Information literacy: A Proposed Conceptual Framework for Agribusiness Education Reform in the Caribbean

Ingrid Iton
Main Library, The University of the West Indies, Cave Hill
P.O. Box 1334, Bridgetown, Barbados
e-mail: douglasiton@yahoo.com

Ardon Iton
Caribbean Agricultural Research and Development Institute, (CARDI)
The University of the West Indies, St. Augustine, Trinidad
e-mail: aiton@cardi.org

Abstract

The global information intensive economy has brought many changes and challenges to all nations. In this new economy the availability of information is growing at an exponential rate and the technologies which are used to store and access this information continue to change rapidly. In small developing nation states such as those in the Caribbean, the combination of these two factors constitutes a serious threat to the region's ability to compete effectively in the global marketplace simply because the region does not generally have a workforce which is skilled in the efficient use of information. Knowledge of, and the ability to use computer technology is not an adequate response to this challenge posed by the information society. What is required is a cadre of information consumers who have the ability to know when and how to effectively use the new technologies as well as when and how to use the resources to which these new technologies provide access. And, in this context one of the goals of institutions of higher education in the region must be to graduate these information consumers.

To achieve this requires curriculum reform that is supported by an educational philosophy that is informed by the recognition of the critical role of information literacy skills for the knowledge economy. To support the authors' contention that the teaching of these skills is critical for agribusiness development, the paper will present the results of a survey of the members of the Faculty of Agriculture at The University of the West Indies. The survey seeks to ascertain faculty perceptions of the importance of information literacy competencies for graduates in the faculty as well as their perception of the information research skills of the students they teach. Through the examination of these two variables the authors will propose a conceptual framework to transform the curriculum into one that will produce graduates who are information literate and functional as lifelong learners. In proposing this framework the authors will also establish the significant role information professionals have to play as partners working with academics and administrators to reform the curricula of agricultural education in the region.

Keywords: Information literacy, Curriculum reform, Agribusiness, Caribbean, Tertiary education. Information research skills

Introduction

The knowledge economy has privileged the critical importance of human capital to business enterprises as they seek to attain/maintain competitive advantage in the global marketplace. Information is the engine which drives this new economy and the ability of individuals in the organization to use the technology to access this information is generally viewed as one of the benchmarks which determine the success of the business in the market place. However, the ability to function effectively in the information society is not only about the possession of technical skills. There must be a blend of the technical with the cognitive in order for an individual to navigate and negotiate the information demands of the workplace and society. To this end, higher education institutions in the Caribbean must examine their programmes and revise their curricula to ensure that they are effectively preparing graduates to live and work in the information society.

The University of the West Indies (UWI), the principal tertiary institution serving the Caribbean, has articulated as part of its mandate, "to prepare a distinctive university graduate for the 21 century …." In doing so it has identified information literacy as a critical attribute for all of its graduates (UWI Strategic Plan 2007-2012). The technology is available and accessible but what is required for the Caribbean agribusiness/agriculture sector is a cadre of information literate consumers to leverage the technology and promote information sharing and to engage in meaningful collaboration. How well regional institutions of higher learning are preparing graduates to participate in this information-driven environment appears to be an under-studied area. The current study represents the first step in the process of addressing this deficiency. Exploratory in nature, the study investigates the perceptions of Agricultural Faculty at the UWI of the importance of information literacy skills to the educational development of students, a critical prerequisite to articulating why the teaching of these skills must form an integral part of curriculum reform.

Higher Education and the Information Society

The new information and communication technologies, in particular the Internet, have been the source of many challenges for the academy in relation to how students approach their learning, and by extension research, to support their learning. Today's students, most of whom are digital natives, have grown up with the Web and their comfort level with the tool, coupled with the access it provides to vast quantities of information, has largely influenced the way they think about the Internet and its apparent relevance/significance to almost every aspect of their lives. For most of these students, the traditional library was never a part of their formative educational experience and consequently they lack the basic knowledge about information resources from the print era, knowledge which is foundational in helping them to understand how to engage effectively with the resources made available through the various technological tools. Faculty need to be aware that this is the reality of most of the students they will encounter in their lecture rooms and accept that it is this ease of access and time spent on task that are students' intrinsic motivators. For these students, doing good research is not about engaging with the scholarly literature in the field, assessing the quality of the information they have chosen to use, understanding the significance of the proper use of information they have downloaded, understanding the significance of the journal literature to their research, or understanding that all information relevant to their needs may not exist in an electronic format.

