

Effects of students' Awareness of Bioentrepreneurship opportunities in Biology Education on Combating Economic Recession in Nigeria

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Abstract

There are many economic, social and environmental challenges in our local and global society. Overpopulation and the depletion of natural resources, food security, overexploitation of ecosystems for direct use and non-use utility are among the human-environmental issues that have created economic, social and ecological problems. To survive the global economic downturn, science (Biology) and technology breakthrough have been the means of advancing human life. This paper brings to lime light the level of students' awareness of areas where biology education could be relevant in setting up bioentrepreneurship that could respond to the pressing issue of the day tagged "Economic recession". The study took a survey approach and got its data from two-point questionnaire. Three research questions were adopted and simple frequencies, means and charts were used to analyze and answer the questions. It was discovered that most students were not aware of nine out the fourteen mentioned bioentrepreneurship areas. The respondents were all interested in bioentrepreneurship aspects of biology education. It was therefore recommended that bioentrepreneurship education be included in biology curriculum and the government should provide enough funds to make the intention be realised.

Key words: *Biology Education, Bioentrepreneurship and Economic recession*

Introduction

In Nigeria today there are many social, economic, and environmental challenges which resulted into unemployment and poverty and finally culminated to the present "economic recession" the country is facing. This propelled the federal government to initiate the training of youths in various entrepreneurial skills which is aimed at making individuals being gainfully self-employed. The impact of these training programs have not really been felt as to enable Nigeria become an economically giant nation (Oricha, 2008). Science and technology offer a lot in the socio – economic and cultural development of any nation. Its dynamism and the introduction of new technologies have influenced new discoveries and developments in biological knowledge. We live in a changing society in which new knowledge is constantly being discovered and old knowledge being proved wrong and or improved upon (Nicholls and Nicholls, 1980). Appropriate education is vital to ensuring that biology provides the knowledge base to support entrepreneurship. Biology has been identified as a discipline that has great potential to affect the welfare of mankind (Woese, 2004). This goes to say that achieving the millennium goal of being a giant economy will require among other things inculcating in the students of biology at all levels of education Bioentrepreneurship skills. This focus is currently lacking in Nigerian educational system leading to production of many graduates who are not either gainfully employed or self-employed. This is in line with Offorma's (2005) advice as she said that for Nigeria to become

a key player in the world economy of the 21st century, the education system should produce job creators and not job seekers.

Education is the process of conveying usable information to group of learners. It comprises of many activities and processes which are carried out at different levels directed at facilitating learning among learners (Tagoe, 2012). Quality education is one that satisfies basic learning needs and enriches the lives of learners and their overall experience of learning (UNESCO, 2011). To achieve quality education, relevant knowledge, skills and attitudes that are necessary for national development must be inculcated into individuals and these outcomes are linked to national goals.

Education is central to sustainable development as it empowers people and strengthens nations. It opens doors to all to lift them out of poverty; it promotes economic growth and national productivity. An educated science and technology skilled workforce is one of the pillars of any knowledge-based economy. It improves productivity which leads to higher income generation and improved economic performance of the country and can take the nation out of economic recession.

Economic recession

Economic recession is defined as economic 'go slow' which brings an economy to low ebb (Chaston, 2009). It can be explained as a difficult time for the economy of a country; a period when a country experiences less trade and industrial activities that often results in high unemployment rate, redundancy, business short-down or systemic distress of business ventures. Some of the consequences include hardship, poverty, frustrations and unbearable misery that usually push the business into financial slump, income downturn or collapse of investments, stagnated ventures, shattered career dreams and aspirations. Recession also puts immense financial pressures on family bread winners, financial pillars of organizations and even guardians. A characteristic of an economic recession or downturn is reduced consumer spending due to the combined influences of falling incomes, rising unemployment and a decline in confidence

Bioentrepreneurship

Entrepreneurship is concerned with setting up of business, managing it and effectively bearing risks to achieve the set goals (Okoli, 2010). Anyanwu (2010) sees entrepreneurship as the ability to be creative, utilizing opportunities available both for self-sustenance and contributing to the needs of others. Therefore, entrepreneurial skills are styles and abilities used in business set up to effectively manage it with the risks involved leading to achievement of a set goal (profit making). Most Nigerian youths like to seize opportunities they hardly want to start a business of their own they go into starting a business because no other option is available.

