

Developing an Online Agribusiness Certificate for Sub-Saharan Africa

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Abstract

Agribusiness is a worldwide industry in need of qualified people. However, many of those engaged in the business of agriculture in Sub-Saharan Africa (SSA) lack the training and education to advance their career or improve income-earning capacity. Currently there is a disconnection between the skills needed in SSA and those provided by graduates. Research was conducted to determine the needs of the SSA agribusiness industry. This paper reports those research findings and proposes a BYUI agribusiness certificate program built around the skills that the SSA industry deems necessary. The BYUI certificate will provide graduates with the knowledge, skills and experiences needed to enhance employment or increase personal income

Keywords: agribusiness skills, agribusiness certificate, online programs, *Pathway*, peer-mentoring student partner, Sub-Saharan Africa.

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1. Introduction

During the previous decade, greater access, availability, utilization, and stability of food improved world food security (FAO, 2013). Despite this improvement, countries with high poverty still experience high levels of food insecurity (FAO, 2013). In 2011-2013 the Food and Agricultural Organization of the United Nations (ESS, 2014) listed Sub-Saharan Africa (SSA) as one of the highest regional levels of poverty and consequently food insecurity in the world. Improving tertiary education in SSA will help develop human capital, stimulate economic growth and consequently contribute to food security in this region (Bloom, Canning and Chan, 2006) (World Bank 2008).

1.1. Role of Agribusiness Education in Sub-Saharan Africa

Specifically, agribusiness education can play a vital role in addressing the twin challenges of food insecurity and poverty in SSA. The agribusiness industry employs most of the populations in developing nations. In fact, 60-80 percent of the SSA population work in the agribusiness industry (World Bank, 2008). Most of these workers are part of the private informal sector and include those employed in production agriculture, agro-based processing activities, and urban food traders. However, many engaged in the business of agriculture lack training and education to advance to a higher level of employment or improve their income earning capacity.

Chakeredza states:

Sub-Saharan Africa's economic growth hinges on the development and promotion of a vibrant and sustainable agricultural production base.Central to making these components operational is the production of suitable graduates, who are (i) technologically competent and relevant, (ii) equipped with the necessary "soft skills" and business skills and (iii) able to work in local and rural communities" (Chakeredza 2008)

Developing human capital in the agribusiness sector has the potential to improve farm incomes, increase food production, and stimulate value added activities. In other words, improving agricultural education should positively impact employment and economic growth in Sub-Saharan Africa.

1.2. Agribusiness Educational Challenges in Sub-Saharan Africa

Tertiary agricultural education in SSA has many challenges. Currently, there is a disconnect between the skills needed by industry and those provided by graduates. Chakeradza explains that in the past most agricultural education was geared towards producing government employees. Curriculum was narrowly focused on science and technological skill development, relied on rote memorization of facts, and lacked local context. Additionally, industry didn't participate in

curriculum development and students had limited practical farm experiences. This system produced graduates ill prepared to operate an agribusiness agricultural enterprise (Chakeredza et al. 2008).

2. Purpose and Objectives

This paper examines potential benefits of establishing an online agribusiness certificate and proposed curriculum for students and other interested individuals in Ghana. This research has two main objectives; first identify the perceived benefits of an online university level certificate on employment and wages. Second, gain input from the agribusinesses industry participants regarding the skills needed for success by entry level managers and small agribusiness owners. This paper examines the SSA agribusiness industry needs and proposes a BYUI agribusiness certificate program built around the skills that industry deems necessary. The BYUI certificate will provide graduates with the knowledge, skills and experiences needed to enhance employment or increase personal income.

A unique aspect of this certificate is the collaboration between various entities including: the online degree programs at Brigham Young University-Idaho (BYUI) and its partner program *Pathway* as well as specific NGOs, Ghanaian academic institutions, and businesses. The BYUI *Pathway* program is a low-cost educational opportunity that combines online courses with local gatherings and is aimed at helping individuals in disadvantaged educational circumstances.

