Curriculum needs to meet New Agriculture imperatives: A Case Study Eastern Caribbean Institute of Agriculture and Forestry (ECIAF), Trinidad

Marcus N. A. Ramdwar
Instructor II, University of Trinidad and Tobago
e-*mail:* marcusramdwar@tstt.net.tt

Wayne Ganpat
Lecturer, University of the West Indies, St. Augustine
e-mail: waygan@flowtrinidad.net

Abstract

Governments in the region are taking action to transform its agriculture sectors and it is important that agricultural professionals meet this challenge. The Eastern Caribbean Institute of Agriculture and Forestry (ECIAF) in Trinidad prepares a significant portion of the para professionals in the region. This study evaluated (1) the perceived level of preparation graduates (n=100) have about their training at the ECIAF and (2) their competency gaps and (3) their job satisfaction. A self reporting survey instrument was used and data analysis involved mainly descriptive statistics and means' comparisons using SPSS v.17.

The results indicated that (1) there is a deficiency in the non-traditional areas of the curriculum particularly with preparation for the new agriculture: sustainability, food safety and value addition (2) that while respondents were generally satisfied with their job, they were unhappy with training opportunities and promotion. The current study reveals that there is a gap between what the curriculum provides and the futuristic realities of the sector.

It is recommended that, given the disconnect between curriculum and strategic initiatives for new agriculture in the region, curriculum modification would be required to prepare a well-trained workforce for a competitive, profitable and sustainable agriculture in the region.

Keywords: curriculum, value-added, job satisfaction

Introduction

In 1954 the Eastern Caribbean Farm Institute was established. The name of the Institute was changed in 1971 to the Eastern Caribbean Institute of Agriculture and Forestry (ECIAF), as it is known today, to reflect the introduction of the Diploma in Forestry. From1964 ECIAF has operated as a Trinidad and Tobago Institution, a change that has never interfered with its regional character in relation to function and student intake.

In 2000 ECIAF was incorporated into the College of Science, Technology and Applied Arts of Trinidad and Tobago (COSTAATT) and from September 2002 the Diploma in Agriculture was replaced by the Associate in Applied Science Degree in Agriculture with a modified curriculum. In 2006, as of Cabinet note dated September 28th 2006, ECIAF was integrated into UTT as part of its Food and Agriculture programme and the governance structure at the Institute was modified once again. However, through all its incarnations, the

main objective of ECIAF was to train para-professionals in the sphere of agriculture and forestry.

In addition to nationals of the twin republic of Trinidad and Tobago, it provides training for agricultural professionals mainly from St. Vincent and Grenada. It is not primarily limited to these islands as students from other islands enroll occasionally.

Scanlon, Bruening and Cordero (1996) indicated that in the last three decades, improvements in science, technology and communication have caused remarkable changes to occur in agricultural industries and related job fields. Agriculture is a rapidly changing industry and new advancements in science and technology provide dynamic opportunities for agriculture to address economic, social, and environmental issues in a multidisciplinary manner (Williams and Dollisso 1998). In many developing countries, especially in Sub-Saharan Africa, Asia and Latin America, the higher agricultural education system is experiencing serious problems of low quality, irrelevancy, lack of funding, poor infrastructure, low faculty morale, and high graduate unemployment (Maguire and Atchoarena 2003). According to FAO (Food and Agriculture of the United Nations 1997) the curricula used and teaching methods implemented have not always been relevant to the development objectives of individual countries, the needs of farmers, or the labour markets in general.

Agriculture and its various practices have been going through changes and are expected to change in the future especially with increase in technological and scientific knowledge (Egun 2009). However, Taylor (1999) pointed to one of the greatest problems facing agricultural training institutions is that the curricula they use are rigid and inflexible, not only in structure and content, but in the way in which they are developed. It has been reported that many colleges of agriculture are undergoing programmatic changes and are reexamining the philosophy underlying their missions (Graham 2001). The School of Agriculture of the Eastern Caribbean Institute of Agriculture and Forestry (ECIAF) in Trinidad and Tobago, West Indies has been encouraged to revise its curriculum to ensure that it responds to the demands for agricultural development not only in Trinidad and Tobago but the entire Caribbean (Hermsen 2000). It has been proposed that the curriculum of agriculture were generally out of date and should be changed (Krunkel Maw, and Skaggs 1996).

The Ministry of Agriculture (Trinidad), in their transformation plan from “agri-culture to agri-business” indicated that the agro-processing sub-sector is still at an infancy stage (Ministry of Agriculture Land and Marine Resources, 2008, 9). This current plan transforms primary production agriculture to the establishment of internationally competitive value-added agricultural-products. It is important that governmental agricultural policy is reflected in the agricultural training institutions in the country and that they respond by producing graduates that are ready to meet the current development needs of the country.