Bioentrepreneurship is the application of biological knowledge to serve human needs by setting up biology based business, managing it and effectively bearing risks to achieve the set goals. Human society has tapped biological knowledge for millennia to produce food, feed, beverages and fiber and the advent of modern technologies and new biological knowledge has vastly expanded the applications of biology. Biological sciences have advanced rapidly during the last decades. This has made one more conscious of the social, economic, and environmental challenges that man faces in an increasingly urbanized, but ecologically interconnected global environment. Biological knowledge can help to building a sustainable relationship between nature and human society. Entrepreneurship in biology entails inculcating in the learners any specialized areas where biology skills can enable them establish and manage any business enterprise (Oricha, 2008). Entrepreneurship is numerous in biological science knowledge, as few can be mentioned in the following fields of biology:

Genetics where crossbreeding of plants and animals produce hybrid of desired qualities that could be sold for monetary and nutritional value; Microbiology/ Parasitology where graduates can conveniently set up a diagnostic medical laboratory to carry out tests involving different disease microbes and setting up diagnostic laboratories for monetary gains; Environmental biology where graduates can set up horticulture business for aesthetic and nutritional values. They can develop proper methods of waste disposal systems or outlets as business ventures; Medicinal biology where graduates set up biotechnology laboratories to produce beneficial medical products such as different forms of vaccines, insulin, monoclonal antibodies, etc. This eventually boosts the individual and nation's economy; Food technology which involves the development of food production, food processing and food preservation industries that would reduce post-harvest waste of numerous plant and animal produce as well as reduce starvation and improve food security. This has potential to boost both the individual's and national economy. Other fields include animal husbandry, crop production, fishery (hydrobiology). They can setup biological science equipment improvisation companies production of teaching aids for effective teaching of biological sciences concepts, examples include construction of pooter, transect line, secchi disc, fish traps, insect nets, animal cages, models, charts, wind vanes, rain gauges etc. for sales to generate funds.

Having seen these various entrepreneurship fields in biology; the questions that needed to be answered are the entrepreneurial skills required by biology students and are students aware of possible bioentrepreneurship ventures?

Role of Biology Education

Biology education can help to bring about economic progress and sustainable development in a nation especially developing countries like Nigeria. The knowledge, skills, attitudes and values acquired through biology education can bring about the eradication of hunger and extreme poverty since it can enable many areas of job creation and improved food production. It can help ensure environmental sustainability and improved health. It can help ensure a safer, healthier environmentally sound world, while simultaneously contributing to social and economic progress and international cooperation.

Biology education prepares individuals for various vocations and carriers like medicine, agriculture, nursing, teaching etc. and it affords people opportunity for useful employment in various fields of human endeavour. Some of the areas of Biology-based careers include Microbiology, Parasitology, Biochemistry, Enzyme technology, medical services, Agriculture, biotechnology and genetic engineering (Aniama, 2014).

Biology education can help provide solution to a lot of social problems among which are environmental conservation and control, environmental pollution, disease control, human genetics, waste management and control, hygiene, health issues, population control and family life issues, vaccinations against infections of various diseases, exercise, alcohol, smoking and drug abuse, pest control, climate change etc. Biology education can help stimulate interest in biology based ventures, like growing of ornamental plants (horticulture), snail keeping, bee keeping, edible fungus farming etc. All these activities engender sustainable development and enhance individual and family income.

The skills, processes, attitudes and values learnt in biology like science process skills, scientific method, scientific attitudes and the morality behind the practice of science and technology enable the individuals tackle effectively personal, inter personal and societal problems. Scientific attitude for example, date to psychological trait like: curiosity, honesty, objectivity, respect for the opinion of others, respect for evidence, scepticism, open-mindedness, care for the welfare of others etc. Such attitudes when cultivated, contributes in no small measure to peace building, cooperation and unity in a country. These attributes

could lead to friendly and conducive environment that brings about happiness and peace for individual and the society at large.

Problem of the Study

Biology has been taught in Nigeria at the level of cognitive development leaving out the occupational aspect. This is because of the wrongly held view that most self-employed personnel are school drop outs and poor and that it is only well trained or educated persons who should be able to get a 'white collar' job. This has made unemployment and poverty to be on the increase. If emphasis is laid on exposing the biology students to bioentrepreneurship opportunities in this age of science and technological development, the globe will be better. Therefore, there is need to identify biological or biology related entrepreneurial skills needed to be acquired by biology students and the their level of awareness of bioentrepreneurship opportunities to enable them become gainfully self-employed on graduation. The study will also find out the extent to which students are interested in acquiring these entrepreneurial skills.