As the Internet has become a more pervasive aspect of the information society, there has been a growing realization that fluency with the technology, while necessary, is not the only requirement to function effectively in the workplace. Librarians have understood from the beginning that computer literacy was only a subset of the skills required to navigate the information society and over time, the business sector has also embraced the critical importance of these skills. In his address to the graduating class of 1999 at the University of Toronto, Anthony Comper, President of the Bank of Montreal, advised: "Whatever else you bring to the 21st century workplace, however great your technical skills and however attractive your attitude and however deep your commitment to excellence, the bottom line is that to be successful, you need to acquire a high level of information literacy" (quoted in Breivik and Gee 2006). Comper's sentiments have been echoed by many in the library, education and business literature and his advice serves as a reminder to administrators, faculty and librarians in higher education of the need to ensure that one of the mandates of the 21st century academy must be the development of students who are prepared to be discerning consumers of information (McFarlane et al 2009, Breivik and Gee 2006)

Developing discerning information consumers underscores the challenge which confronts higher education globally. The increase in the volume of information available and the relative 'shelf life' of that information have expanded the notion of what it means to be literate in the 21st century beyond the traditional ability to read and write to include one's ability to locate and use information effectively and efficiently for both professional and personal activities. Information literacy skills instruction has been adopted by many higher education institutions as the response to this demand created by the information society. But, what is information literacy? The American Library Association (ALA) defines information literacy as the set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate and use effectively the needed information" (ALA 2000). Johnston and Webber (2003) contend that the definition "distinguishes it from description of 'information searching' or 'information finding', which foreground the information location element of information literacy," and which "…. is made not by mapping a subject area, but via a description of personal skills." The implication here is that within the context of an individual attaining these skills, time will be critical for their development and some form of assessment will be required to evaluate progress.

The performance indicators which accompany the ALA standards provide the framework which the academy can use to integrate the teaching of these skills into the curriculum. In addition to these standards, set for higher education in general, ALA has articulated a definition and a set of standards more closely related to the fields of science, engineering and technology. Information literacy in the sciences has been defined as "a set of abilities to identify the need for information, procure the information, evaluate the information and subsequently revise the strategy for obtaining information, to use the information and to use it in an ethical and legal manner and to engage in lifelong learning" (ALA 2006). The competency standards articulated are:

- The information literate student determines the nature and extent of the information needed.
- The information literate student acquires needed information effectively and efficiently.

- The information literate student critically evaluates the procured information and its sources, and as a result, decides whether or not to modify the initial query and/or seek additional sources and whether to develop a new research process.
- The information literate student understands the economic, ethical, legal, and social issues surrounding the use of information and its technologies and either as an individual or as a member of a group, uses information effectively, ethically, and legally to accomplish a specific purpose
- The information literate student understands that information literacy is an ongoing process and an important component of lifelong learning and recognizes the need to keep current regarding new developments in his or her field. (ALA 2006)

While these standards are intended to help guide information literacy instruction and assess students' progress throughout their tenure in the academy, they also serve to illustrate that the teaching of these skills requires collaborative partnerships between faculty and librarians. The teaching of information literacy skills is therefore a learning issue and not a library issue, and it requires the input of disciplinary content experts (faculty), and the information practitioners (librarians), working collaboratively not only to teach, but also in curriculum reform which is needed to drive the process.

Information literacy an Agribusiness Development

Contemporary agribusiness companies operate in a complex dynamic environment which is constantly changing. The factors which are driving this change include:

- Technological advances, especially information technology;
- Recent food scares and consumers' concern about food safety;
- More health and environmentally conscious consumers;
- Globalization and increased international competition;
- Innovation resulting in shorter product life cycles.

In this environment, information becomes a critical resource which a company needs to be able to manage in order to operate and to sustain its competitive advantage. In response, many companies have invested significantly in information and communication technologies in the belief that the technology will enable them to facilitate the leveraging of information to achieve a competitive advantage. Underlying this perception is the notion that once there is the connectivity to provide access, these companies will realize a return on their investments. But, investments in technology will yield negative returns if not accompanied by a corresponding investment in human capital since the volume and variable quality of the information to which the technology provides access require an individual with the skills to absorb, analyze, integrate, create and effectively use information in order to add value to the organization.