Purpose of Study

The purpose of this paper is to provide insight into the training as provided by the agricultural components of the curriculum at the ECIAF and to provide a baseline for possible improvement. The study assesses the perception of graduates with respect to overall preparation at the ECIAF and their level of satisfaction with specific curriculum content themes. The following specific objectives were identified:

1. To determine the perceived level of preparation graduates have about their training at the ECIAF.
2. To determine the competency needs of

ECIAF graduates.
3. To determine their general level of job satisfaction.

The results are expected to highlight the deficiencies in the agricultural programme at the ECIAF and to make specific recommendations for the preparation of a modern workforce in agriculture.

Methodology

Graduates from the ECIAF were randomly selected from lists obtained from the ECIAF of students who graduated in the last 5 years. The study intended to do a census of graduates, however, due to inadequate contact information; the final sample (100) represented 88% of total graduates for the period 2004 to 2008. The research instrument, a self-reporting, structured questionnaire was used to collect data. Instruments were mailed; hand delivered and sent electronically for completion.

The survey instrument was divided into four parts;

- Personal and job related information of the respondents.
- Assessment of preparation: respondents were asked to rate their satisfaction with their overall level of preparation at ECIAF using a satisfaction scale measured and scored as follows; Very satisfied (score =3), Satisfied (score =2) and Dissatisfied (score =1). The respondents were also asked to rate the training received in content specific areas. Responses were scored as follows; Very Good (score =4), Good (score=3), Fair (score= 2), and Poor (score =4),
- Job function requirements: Respondents to rate the importance of 9 critical content areas to present job functions and scored as follows; Very important (Score = 4), Important (Score = 3), Somewhat important (Score = 2) and Unimportant (Score = 1. Information for level of competence on job entry and level of competence at present anchored using the scale Very Good (Score =4), Good (Score = 3), Fair (Score = 2) and Poor (Score =1).
- Job Performance measure: Respondents were asked to respond to 10 job related statements to determine their overall job satisfaction. Scoring was as follows: Very Satisfied (Score =4), Satisfied (Score =3), Somewhat satisfied (Score =2) and Dissatisfied (Score =1). The items were reviewed for face validity by three colleagues in the field and thereafter adjusted. Data analysis involved primarily descriptive statistics and means comparison tests using SPSS v.17.

Results

Sample comprised;

Gender: of 54% male respondents and 46 % female respondents;

Age: the majority of the respondents were within the age group of 20-25 (49%) followed by the age groups 15-20 (31%) and 25-30 (17%) and no respondents for the age category ≥ 40;

Education: (9%) of the respondents had a Bachelors degree, (58%) Associate degree qualification, (32 %) for diploma level, and (1%) for a masters qualification in agriculture;

Years of Service: The majority of the respondents (71%) had 0-2 years service. This was followed by (25 %) with 2-4 years of service. Some 4 % had ≥4 years service.

Job tenure: Contract employment randomly fielded the highest respondents representing 49% of the sample population. Temporary employment presented 40% of the

respondents and permanently employed respondents in the field of agriculture represented 11% of the sample population.

Employment: The majority of the respondents (42%) were from state assisted organizations followed by the private sector, (33%) and Government (Ministry of Food production) (25%).

Perception of Overall Preparation

Data show that 69% of the respondents perceived their overall preparation at ECIAF as very satisfactory and 31% of the respondents were satisfied. No respondents indicated dissatisfaction with their overall preparation at ECIAF. Mean overall preparation score was 2.69 (Very satisfied score=3; Satisfied score=2 and dissatisfied score=1).

Table I shows the ranked mean scores for all respondents (n=100) for the level of preparation in selected general thematic areas of the ECIAF agricultural curriculum. The results reflected higher perceived preparation in the areas of livestock (M=3.64), crops (M= 3.52) and soils (M=3.39). The thematic areas, farm management (M=2.93), extension (M=2.83), sustainable agriculture (M=2.72) and small machinery (M=2.69) were perceived as good with respect to the level of preparation. Food safety (M=2.06) was perceived as fair and value added received the lowest mean score of 1.63 for the perceived level of preparation by respondents for the training at ECIAF.