3. Procedures/Methods:

In the summer of 2014, BYUI conducted a modified Agribusiness Management Aptitude Skills Survey (AGRI-MASS) in the greater Accra region of Ghana. The survey instrument was similar to the AGRI-MASS survey conducted in the U.S. by Litzenberg and Schneider in 1987 (Litzenberg et al 1987). Each respondent used a five point Likert scale to rank 61 different parameters organized into six areas: business and economic skills, technical skills, communication skills, computer and quantitative skills, personal qualities, and employment and work experience. Respondents ranked the parameters in order of importance for either an entry-level manager or an owner operator of a small business. Additional questions regarding employability and wages were also included in the survey.

Local contractors in Accra familiar with Ghanaian agribusinesses reviewed the survey instrument to ensure questions were appropriate. They conducted face-to-face interviews with local farmers, agribusinesses, government agricultural organizations, and educational institutions. The local contractors in Ghana identified survey respondents and completed 68 usable surveys. Of the completed surveys 38 percent of the respondents were involved in production agriculture, 35 percent were government and educational institutions, 18 percent were agribusinesses, and 9 percent were financial institutions, Table 1.

Table 1. Survey Respondents Segmented by Industry

	% of Total Respondents	% Category
Production Agriculture	38%	
Primarily focused on crop production		45%
Primarily focused on livestock production		55%
Primarily focused on milk production		0%
Other		0%
Agribusiness	18%	
Agricultural importer/exporter		33%
Agrochemical / fertilizer supply company		22%
Food or beverage processor		33%
Agricultural machinery and equipment dealer		0%
Food or beverage retailer		0%
Other		11%
Government and Educational Institutions	35%	
Agricultural government agency		64%
Agricultural education institution		27%
Non-agricultural government agency		0%
Non-agricultural education institution		9%
Other	9%	
Mining		0%
Construction		0%
Manufacturing		0%
Wholesale		0%
Retail		0%
Finance and Insurance		100%
Scientific or Technical Services		0%
Real Estate, Rental and Leasing		0%
Communications		0%
Transportation and Warehousing		0%
Professional Services		0%

Most respondents (59 percent) employed more than 50 people, while approximately 26 percent had 1-5 employees. A few respondents (14 percent) had 6-50 employees. Most respondents (32 percent) identified “Other” as their job title. This was a concern; however, the local contractor explained that most were human resource managers. Seventeen percent of respondents were Chief Technical Advisers, followed by Owner Operators (16 percent), Farm Managers (15

percent), District Officer (9 percent), Management (8 percent), Production Manger (3 percent), and finally Faculty (1 percent).

The selection process for survey participants was not random; therefore, some bias exists. The local contractors found individuals through value-chain acquaintances or from previous acquaintances through employment and other research projects. Although, the results of the survey may not represent the entire Ghana agribusiness industry, they are similar to other surveys conducted in the United States (Litzenberg et al. 1987), Australia (Fairnie, Stanton, and Dobbin, 1989), and Uganda (Breazeale et.al.2004).

4. Results

The survey results indicate a need for formal educational training in agribusiness management and indicate that a successful graduate of such a program will likely experience enhanced employment opportunities as well as increased personal income, Table 2 and Table 3.

Table 2. Completion of a University Level-Certificate Effect on Employment

	Response
No change to employability	2%
Employability would increase by 50% or less	53%
Employability would increase by over 50%	45%

Table 3. Completion of a University Level-Certificate Effect on Wages

	Response
No change in hourly wages	3%
Wage should increase by 1-25%	45%
Wage should increase by 26-75%	47%
Wage should increase by over 75%	5%

Table 4. General Skills Category

	Average Score	Rank
Personal Qualities	4.02	1
Communication Skills	3.54	2
Business and Economic Skills	3.33	3
Computer and Quantitative Skills	3.21	4
Technical Skills	3.04	5
Employment and Work Experience	2.22	6

(where 1=lowest in importance and 5 = highest in importance)

In addition, to the six general categories, survey participants ranked *personal qualities* as the most important, followed by communication skills, business and economic skills, computer skills, and technical skills, see Table 5. Respondents ranked past employment/work experience as least important, Table 6.

Most industry participants agreed on order of preference; however, financial institutions did vary slightly by ranking business and economic skills higher than communication skills. The small sample size from financial institutions may help explain this variation. These general rankings were found to be consistent with the results of Litzenburg and Schneider 1987 in United States (Litzenburg et al. 1987); Fairnie, Stanton, and Dobbin 1989 in Australia (Fairnie et al 1989); and Breazeale, Mangheni, Erbaugh, and Mbowa 2004 in Uganda (Mangheni et al. 2004).