Purpose of the Study

The purpose of the study is to:

1. Determine the entrepreneurship areas in available to biology students in their various fields of specialization.
2. Find out the level of awareness of Bioentrepreneurship areas on opportunities among students.

Research Questions

The research questions formulated for this study are as follows:

1. What are the bioentrepreneurship skills available to biology students to aid ameliorate economic recession?
2. What is the level of awareness of biology students of bioentrepreneurship opportunities?
3. What is the extent of biology students' interest in acquiring of entrepreneurial skills for bioentrepreneurship ventures?

Methodology

The study adopted descriptive survey research design. Students in biology department of the Federal College of Education Okene in Kogi State constituted the subjects for the study. The choice was based on the fact that students from various states and local governments were represented. Also it is a teacher training institution where the students are prepared to go and teach younger ones with bright entrepreneurship and occupational future.

The study's population consists of all the students offering biology as a course in Federal College of Education Okene in the year 2017. The sample was made up of fifty (50) students selected by using a hat draw random sampling technique.

A two point scale questionnaire was designed to generate data that would help answer the research questions. The data generated were analyzed using simple frequencies, mean and charts to answer the questions; these data were organized according to the research questions. The questionnaire was validated by experts in biology education who have in depth knowledge of entrepreneurship through the checking of the appropriateness of the items.