Table 2 shows the degree of importance for present job function. The results showed that extension was considered to be very important for the respondent's present job requirements and had the highest ranked mean score of 3.61. This was followed by crops (M=3.32), soils (M=2.98), sustainability (M=2.81), food safety (M=2.71) and farm management (M-= 2.70) in descending order with the degree of importance for job requirements. The thematic areas of livestock, machinery and value added had the lowest means scores of 2.50, 2.28 and 2.25 respectively.

Table 3 shows the relationship between the level of competence in select areas of curriculum content on job entry and at present. The results revealed that there was a significant increase in competence in all areas except soil and livestock areas. The area livestock (M=3.67) showed the highest degree of perceived level of competence upon job entry by the respondents. This was followed by crops (M=3.48), soil (M=3.39), extension (M=2.78), machinery (2.47), sustainability (2.43), farm management (2.14), food safety (2.13) and value added (2.08) which was perceived to be the respondents least level of competence.

Table 4 shows the level satisfaction for selected job satisfaction parameters. The degree of independence had the highest mean score of 3.41 indicating that the majority of the respondents were very satisfied with this job satisfaction parameter. This was followed with expressions of satisfactions for relationships with colleagues (M=3.05), diverse nature of the job, (M=3.04), physical work environment, (M=3.04), relationships with supervisors (M=3.0) and flexibility in scheduling work (2.99). Respondents were more than somewhat satisfied with the remuneration for the job (M=2.83) and the recognition received for the job (M=2.58). The respondents were moderately somewhat satisfied with the opportunity for skill development through training (M=2.42). Opportunity for promotion had the lowest mean of 1.92 indicating respondents being somewhat dissatisfied with this aspect of job satisfaction.

Discussion

Higher education in agriculture and natural resource management plays a particularly

significant role in national development (Maguire 2000). The major focus of tertiary agricultural education has been on the production of public sector employees (Muir-Leresche and Scull-Carvalho 2006). Given that the opportunity for promotion had the lowest mean value (M= 1.92) for the degree of job satisfaction, the impact of re-designing the training at ECIAF would possibly lead to shift from the culture of public sector job dependency to self employment. In spite of China's enormous population, Chen (2000) indicated that jobs for graduates are no longer guaranteed and the government can only hire approximately 50% of agricultural graduates. Jobs in the public sector were becoming increasing difficult and as such it is imperative that graduates in agriculture are equipped with the ability to be self-employed. The potential of an agricultural graduate from ECIAF to become self-employed would have an impact on the holistic development of the agricultural work force.

Generally the ECIAF graduate is moderately satisfied with their existing employment in the agricultural sector. However, if agricultural industries are to survive, the agriculture curriculum must be dynamic and able to adjust to new situations and environments that help to improve on-the-job effectiveness of future graduates (Coorts 1987; Slocombe & Baugher 1988).The curriculum content of the diploma programme in agriculture has pointed to major deficiencies in the areas of sustainable agriculture, food safety and value addition, as components of good agricultural practices. Although "value added" thematic area was reported by the respondents to be the least requirement for their current job, futuristic trends in agriculture would see this area becoming more of an essential component of agricultural curriculum. As Trinidad and Tobago and indeed the wider region seek to transform agriculture to the philosophy of agri-entrepreneurs there would be a need to address commodity value chain at raining institutions including the ECIAF.

Although the majority of the respondents were satisfied with overall level of preparation in the training at ECIAF in what can be described as the traditional areas, it was the non-traditional areas which were disappointing. The modernization of the curriculum to integrate the concept of value addition would complement the transformation of the agricultural sector to be entrepreneurial driven.

The thematic area of extension was highest (M=3.61) with respect to job requirement criterion. However, respondents perceived the level of preparation at ECIAF for extension as moderately good. As the agricultural sector takes a paradigm shift to entrepreneurialism it must take into consideration the extension aspect of this change. Peura, Siiskonen and Vesala (2002) indicated that farmers do not think of themselves as entrepreneurs. Agricultural extension in the curriculum delivery needs to be strengthened to provide a graduate with the ability to meet the sector's demands for entrepreneurism and market orientation among farmers. Farmers have to be an entrepreneurs and develop entrepreneurial culture that could enhance their productivity and the agricultural sector's productivity as a whole (Mohamed, Rezai and Shamsudin 2011). The entrepreneurial culture would only be reinforced by a sound base in agricultural extension education with the objective of creating this mind-set within the farming communities.

Egun (2009) indicated that futuristic education entails a projection of what education will help individuals to achieve in future. The dynamic nature of the agricultural discipline requires constant monitoring to enable timely changes in the agricultural curriculum agenda. Shao and Bruening (2002) stated that students' education has become more purposive

and selective, since it now must relate to their training and to employment opportunities in the labour market. The sector is now in a "catch up" mode to move steadfast to understanding and implementing the concepts of value addition and the market oriented principles in our agricultural transformation. Taylor (2000) indicated that major shifts in education are difficult to achieve, and usually are a lengthy process. In spite of this challenge it is important that curriculum review immediately commence to treat with the new direction of agriculture and new demands of its professionals in Trinidad.