The key stakeholders in the agribusiness value chain are farmers, consumers, intermediaries and key supporting organizations each having information needs depending on where they are in the chain. Thysen (2000) posits that with the use of technology in the sector one of the impacts will be the obsolescence of intermediaries. He singles out Extension Officers, arguing that their only function is to collect information from various sources which is then repackaged to meet the specific needs of the farmer and, he queries whether this cannot be

achieved more cheaply and more rapidly with the utilization of technology. Fawcett et al (2007) expand on the significance of the technology when they privilege the importance of information sharing to the value chain. They contend that technology is the critical tool for enhancing information sharing, claiming that it is the ability of the professional to "identify changes in the competitive environment" through access to the information leveraged by the technology which will redound to the success of the supply chain response. But, within the context of the organizational information system access is not the only determinant for supply chain effectiveness, the more critical component is the quality of the data and information to which that system provides access. And, that quality is directly related to the skills of analysis, synthesis and communication possessed by the professional.

The agribusiness professional is therefore both a user and a creator of knowledge as author, inventor, researcher, marketer, manager, member of faculty and extension officer in the information knowledge chain. In addition, these professionals are also involved in the packaging and distribution of agricultural information. In the Caribbean context, much of this knowledge creation will need to be reflective of national and regional realities. It is knowledge that not only has to drive economic development, but that also has the potential to create a body of literature which has relevance for present and future researchers, practitioners and students of the region. Conceptually therefore, the essential inputs required for a market oriented agribusiness sector are a cadre of information literate individuals and the technology to support their needs (Figure 1). Together these are the essential elements for the successful development of viable agribusiness value chains which will result in a sector that is more responsive to end user demands. The primary focus of this research is on the information literacy input of the framework. In this regard, given the competitive nature of the contemporary agribusiness environment, organizations need to be market-driven or market driving. In order to do this, professionals in the organization must be able to contribute effectively to the sector, having acquired the skills that enable them to locate, evaluate and effectively use information to make timely informed business decisions.

Methodology

In the international literature there have been many studies conducted on the topic of faculty involvement with library instruction. Some have examined the factors which influence faculty attitudes to library instruction (Leckie and Fullerton 1999, McGuiness 2006) while others have looked at faculty attitudes to specific information literacy skills (Weetman 2005, Gullikson 2006). In contrast, this is an understudied area in the regional library and information science literature. However, research in the area is critical for informing and supporting curriculum reform. The research design used for the study was descriptive in nature and the target population was a random sample of the lecturers of the Faculty of Agriculture of the St. Augustine campus of the UWI. A total of 26 questionnaires were distributed in March 2011, and the data collected was analyzed using SPSS.

The questions attempted to capture information on the length of years the lecturers were on staff, their perception of the information capabilities of the students they taught, and the use of librarians to facilitate the information literacy learning process. Questions regarding the following used 5 point Likert Scales to gather the information:

- How critical are online library resources in supporting research in the lecturers' field?

Where 1 = no use, 2 = of little use, 3 = somewhat useful, 4 = useful, 5= very useful;

- How the lecturers rated the information research skills of their students?
  Where 1 = poor, 2 = weak, 3 = satisfactory, 4 = good, 5 = excellent;
- To what extent the lecturers thought it important for the students to graduate from the University with the following research skills:

(a) Capable of defining a research topic effectively;
(b) Able to effectively identify information appropriate to given research topic;
(c) Understand how information is communicated;
(d) Able to identify appropriate search tools to find needed information;
(e) Capable of formulating effective search strategies when looking for needed information within online research tools;
(f) Able to effectively synthesize information gathered from different sources;
(g) Understand issues related to academic integrity.
  Where 1 = not important, 2 = fairly important, 3 = do not know, 4 = important, 5 = extremely important.