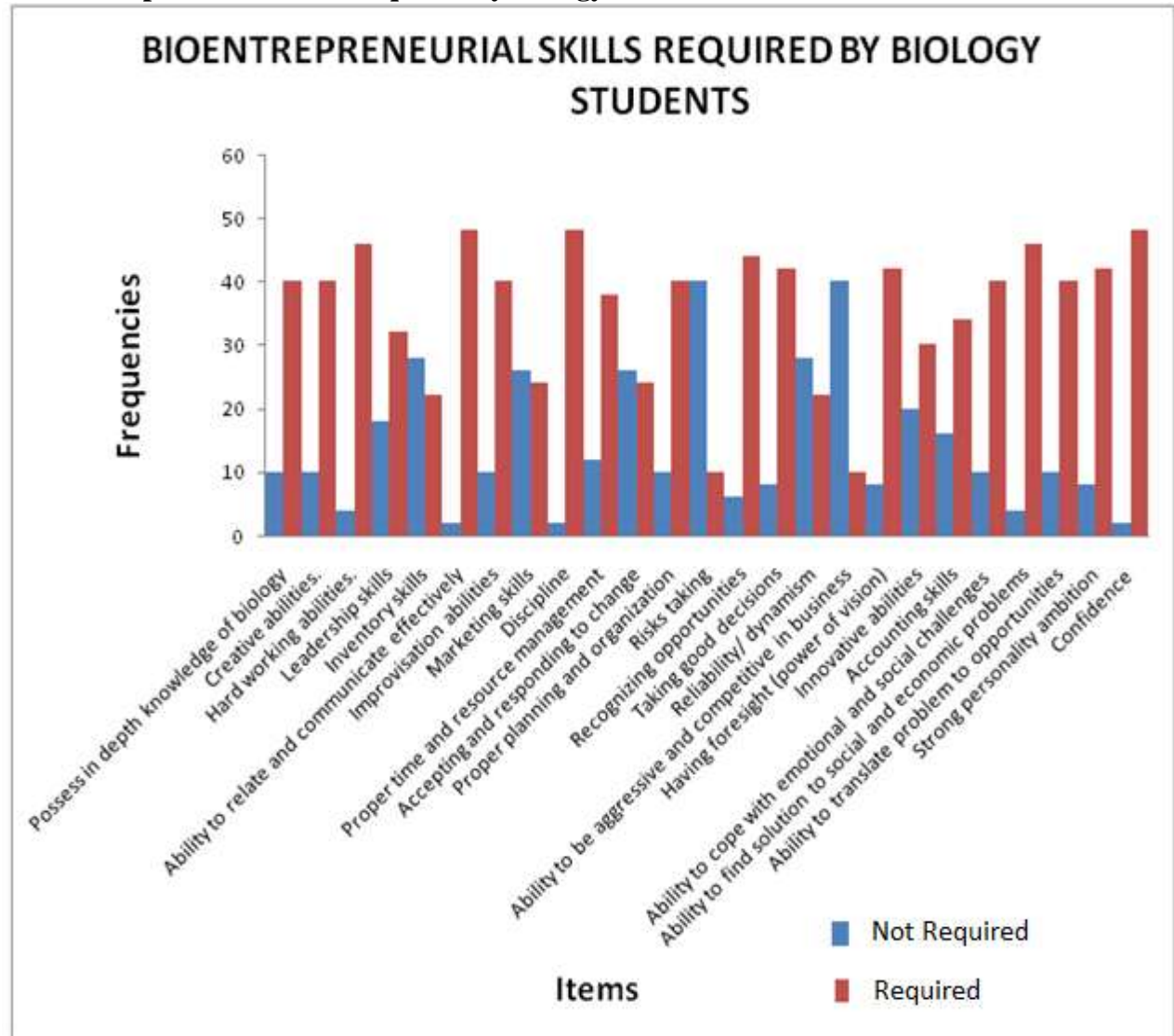
Results

Research question 1:

What are the bioentrepreneurs skills available to biology students to aid ameliorate economic recession?

To answer question 1 the data in table 1 were collated and analyzed using the simple frequencies, mean and charts. N = 50

1: Bioentrepreneurial skills required by biology students



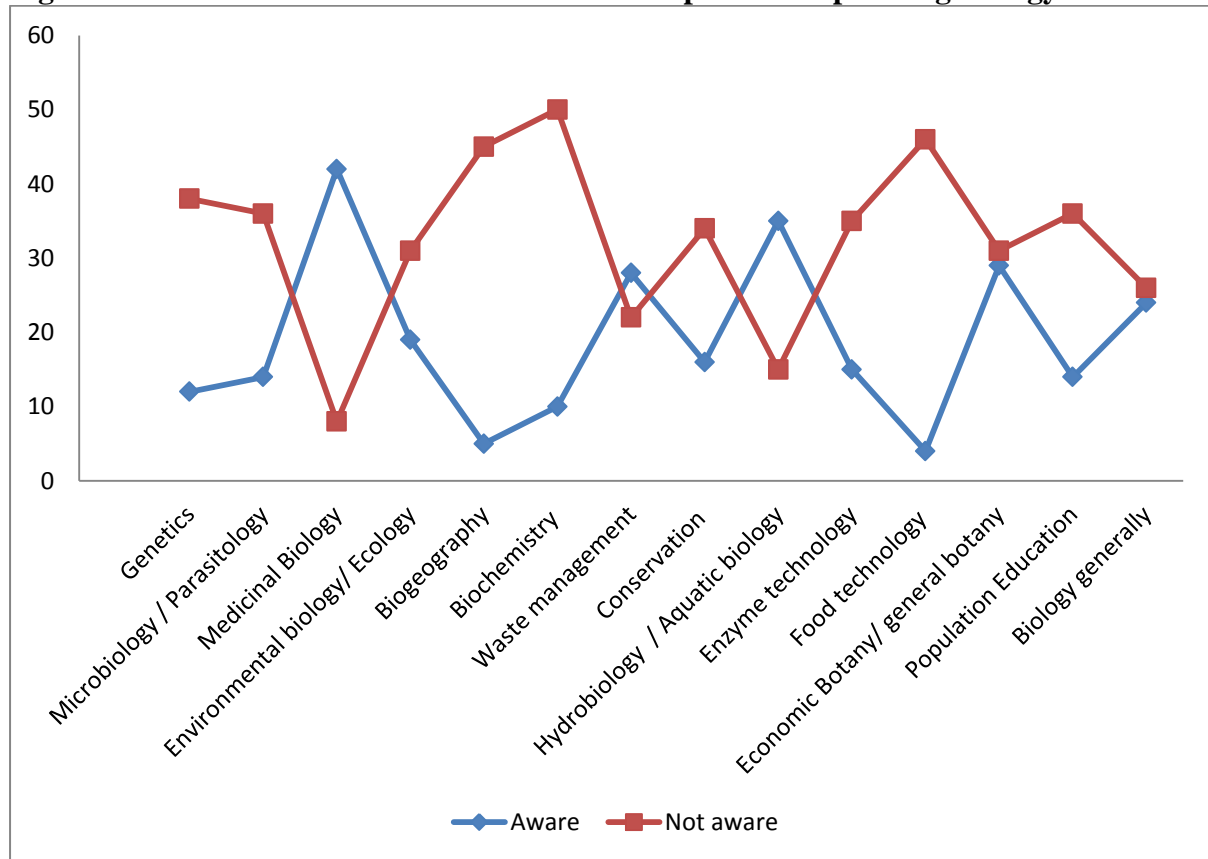
The responses given on the figure above shows that all the skills are required by biology students as they are mostly important. The exceptions are the inventory skills, marketing skills, accepting and responding to change, reliability/dynamism, risk taking and the ability to be aggressive and competitive in business skill which majority of the respondents says are not important. It is also worthy of note that confidence had very high response 90% of very important.