Conclusion

In response to the national agricultural transformation policy from agriculture to agribusiness, tertiary agricultural programme must address the curriculum to meet the new imperatives. The current study reveals that there is a gap between what the curriculum provides and the futuristic realities of the sector. The role of agricultural extension is also important given the pluralistic and participatory approaches to the discipline. Farmers are no longer depending on extension officers but are becoming more dependent on each other through information sharing. There is a need to strengthen this aspect of the programme at ECIAF. ECIAF which provides technical skills in primary production agriculture should include in their curriculum technical skill sets in agricultural commodity utilization as means to adding economic value to agricultural produce whilst simultaneously creating the potential for agri-entrepreneurism.

References

Chen, X.A. 2000. "A few thoughts on the reform and development of agricultural schools." *The journal of Agricultural Vocational Education.* (Chinese version). **36**(2), 4-6.

Coorts, G.D. 1987. "Updating today's college curriculum for tomorrow's agriculture." *NACTA Journal* **31**(2), 20-21.

Egun, A.C. 2009. "Educational Futurism: A Case for the teaching of agricultural education to youths in Nigeria." *International Journal of Educational Sciences* **1**(1); 53-60

Food and Agricultural Organization of the United Nations. 1997. *Issues and opportunities for agricultural education and training in the 1990s and beyond.* Rome: Food and Agricultural Organization of the United Nations.

Graham, D.L. 2001. "Employer perception of the preparation of agricultural and extension education graduates." *Journal of Southern Agricultural Education Research.* 51(1), 88-101.

Hermsen, A. 2000. "Participatory curriculum development in practice: An experience at the Eastern Caribbean Institute for Agriculture and Forestry in Trinidad and Tobago." Accessed on FAO SD dimensions website (January 2011). http://www.fao.org/sd/EXdirect/EXre0030.htm.

Kunkel, H.O., I.L. Maw, and C.L. Skaggs. 1996. *Revolutionizing higher education in agriculture.* Ames, Iowa: Robson & Associates.

Muir-Leresche K, S. Scull-Carvalho. 2006. Improving approaches for effective teaching and learning: tertiary agricultural education. Nairobi: World Agroforestry Centre, p. 64.

Maguire, C. and D. Atchoarena. 2003. "Higher education and rural development: A new perspective." In *Education for rural development: Towards new policy responses e*dited by Atchoarena, David and Lavinia Gasperini. 311-384. Rome: FAO and UNESCO-IIEP.

Mohamed, Z., G. Rezai and N. Shamsudin. 2011. "The Effectiveness of Entrepreneurship Extension Education among the FOA Members in Malaysia." *Current Research Journal of Social Sciences* ***3****(1): 17-21.*

Maguire J.C. 2000. "Agricultural Education in Africa: Managing Change. A paper prepared for workshop 2000 Sponsored by the Sasakawa Africa Association Accra and Cape Coast Ghana." Available at http://siteresources.worldbank.org/INTARD/825826-1111044795683/20424536/Ag_ed_Africa.pdf

Ministry of Agriculture Land and Marine Resources. 2008. Tranformation plan from agri-culture to agri-business: *"Revitalizing the agricultural sector for Sustainability."Strategies for increasing agricultural production for food and nutrition security and competitiveness in Trinidad and Tobago.* Port-of- Spain: Ministry of Agriculture Land and Marine Resources.

Perez-Dlamini, M., S.T. Mbingo, and B.M. Dlamini. 2003. "Innovations needed in the Swaziland secondary schools agricultural curriculum." *Journal of International Agricultural and Extension Education* **10**(3) 37-45

Peura, J., P. Siiskonen, and K. M. Vesala. 2002, "Entrepreneurial identity among the rural small business owner-managers in Finland." In *Rurality, Rural Policy and Politics in a Nordic-Scottish Perspective* edited by HW Tanvig. Esbjerg: Danish Center For Rural Research and Development. Working Paper 1/2002.

Shao, X. and T.H. Bruening. 2002. "Changing the curriculum and teaching methods in Chinese Agricultural Schools." *Journal of International Agricultural and Extension Education* **9**(3): 69-76

Scanlon, D.C., T.H. Bruening, and A. Cordero. 1996. "An industry perspective on changes needed in agricultural education curricula." *Journal of Agricultural Education.* **37**(2):17-23

Slocombe, J.W. and E.E. Baugher. 1988. Revitalizing agricultural curricula. *NACTA Journal* **32** (3): 8-10.