While most participants agreed on the general order of preference, within the technical skills category, the survey participants disagreed about which technical skill were important. For instance, agribusinesses ranked understanding of food preparation/hygiene as the most important technical skill; whereas, production agriculture identified understanding of machinery/equipment repair and maintenance as the most important technical skill. Government and education identified understanding livestock production as the most important technical skill. Finally, financial institution ranked understanding of crop production as the most important technical skill. There were also some ranking differences in the business and economics skills category. However, the small sample size in each area renders the category differences insignificant. Education, agribusiness and government ranked *understanding the function and structure of the value chain* as the number one business and economic skill. However, production agriculture identified both *cooperative (group) marketing strategies* and *inventory management systems* as the number one business and economics skills desired. Respondents from the financial institution sector ranked *financial statement analysis* as the number one business and economic skill.

The results showed greater agreement amongst industry types within other categories; for example, all participants ranked *basic math skills* (i.e. addition, subtraction, etc.) as the most important skills in the computer and quantitative category. With the exception of the agribusiness sector, all industry types identified *positive work attitude/personal/ability to work hard* as the most important personal skill.

Work experience was ranked lowest by all four industries. However, those working in production agriculture ranked *employment (experience) in production agriculture* important. Additionally, agribusiness and financial institutions believe that employment in an agribusiness is important. One unanticipated result was respondents from financial institution ranked employment with an agribusiness operation much higher than employment with a financial institution.

The top ten most important skills identified by the survey participants as a whole were: positive work attitude/personality/ability to work hard, loyalty to the organization, work with other and be a team player, and problem solver, speaking clearly and concisely on technical information, high moral/ethical standards, read and understand specific technical information, self-motivation. Seven of the top ten skills are considered *personal qualities* with the remaining three associated with the *communication skills* category, Table 5.

Table 5. The Top 10 Most Important Skills Desired by Survey Respondents

Most Important Individual Skill Categories:	Average Score	Overall Rank
Positive work attitude/personality/ability to work hard	4.30*	1
Loyalty to the organization	4.11*	2
Work with others and be a team player	4.08*	3
Problem solver	4.07*	4
Speak clearly and concisely on technical information	4.02*	5
High moral/ethical standards	4.01*	6
Read and understand specific technical information	3.98*	7
Self-motivation	3.95*	8
Give clear and concise instructions to others	3.94*	9
Provide leadership and make decision	3.92*	10

(where 1=lowest in importance and 5 = highest in importance) *Significant at the .01 level where significance tests whether the average response is significantly different from the mean for all responses. The p-value given is for a two-tailed test since the deviation from the mean can be both negative and positive.

The skills identified as least important were: employment with an international firm, employment with a financial institution, employment with a retail business, employment with a manufacturing firm, foreign language skills, employment in government/public affairs, employment with a wholesale business, employment with a domestic firm, understanding engineering, accrual accounting concepts (Table 6). Most of these skills are associated with work experience the three exceptions are accrual accounting skills, engineering skills, and foreign language skills.

Table 6. The 10 Least Important Skills Desired by Survey Respondents

Least Desired Individual Skill Categories:	Average Score	Overall Rank
Accrual accounting concepts and procedures	2.83*	52
Understanding of engineering	2.63*	53
Employment with a domestic firm	2.42*	54
Employment in wholesale business	2.32*	55
Employment in government/public affairs	2.23*	56
Foreign language skills	2.04*	57
Employment with a manufacturing firm	1.98*	58
Employment with a retail business	1.94*	59
Employment with a financial institution	1.48*	60
Employment with an international firm	1.45*	61

(where 1=lowest in importance and 5 = highest in importance) *Significant at the .01 level where significance tests whether the average response is significantly different from the mean for all responses. The p-value given is for a two-tailed test since the deviation from the mean can be both negative and positive.

The most important business and economic skills identified by the survey participants as a whole were: Understanding of the function and structure of the value chain, coordinate human and physical resources, identify and manage risk and uncertainty, ability to create a business plan, understanding of market systems, and financial statement analysis Table 7. These skills will provide the basis for the certificate, while incorporating activities to develop personal qualities and communications skills identified in Table 5.

