



Full Length Research Article

GENDER RESPONSE AND SENSITIZATION OF STUDENTS IN OYO STATE, NIGERIA ON CAREER CHOICE IN S&T (CASE STUDY: FOOD SCIENCE AND TECHNOLOGY)

¹Subuola B. Fasoyiro, ²Michael O. Oyelakin, ²John P. Alimi, ²Kafayat O. Zaka, ²Alice O. Ajani, ³Abosede O. Oduntan, ⁴Abiodun A. Olapade, ¹Elizabeth A. Farinde, ¹Sunday O. Osunbitan, ¹Elizabeth A. Ejigbo, ³Folashade O. Adeboyejo, ²Funmilayo F. Ilesanmi and ⁵Michael O. Afolabi

¹Institute of Agricultural Research and Training, Ibadan, Oyo State, Nigeria

²Nigerian Stored Product Research Institute, Ibadan, Oyo State, Nigeria

³National Horticultural Research Institute, Ibadan, Oyo State, Nigeria

⁴University of Ibadan, Ibadan, Oyo State, Nigeria

⁵Bowen University, Iwo, Osun State, Nigeria

ARTICLE INFO

Article History:

Received 29th November, 2014
Received in revised form
04th December, 2014
Accepted 24th January, 2015
Published online 27th February, 2015

Key words:

Career choices,
Entrepreneurship,
Food science and technology,
Gender,
Students

ABSTRACT

A -day sensitization workshop was organized on career choice in sciences and technology with case study in food science and technology for secondary school science students. The objectives of the workshop were to assess the knowledge of the students on science and technology, food science and technology as a career and entrepreneurship opportunities in food science and technology. Initially, a pre-test was conducted with a structured questionnaire to ask for their level of awareness on S&T, food science and technology and entrepreneurship. The sections involved three career talk presentations in the three areas of assessment and product exhibitions from three research institutes. Post test was conducted after the presentations and exhibitions to assess their current knowledge after the sensitization. Students assessed were in senior secondary school II and III classes. The male students were in the age range of 14 to 17 years while the female students were in the age range of 13 to 18 years. Result of the pre-test showed that 52.9% and 47.1% of the male and female students respectively were personally interested in science classes while others were influenced by either parents, teachers, siblings or role models. Students below average percentage; male (47.1%) and female (35.3%) had never heard of food science and technology as a discipline, only 5.9% of the male respondents which was 17.4% of the total respondents showed interest in choosing food science and technology as a discipline from the pre-test result.

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INTRODUCTION

Youth below the age of twenty four year forms 60% of the 167 million populace in the Nigeria (Alika, 2010). Youth unemployment is high and is a key challenge among graduates from tertiary institutions (Clark, 2013). Our higher institutions of learning graduate students yearly who enters the labour market seeking for white collar jobs. Youth unemployment hence contributes to the social menace in the society. It is important to look inward and begin to re-orient secondary school students before they gain admission into the higher institutions on disciplines with work prospects especially towards self-reliance.

Several factors have been studied that contributes to choice of career of students which include parental influence, peer influence, personal interest, ability, skills, personality, financial benefits and prestige of the job (Alika, 2010, Ezeani, 2013 Emerie, 2014, Okafor, 2012) guidance and counseling (Oye et al., 2012) and role of mentors or role models (Adeyemi et al., 2013). Lack of information and proper guidance has often been attributed to wrong choices. Proper education through sensitization creates awareness and interest which encouraged students in right choices of their career path (Oye et al., 2012). Science and technology (S&T) disciplines offer various opportunities to meet different societal needs through research for development. A country's ability to secure good health, prevent disease, conserve the environment, ensure food security, develop new industries and technologies,

***Corresponding author: Subuola B. Fasoyiro**

Institute of Agricultural Research and Training, Ibadan

sustain growth and compete in a global economy is dependent on the scientific knowledge and skills of its people (Ekiné and Abay, 2013). A research report shows that the number of female students enrolling in higher institutions in the fields of science and technology in Nigeria is increasing in comparison to gender disparity observed one decade ago. Motivation factor has been attributed to the positive change achieved in bridging the gap in career choices in S&T (Aderemi *et al.*, 2013). The essence of education or sensitization has been to eliminate ignorance (Oye *et al.*, 2012).

Food science and technology (FST) is one of the fields in S&T that creates room for diverse products development and for entrepreneurship. It is the application of science to the manufacturing, processing, product development, packaging, preservation, storage, distribution, utilization, and safety of food products (Potter and Hotchkiss, 1998, Atkinson *et al.*, 2001). While science aspect deals with the research, the technology aspect is about application of food science principles for industrial use. This discipline offers diverse low-cost food entrepreneurship opportunities that will help young graduates with support of start-up funds not only to be job creators but also employers of labour. Cottage or small scale industries that produce food products contribute to gross domestic products and economy of any nation and these can grow into larger industries contributing also to the labour market (Arkinson *et al.*, 2001). Hence, the objectives of this study were to assess level of awareness and understanding of secondary school students in the fields of S&T with focus on food science and technology and to sensitize and encourage them on the work prospects and possible entrepreneurship possibilities in the field for career choices in the future.

MATERIALS AND METHODS

Students in six (6) science classes in secondary schools (SSSII and SSSIII classes) from Ibadan, Oyo State were invited and used for the study on January 28, 2015 at Nigerian Stored Product Research Institute, Ibadan, and Oyo State. The study was conducted as part of a day sensitization workshop for the students organized by Nigerian Institute of Food Science and Technology (NIFST) Western Chapter-Oyo/Osun zone as part

of its zonal activity. The schools include one females only secondary school with six (6) students, one males only secondary school with (6) students while the other four secondary schools were mixed schools with male and female together with twenty two (22) students making a total of thirty four (34) students in attendance. The workshop was divided into four sections; pre-test, sensitization, food products exhibition and post-test. Pre-test and post-test were used in examining the student's level of awareness and understanding on the subject matters of the workshop.