Research question 2

What is the level of awareness of biology students of bioentrepreneurship opportunities?

This question was answered by using simple frequencies and chart to analyze the data as shown below.

Fig 2: Awareness level of various area of bioentrepreneurship among biology students



The chart above indicates that the respondents do not have in-depth awareness of Bioentrepreneurship areas. They showed very low awareness level in both knowledge area and Bioentrepreneurship skills. Their awareness levels are far below expectation.

The respondents were not aware of the type of jobs that the listed areas could lead to. Since they are ignorant of these biological areas how can they think of their utilization? Offorma (2005) advises that for Nigeria to become a key player in the world economy of the 21st century, the education system should produce job creators and not job seekers. Therefore, there is the need for proper biology education that comprises a blend of good knowledge of the content areas and bioentrepreneurial opportunities so as to attain a knowledge economy in the field of biology. This will help to reduce poverty, boost the economy and combat economic recession.

Research question 3

What is the extent of biology students’ interest in acquiring of entrepreneurial skills for bioentrepreneurship ventures?

Table 1: Biology students' interest in acquisition of entrepreneurial skills

Yes	50
Percentage	100%
No	0
Percentage	0%
Total no	50
Total %	100%

Table 1 above shows that all the respondents are interested in acquiring entrepreneurial skills for bioentrepreneurship.

Discussion

The data presented in Figure 1 provided the answer to research question 1 which says, what are the bioentrepreneurship areas available to biology students to aid ameliorate economic recession?

The respondents all agreed that all the listed skills are required for entrepreneurship except for the inventory skills, marketing skills, accepting and responding to change, reliability/dynamism, risk taking and the ability to be aggressive and competitive in business. The students not being well disposed to taking inventory; marketing their products; accepting and responding to change; being reliable or dynamic; taking risk as well as being aggressive and competitive in the business is worrisome because these skills are crucial to success in business. Their acceptance of all other skills is in line with Offorma (2005) who advises that for Nigeria to become a key player in the world economy of the 21st century, the education system should produce job creators and not job seekers. To attain the desired goal of becoming a giant economy. Nigeria should pursue bioentrepreneurship education seriously. Therefore, the need to produce competent skilled manpower in biological sciences cannot be over emphasized as this will reduce poverty, create jobs and employment, improve food security and help reverse the present economic recession.

The response on table 1 answered research question 3 which wanted to find out the extent of biology students' interest in the acquisition of entrepreneurial skills for bioentrepreneurship ventures.

All the respondents showed high interest in acquiring bioentrepreneurial skills. This is a promising hope for the future as it implies that they all want to be self-employed as well as employers of labour. If this happens combating economic recession will be very easy. This was expressed by Anyanwu (2010) who sees entrepreneurship as the ability to be creative, utilizing opportunities available both for self-sustenance and contributing to the needs of others. It shows an improvement in the both the labor and business sector since it is very important to develop positive interest in whatever field of endeavour one wants to engage in.

Conclusion

The research shows a very impressive finding as there is indication of the future generation being bioentrepreneurship oriented. Entrepreneurial training according to Akintola (2001) is a programme or part of programmes that prepares individuals to undertake the formation and or operation of small business enterprise which also include franchise operation for the purpose of performing all business functions relating to a product or service with emphasis given to the social responsibilities, legal requirements and risks for the sake of profit involved in the conduct of a private enterprise. If these bioentrepreneurial skills are built into the curriculum and the concepts well inculcated into the students there is high hope

of many individuals becoming self- employed and recession will become a thing of the past in Nigeria.

Recommendations

The following recommendations are suggested:

- Biology is a powerful tool for economic, social and political development of Nigeria. There is need to build into the biology curriculum bioentrepreneurial skills necessary for bioentrepreneurship ventures. It is hoped that if these skills are built into the curriculum many job creators and not job seekers will emerge to improve on the economic growth of Nigeria.
- Government should provide adequate funding to different institutions to enable commitment and in-depth training of the students.
- Entrepreneurship education should be made compulsory for all students at all levels of educational system in Nigeria.

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