Table 7. Most Important Business and Economic Skills	Average Score	Overall Rank
Understanding the function and structure of value chain	3.69*	16
Coordinate human and physical resources	3.64**	18
Identify and manage risk and uncertainty	3.60**	19
Ability to create a business plan	3.59**	20
Understanding of market systems	3.57**	21
Inventory management systems	3.54***	22
Financial statement analysis	3.53***	23

(where 1=lowest in importance and 5 = highest in importance) Significant at the .01*, .05**, .10*** level where significance tests whether the average response is significantly different from the mean for all responses. The p-value given is for a two-tailed test since the deviation from the mean can be both negative and positive.

5. Implications/Conclusions:

BYUI is using the results of this survey to develop curriculum for an online certificate in agribusiness. This program will pilot in Ghana in Fall 2015 and Winter of 2016. The agribusiness certificate will include five specific courses and one practicum requirement Table 8. Concepts included in the certificate align with the survey results and cover topics in basic management and entrepreneurship, economics and budgeting, cash accounting, marketing, and human resource/personal management.

Successful candidates will earn 14 educational credits Table 8. This certificate is not a degree, but provides online learning opportunities in basic agribusiness skills useful for careers in agriculture and related agribusiness industries. The practicum component requires a “hands-on” experience where the students work with an approved agribusiness provider to gain experience in the normal day-to-day operations. Each course in this certificate will incorporate the following activities to develop the skills identified as important in Table 5 and Table 7:

- Case studies
- Group projects
- Presentations
- Application activities

Each of these activities will focus on the needs of students in developing economies to insure relevance. Ongoing reviews will help identify challenges and facilitate changes in curriculum. Evaluations and additional support will come from a “peer-mentoring student partner” at the BYUI campus. The BYUI student mentor will interact with the Ghanaian certificate-seeking-candidates through technology; such as Skype, Face Time, Google Hangout etc. Uniquely following BYUI’s *Pathway* model, the online students will “gather” once a week to review assignments and lesson concepts and build a network of relationships that will benefit them in their career path. The weekly gatherings will be organized and led by volunteer business leaders who are interested in promoting and building the agribusiness industry. The *Pathway* weekly gathering model is successful in Ghana as well as in other countries.

Table 8. Prosed Agribusiness Certificate

Course Title	Course Number	Credits
Introduction: Entrepreneurship in Agribusiness	AGBUS 105	3
Introduction: Economics and Budgeting Principles	AGBUS 180A	2
Introduction: Cash Accounting Concepts and Applications	AGBUS 180B	2
Introduction: Marketing Concepts and Applications	AGBUS 147	3
Human Resource & Personal Management	AGBUS 138	3
Agribusiness Practicum	AGBUS 198R	1
Total Credits		14

Students may use this certificate as a component of the online associate and bachelor degrees offered at BYUI. According to the results of this research in Ghana, graduates of this agribusiness certificate should find enhanced opportunities in agribusiness entrepreneurship, increased employment opportunities in the agribusiness field and improved earnings. Because the BYUI program was developed around industry needs, completing the BYUI agribusiness certificate has the potential to enhance the career opportunities for many who cannot afford to complete an associate or bachelorette degree program.

In summary the potential benefits to the students in SSA who complete this program are:

- Improved “soft skill” development (Problems solving, ethics, team work, leadership)
- Enhanced communications skills (Oral, written, and comprehension)
- Greater understanding of the function and structure of agricultural value chain
- Improved understanding of market system
- Better understand of financial analysis
- The ability to complete a basic business plan
- Greater understanding of entrepreneurship

6. Additional Research Needs

BYUI will conduct ongoing evaluations with corresponding adjustments to the certificate program. For instance, during the “pilot” of the certificate courses an ongoing evaluation process will be implemented. The evaluation process will track student progress, collect student input and evaluate their level of understanding and mastery. BYUI will use specific evaluation metrics to determine if the certificate program does indeed meet the expectations and objectives of the course. Adjustments will be made on a continual basis to improve and maintain the integrity of the program. Following the pilot in Ghana, BYUI will evaluate the potential of expanding this certificate to other developing nations in conjunction with its Pathway program.

Finally, BYUI will repeat this survey research to identify changes that may be observed over time.

Type of Presentation Requested: We request that this proposal be considered as a paper presentation in the symposium portion of the conference.

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