Taylor, P. 1999. "Participatory curriculum development for agricultural education and training: experiences from Viet Nam and South Africa." In *Training for agricultural and rural development 1997-98, e*dited by Loy Van Crowder. Rome: FAO. Accessed from http://www.fao.org/docrep/W9699E/w9699e00.htm

Taylor, P. 2000. "New perspective, new curricula: A case study of participatory curriculum development in forestry in Vietnam." Paper prepared for the Forestry Education workshop, Vietnam, April 2000.

Williams, D. and A. Dollisso, 1998. "Rationale for research on including sustainable agriculture in the high school agricultural education curriculum." *Journal of Agricultural Education* **39**(3), 51-56.

http://www.unesco.org/iiep/eng/networks/iwge/2006/I_5a.pdf

Table 1: Ranked ordering for perceived level of preparation in selected thematic areas in ECIAF agricultural curriculum.

Areas	Perceived Level of Preparation				Mean (SD)
	Very Good% Score =4	Good % Score =3	Fair % Score =2	Poor % Score =1	
Livestock	65	34	1	0	3.64(0.50)
Crops	53	46	1	0	3.52(0.52)
Soil	43	53	4	0	3.39(0.57)
Farm Management	10	74	15	1	2.93(0.54)
Extension	14	56	29	1	2.83(0.67)
Sustainable Agriculture	8	60	28	4	2.72(0.67)
Small Machinery	3	66	28	3	2.69(0.58)
Food Safety	2	21	58	19	2.06(0.69)
Value Added	0	9	45	46	1.63(0.65)

Table 2: Rank ordering of importance of specific thematic areas for present job requirements.

Areas	Requirements for present Job functions (A) Mean (SD)	Rank order
Extension	3.61 ***(0.92)***	1
Crop	3.32 ***(0.74)***	2
Soil	2.98***(0.89)***	3
Sustainability	2.81***(0.69)***	4
Food safety	2.71 ***(1.11)***	5
Farm management	2.70 ***(0.89)***	6
Livestock	2.50 ***(1.01)***	7
Machinery	2.28***(0.69)***	8
Value Added	2.25 ***(1.06)***	9

Table 3: Shows the levels of competencies upon job entry and at present for selected areas of job functions.

Areas	Level of competence on job entry (B)	Level of competence at present (C)	t-test Between B and C
	Mean (SD)	Mean (SD)	
Livestock	3.67 ***(0.51)***	3.67 ***(0.54)***	0.21 (0.831)
Crop	3.48***(0.58)***	3.70 ***(0.50)***	9.80 (0.000**)**
Soil	3.39 ***(0.53)***	3.42 ***(0.58)***	0.28 (0.531)
Extension	2.78 ***(0.69)***	3.04 ***(0.64)***	9.38 (0.000)
Machinery	2.47 ***(0.71)***	2.68 ***(0.71)***	4.02 (0.000)
Sustainability	2.43 ***(0.67)***	2.79 ***(0.74)***	8.53 (0.000)
Farm management	2.14 *(0.67)*	2.71 ***(0.72)***	12.73 (0.000)
Food safety	2.13 ***(1.02)***	2.61 ***(1.00)***	9.58 (0.000)
Value Added	2.08***(1.01)***	2.28 ***(1.02)***	4.16 (0.000)

Table 4: Shows the degree of satisfaction with selected job satisfaction parameters for respondents (n=100)

Items	Very Satisfied (%)	Satisfied (%)	Somewhat Satisfied (%)	Dis-Satisfied (%)	Means	SD
Nature of job • Degree of independence.	42	57	1	0	3.41	0.514
• Relationship with other colleagues.	9	88	2	1	3.05	0.386
• Diverse nature of the job.	25	59	11	5	3.04	0.751
• Physical work environment.	14	76	10	0	3.04	0.491
• Relationship with supervisors.	18	68	10	4	3.0	0.667
• Flexibility in scheduling work.	11	78	10	1	2.99	0.502
• Remuneration for the job	13	58	28	1	2.83	0.652
• Recognition received from the job.	5	58	27	10	2.58	0.741
• Opportunity for skill development through training.	3	50	33	14	2.42	0.768
• Opportunity for promotion.	6	11	52	31	1.92	0.813
Overall Mean	***14.6 %***	***60.3%***	***18.4%***	***6.7%***	***2.82***	***0.628***