution, I deployed 5 lecturers and 5 students for a focus group discussion and a further 5 students and 5 lecturers for one-on-one interviews. This method of triangulation was deployed so as to gain in-depth knowledge and information from the respondents. Different researchers have used group sizes ranging from 3 to 12 participants, depending on the purpose of the focus groups [21,22]. In this research, 2 separate focus groups discussions, made up of 10 participants from each university was done.

b) A Private University, This is an institutional leader in the operation of an entrepreneurial innovative lab. In this institution, 5 students and 5 lecturers were selected at random and interview on one-on-one bases, followed by a focus group discussion for 5 lecturers and 5 students.

c) The third institution was the staff of a food research institute (agri-food sector) in which I engaged 20 staff members for the interviews on one-one bases.

d) The fourth and final organisations are the Tomatoes farmers association in the Brong Ahafo Region of Ghana where interviews were done via phone and skype calls for all 20 farmers. This method was used due to dispersed

nature of farmers all over the Brong Ahafo region of Ghana.

5. DISCUSSION OF RESEARCH FINDINGS

5.1 A Science and Technology University

Our discussions, interactions and focus group discussions for all 20 participants, 13 females and 7 males revealed that, the alumina department for the first five years of its establishment since 2004, had most of its students gaining employment either to private or public institutions on completion of their programmes.

However, since 2012, the number of students employed to either public or private institutions on completion of their studies has reduced drastically. And students who are able to start their own businesses is less than 2% per annum. This is as a result of lack of entrepreneurial skills training to initiate their own businesses and lack of ICT skills to collaborate with other partners to develop mobile applications which are in high demand lately. Students inability to gain employment is also coupled with an increased number of universities and consequently university graduates in the job market over the past years have increased dramatically resulting in the supply of graduates being more than the demand. The competition for job has, therefore, become fierce with lots of foul play mechanism in recent years. In solving this canker, the university has initiated the establishment of innovative and entrepreneurship lab, coupled with the practical lessons in ICT application development. The Science and Technology University has also developed a collaboration with youth business entrepreneurship (YBI) from UK, which will provide funds for start-up and also provide technical advice and tutorial for Lecturers. From the view point of the university, these two strategies will be an engine of growth for initiating self-employment in their students.

5.2 The Private University

All 20 participants, 11 males and 9 females from the private university, confirmed that the university has established an innovative lab funded by the World Bank. This lab is equip with all equipment's in relation to student's field of study. The lab is manned by expert facilitators that have expertise in identifying each students entrepreneurial intents and help them to exploit it. Majority of the facilitators are drawn from abroad. And the equipment required are recommended by them. It is a policy of the institution that every student that graduates from the university develops his or her own business, and the business is started whiles the students are still in school. These students are also exposed to millions of donor funding websites and thought on how to source for donor funds to supplement their working capitals.

They further indicated that the entrepreneurial hub in their university is funded by donor funds and supplemented by internally generated funds from the university. Students whiles on campus win contracts and their facilitators help them executes such contract which generates income for the university. The university is also affiliated to Netherlands fellowship organisation (SNV) an international organisation in the Netherlands which provide grants and technical support for students to start their own business. This explains the high fees of 5,000 dollars charged per semester per students. A student told me 'one of my colleagues had admission to University of Science and Technology, (UST) but deferred his admission for 3 successive years just to be admitted to this private university" this shows the competitiveness of being enrolled into such a private university'

Upon interacted with the students, I learnt that Industrial attachments in this university are unique, in that every year industries sends memos to the university requesting for university students to be attached to their institution. This is unique because in other universities of which all the agricultural colleges are part is that, students search for the institutions that are ready to take them for attachments which in most cases is frustrating. As a result of the unique nature regarding industry players seeking for students to do attachments with them, over 40% of their students remain or gain employed with these various institutions. Further to this those that could not gain employment about 60% establish their own businesses before graduating.