Results and Discussion

A total of 21 questionnaires were returned, which represents approximately an 81% response rate. This response rate can be considered very high for "drop off" surveys. Fifty seven percent (57%) of the respondents were males and 43% females. There were no professors in the faculty, 14% were senior lecturers and 71% were lecturers. The remainder of the sample was assistant and part lecturers, with only 24% of the faculty having more than 15 years on staff. Generally, the faculty can be considered to be new with the largest percentage (38%) having fewer than 3 years on staff.

The study investigated how critical online library resources were in supporting research in the lecturers' field by use of a 5 point Likert Scale. Table 1 shows the results, with 66.7% of the respondents ranking these resources as very useful. The mean and standard deviation of the ranking were 4.47 and 0.87, an indication that the lecturers considered online library resources to be important to their own research. With regard to the lecturers' perception of the students' use of the resources of the Main Library, now the Alma Jordan Library, in preparing coursework, 86% were of the opinion that students did not make sufficient use of the library for this activity (Table 2).

Lecturers were also asked to rank the research skills of the students they teach. However, since many of the lecturers did not teach students at all levels, i.e. 1st year, 2nd year, 3rd year undergraduates and graduate students, the responses are less than the sample size. Tables 3, 4, 5 and 6 illustrate the results of this question. Based on the answers, no student category obtained an excellent ranking from their lecturers for their information research skills. Undergraduates received a predominant ranking of weak while the rankings for graduates were varied. The predominant ranking for graduates was satisfactory (38.5%) while weak and good were ranked equally at 30.8%. The lecturers were unanimous in their support of the view that the students needed training in information research skills. They all responded in the positive to the following question: Do you think students in your discipline can benefit from receiving instruction designed to enhance their information research skills? With regard to collaboration with librarians approximately 86% of the sample indicated that they had never worked with a librarian to design an assignment with a research component. Further, 43% do not teach information research skills as any part of their courses.

The final question on the survey instrument attempted to capture the faculty's perceptions of the importance of some of the information literacy skills as desirable graduate attributes. Tables 8 – 14 illustrate the various components of this question. "Extremely important" was selected by the highest percentage of respondents of the sample and zero percent of the respondents perceived any of the skills as 'not important." Table 15 provides a summary of Tables 8 – 14, by illustrating the means and standard deviations. All of the items received a mean score of above 4.00, an indication that from the lecturers' perspective these skills are extremely important for students to be deemed information literate. The small standard deviations suggest that the responses were tightly packed around the means.

Similar to the findings of other studies on faculty perceptions (McGuiness 2006, Weetman 2005, Leckie and Fullerton 1999) the St. Augustine faculty overwhelmingly considered information literacy competency skills to be very important graduate attributes. However, despite ranking their students' proficiency with the skills as generally weak and unanimously supporting the need for instruction, the results of the survey show that not much is presently being done to address the problem. Forty three percent (43%) of the faculty did not teach these skills in any part of their courses and eighty six percent (86%) had never worked with a librarian to design a research component for a course. The current scenario is therefore one in which there is a disconnect between their expressed beliefs and the actions required to fulfill the mandate articulated in the UWI's strategic plan. Given that the members of faculty have demonstrated an appreciation of the competencies that need to be developed and given that they are generally not satisfied with their students' research capabilities: what needs to be done to address the situation?

Integrating information literacy skills instruction into the agricultural curriculum is the platform on which the mandate expressed by the University and the needs articulated by the faculty can be realized. The integration of these skills within the disciplinary curriculum will provide "context, meaning and relevance for learners" (Smith 2003). And, it will facilitate the teaching of generic information skills in combination with the higher order discipline specific skills. In order to integrate teaching of the skills in a meaningful way, faculty will have to identify and document the critical competencies students of agriculture will need to master at each level (undergraduate to postgraduate) and the critical points where this instruction needs to take place. Curriculum reform must therefore drive this process. As members of faculty revise their courses to reflect this new emphasis, the articulation of core subject learning outcomes will have to also include information literacy outcomes. Similarly, assessment will have to include information literacy outcomes. However, based on the 86% negative response to working with a librarian, it is clear that many of the faculty within the UWI are unaware that it is "the synergy that comes out of teaching faculty and librarians working collaboratively that afford[s] students the greatest opportunities to develop information literacy skills within the context of a specific discipline" (Mackay & Jacobson 2005).