According to facilitators in the entrepreneurship department, the rate of employment after attending this university is quite high over 40% besides almost every individual establishes his or her own business whiles on campus because of the presence of the entrepreneurship hub and hands-on entrepreneurial tutorial which engineers the entrepreneurial intent of the students. They also indicated that this university

just like most university in Ghana today has exchange programs but what is unique about this private university is that most student happens to have the opportunity to pitch their entrepreneurial business ideas at international forums and conferences which in most cases get funded.

5.3 A Food Research Institute

Discussion with the randomly selected 20 staff members, 15 males and 5 females from a food research institute revealed that they do not have a well-resourced marketing team within the entrepreneurship /innovative department as a result most of their innovation remain on their shelf because there is no motivation to market the innovative ideas. They indicated that development of a simple mobile application could make assessable to the public all the products and technology but the motivation and skills required to champion such a noble idea is lacking. Development of both mobile and web applications is, therefore, the key to reach out to their consumers.

They emphasised that there is, therefore, a huge skill gab regarding the development of web and mobile phone applications. Attachments of food research staff to farmer-line which have mobile phone applications that provide farmers with weather information, market information and other services that increases the efficiency and productivity of the farmers will help enormously. These sort of attachment will therefore grant the exposure and skills to be explored from farmer-line and the possible incentive for collaboration and design of applications.

5.4 Tomatoes Farmers Association (Brong Ahafo)

20 tomato farmers, 12 males and 8 females were also interviewed and their major concern was about the lack of adequate and immediate markets for their produce. They complained that due to the perishability nature of their produce most of the produce go waste as they find it difficult to locate markets. As a result the middle men who are not farmers buy the produce at very cheap prices from their farm gates and sell at higher prices. Further discussions with the farmers revealed that graduates from the agricultural colleges (their extension officers) are very few and lack skills in information communication technology (ICT) which they could deploy in the development of mobile phone applications to enable them locate markets. What makes the situation worse is that, the agricultural extension officers are no longer available since the government does not engage them any longer after graduating from the agricultural colleges. Uganda and Rwanda have developed mobile phone applications for various agricultural activities [23,24]. The curriculum of the Agricultural institutes therefore needs to be refocused to include strong ICT skills development of their students to be able to identify agricultural technological gaps so as to be able to solve them.

6. CONCLUSIONS

The increasing unemployment rates in Ghana calls for the agricultural colleges to inculcate practical and hands-on innovative entrepreneurship into the curriculum. These I believe will go a long way to enable students establish their own businesses whiles on campus. This confirms to the findings of [5] who stated that the Nation is very much interested in hands-on training and innovations which will increase the employment status of graduate students. Furthermore, [20] point out that lack of entrepreneurial hands-on education and training have reduced management capacity in SMEs in most African countries including Ghana as well. Effective hands-on training is therefore the key to liberation from unemployment. Donor funds are also needed in this regards to enable starters get access to funds to start their business.

Furthermore, ICT is developing very fast in neighbouring African countries, it is therefore prudent for Ghanaian agricultural colleges to follow suit so as to bridge the gap of inadequate ICT applications in the agricultural sector. The conclusion for this research is in accordance to that of [14,15] who also concluded that, it would be appropriate to study the applications of some developing countries and amend them to suit other African countries instead of developing new applications which are costly. Furthermore, effective collaboration among developing countries may remove barriers to effective deployment of applications developed in these countries, this was also confirmed by [13].

Also, marketing skills in agricultural colleges need to be emphasised, this is because, the case of the food research indicated that marketing of technology is a problem, and therefore most of the technologies they develop remain on the shelf. However, these technologies could be in the public domain

through the use of ICT applications. Furthermore, exchange programmes between agricultural colleges students in Ghana with their counterparts in Rwanda, Kenya, and Uganda could also bridge the ICT technological gab through effective collaborations to develop applications.

7. LIMITATIONS AND FUTURE RESEARCH

He results of this reach cannot be generalized due to the small sample size, besides only two universities and two institutions were sample. A further study to include more universities and institutions is recommended to authenticate this results.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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