The UWI faculty is not unique in this regard. Many of the earlier studies in the literature lamented the fact that while both cohorts understand the critical importance of these skills to lifelong learning, the lack of communication between the two groups results in confusion as to who is responsible for teaching the skills (Leckie and Fullerton 1999, Ivey 1994, Major 1993). Internationally, as information

literacy became more pervasive in the academy, many of those barriers to communication have disappeared. However, the Caribbean information literacy landscape is still very much in its infancy and, in the absence of the teaching of these skills there is an opportunity to begin to cultivate collaborative relationships for curriculum reform. Curriculum reform which is driven by harnessing the knowledge and expertise of both faculty and librarians will not only ensure that revised syllabi satisfy internal quality assurance standards, it will also support the UWI's thrust towards institutional accreditation.

Conclusions and Recommendations

Kesselman and Sherman (2009) posit that "leaders who have learned to make connections between research, technology and tools of multiple disciplines for creative and informed decision making are needed. The first steps must be taken in the classroom …" An understanding of the critical role of information literacy in helping to prepare graduates for the 21st century market-oriented agribusiness sector is therefore vital if this sector is to contribute positively to the economic development of the region. The unpredictability of today's economic environment requires the University to restructure its curricular offerings, cognizant of the need to create learning experiences which are based in 'real world' realities. In the context of the limited 'shelf life' of information, such an approach privileges the importance of knowledge creation/generation to adding value to an organization. And, this establishes the need for the University to produce graduates who understand the importance of becoming self-directed independent learners with an appreciation for the wide variety of information resources available within their disciplinary areas coupled with an appreciation of the skills for locating and evaluating that information.

This study, though exploratory, provides some concrete data beyond anecdotal observations which will be valuable in articulating an action plan to initiate and move the process forward. The first step in this process would be for the faculty in the various departments to identify what are the basic agriculture/agribusiness information literacy skills they wish their students to have mastered by graduation. The articulation of these information literacy competencies must not only speak to tangible skills but also to knowledge about, as well as the values which are intrinsic to, the skills. At the same time, the skills identified must have relevance to the kind of real world activities that the student is likely to encounter as a professional, bearing in mind that the ability to be an independent learner must also be the ultimate objective. The identification of these skills will provide the framework for the collaborative discussions between faculty and librarians by enabling librarians to have a better understanding of the discipline and the skills required. This facilitates the librarian's ability to articulate approaches to the teaching of the skills which are compatible with the outputs of the curriculum, and the discourse between librarians and faculty will help the faculty to understand the value that librarians bring to the process. Beyond the identification of information literacy skills, the agriculture faculty will need to work with librarians to identify the core courses where these skills will be taught; which skills will be taught within each discipline; and, what is the best method/tool for assessment. The process requires a change to the existing culture of which the dominant feature has been the lack of communication. This will be challenging but in order to operationalize the UWI's strategic plan all stakeholders will have to reassess and reengineer their approaches so that they can ensure that

the UWI is able to "prepare a distinctive graduate for the 21st century." (UWI Strategic Plan 2007-2012).

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Table 1: Ranking of how critical online library resources are to lecturers (N=21)

Rank of usefulness	Percent of sample
No use	0
Of little use	4.8
Somewhat useful	9.5
Useful	19.0
Very useful	66.7

1 = no use, 2 = of little use, 3 = somewhat useful, 4 = useful, 5= very useful

Table 2: Lecturers' perception of students' use of main library resources in preparing coursework (N=21)

Response	Percent of sample
Yes	0
No	85.7
Do not know	14.3

Table 3:Lecturers ranking of 1st year students' information research skills (N=11)

Rank	Percent of responses
Poor	18.2
Weak	81.8
Satisfactory	0
Good	0
Excellent	0

1 = poor, 2 = weak, 3 = satisfactory, 4 = good, 5= excellent

Table 4:Lecturers ranking of 2nd year students' information research skills (N=14)

Rank	Percent of responses
Poor	7.1
Weak	71.4
Satisfactory	21.4
Good	0
Excellent	0

1 = poor, 2 = weak, 3 = satisfactory, 4 = good, 5= excellent

Table 5: Lecturers ranking of 3rd year students' information research skills (N=18)

Rank	Percent of responses
Poor	0
Weak	61.1
Satisfactory	38.9
Good	0
Excellent	0

1 = poor, 2 = weak, 3 = satisfactory, 4 = good, 5= excellent

Table 6:Lecturers ranking of graduate students' information research skills (N=13)

Rank	Percent of responses
Poor	0
Weak	30.8
Satisfactory	38.5
Good	30.8
Excellent	0

1 = poor, 2 = weak, 3 = satisfactory, 4 = good, 5= excellent

Table 7:Percentage of sample that worked librarian to design an assignment with a research component (N=21)

Response	Percent of sample
Yes	14.3
No	85.7

Table 8: Lecturers ranking of students' information literacy capability of defining a research topic effectively (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	4.8
Don't know	0
Important	14.3
Extremely important	81.0

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 9: Lecturers ranking of the importance of the capability to effectively identify information appropriate to a given research topic (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	0
Don't know	0
Important	19.0
Extremely important	81.0

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 10: Lecturers ranking of the importance of the capability to understand how information is communicated in their discipline (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	0
Don't know	4.8
Important	33.3
Extremely important	61.9

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 11: Lecturers ranking of the importance of the capability to identify appropriate research tools to find needed information (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	0
Don't know	0
Important	38.1
Extremely important	61.9

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 12: Lecturers ranking of the importance of the capability to formulate effective search strategies when looking for needed information within online research tools (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	4.8
Don't know	4.8
Important	14.3
Extremely important	76.2

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 13: Lecturers ranking of the importance of the capability to effectively synthesize information gathered from different sources (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	0
Don't know	0
Important	4.8
Extremely important	95.2

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 14: Lecturers ranking of the importance of the capability to understand issues related to academic integrity (N=21)

Rank	Percent of Sample
Not important	0
Fairly important	0
Don't know	0
Important	14.3
Extremely important	85.7

1 = not important, 2 = fairly important, 3 = don't know, 4 = important, 5= extremely important

Table 15: Mean and standard deviation for tables 8 – 14

Questions	Mean	Std deviation
Capable of defining a research topic	4.67	0.91
Able to effectively identify information appropriate to a given research topic	4.81	0.41
Understand how information is communicated in the the primary discipline which they are studying	4.57	0.60
Able to identify appropriate search tools to find needed information	4.62	0.50
Capable of formulating effective search strategies when looking for needed information within online research tools	4.62	0.80
Able to effectively synthesize information gathered from different sources	4.95	0.22
Understand issues related to academic integrity	4.86	0.36

1= not important, 2= fairly important, 3= don't know, 4= important, 5= extremely important.

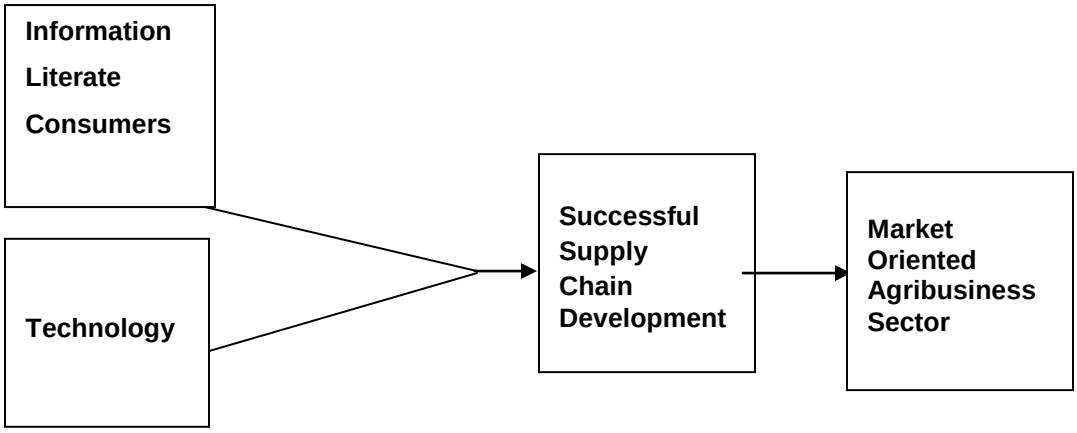

Figure 1: Conceptual Framework for a Market Oriented Agribusiness Sector