Pre-test: Involves the use of structured questionnaire covering personal characteristics which include sex and age, other questions included whether parents are in science or technology disciplines, the person who influenced their choice of science classes or whether it was by personal interest, level of knowledge of the student in differentiating science from technology or whether both were the same. They were asked also to define these words in their understanding; science and technology. They were asked if they have heard of food science/ technology (FST) before, what they knew it was about, what they know about entrepreneurship (Table 1 show the format for the pre-test).

Sensitization: This section covers topics on career choices in science and technology, career choice in food science and technology and job/ entrepreneurship opportunities in food science and technology. This was to get the students to have better understanding of what science, how it is different from technology, various application of science and technology, subjects to be passed in gaining admission to higher institutions of learning in sciences and technology with special focus on food science and technology, work prospects of field of food science and technology and entrepreneurship opportunities for income generation/ cottage industries for self-reliance.

Exhibition: Food products from Product Development Programmes of three research institutes were presented to showcase products of technology to the students to be familiar with possible areas of developing themselves into future food

Table 1. Pre-test questions asked from respondents

Section A
Name
School
Age
Sex
Section B
Is your mummy in science/technology field? Yes or No
Is your daddy in science/technology field? Yes or No
Who influenced you to become a science student? A. father B. mother C. brother/sister D. teacher E. personal interest F. role model G. others
Section C
Is science is the same as technology? Yes or No
Define science
Define technology
Do you know your future career? Yes or No
If yes, what career choice?
Identify two pure science disciplines
Identify two applied science disciplines
Have you heard about food science and technology discipline? Yes or No
If yes, what is food science/technology about?
Have you heard of the word entrepreneurship? Yes or No
If yes, what is entrepreneurship about?

entrepreneurs and in generating income from food science and technology. The three research institutes were Nigerian Stored Products Research Institute, Ibadan (NSPRI), National Horticultural Research Institute, Ibadan (NIHORT) and Institute of Agricultural Research and Training, Ibadan (IAR&T). Products displayed were well-packaged products from cassava, legumes, fruit, spices and roselle calyces which included soy bread, soy ogi, soy gari, soy chin-chin, zobo drink, soy milk (IAR&T products), pineapple drink, carrot drink, tomato puree, powdered tumeric, (from NIHORT), tapioca, bread fruit chips, dehulled pigeon pea packaged seeds and fufu flour (NSPRI products).

Post-test: After the sensitization and exhibition sessions, the post-test was carried out to assess level of current awareness of the subject. Table 2 shows the format for the post-test.

Table 2. Post-test questions asked from respondents

Key questions
Is science the same as technology? Yes or No
Do you now have better understanding of food science/technology discipline? Yes or No
Do you now have better understanding of entrepreneurship? Yes or No
Mention food enterprises you are willing to practice for income generation

Statistical analysis: Data collected were analyzed by descriptive statistical methods; percentage and frequencies using Statistical Analytical Systems (1993).

RESULTS AND DISCUSSION

Pre-test

Age

Table 3 shows the percentage age of respondents by gender. The age of the female respondents was within 13 to 18, 41.2% was the dominant age group of the female respondents while the least was 13 years (11.8%). The male respondents were within age 14 to 17. The dominant age group was 15 years (29.4%).

Table 3. Percentage (%) and frequency (F) of age of respondents by gender

Gender	Number	Age (years)											
		13		14		15		16		17		18	
		%	F	%	F	%	F	%	F	%	F	%	F
Female	17	11.8	2	11.8	2	41.2	7	17.7	3	5.9	1	11.8	2
Male	17	-	-	17.7	3	29.4	6	23.3	4	23.3	4	-	-

Parental discipline/job area

The percentage (%) and frequency of parents of respondent in S&T disciplines are shown in Table 4.

Table 4. Percentage (%) and frequency (F) of parents of respondents in science/technology disciplines by gender

Parents	Female respondents		Male respondents	
	%	F	%	F
Mother	23.5	4	23.5	4
Father	29.4	6	35.3	6

The female respondents had 23.5% mothers in S&T fields and 29.4% for father. The male respondents had more fathers (35.3%) in S&T fields than mothers (35.3%).

Influence to become science student

Influencing factors written by respondents include father, mother, brother, personal interest, teacher and role model (Table 5). The highest influencing factor in this particular study was personal interest which was 52.9% for the male respondents and 58.9% for the female respondents. Parental influence is low for both genders compared to previous report (Alika, 2010). Teacher's influence was low between 11.8%-17.7%. Role model was very low (5.9%) which was recorded for a male respondents that further gave information on his role model as Ben Carson, which he got inspired through the reading of his books. Ogunlade and Akeredolu (2012) reported that guidance and counseling do influence students in the choice of their career. Guidance and counseling could be achieved through parents, teacher, and role models and through reading great books as being revealed in this study.

Table 5. Percentage (%) and frequency (F) of influencing factors on respondents to become science students by gender

Influencing factors	Female respondents		Male respondents	
	%	F	%	F
Father	11.8	2	5.9	1
Mother	5.9	1	11.8	2
Brother	11.8	2	5.9	1
Personal interest	52.9	9	58.9	10
Teacher	17.7	3	11.8	2
Role model	-	-	5.9	1

Differentiation of science from technology

Table 6 shows that more male respondents and (64.7%) could differentiate science from technology while lower number of female students (41.2%) could correctly differentiate science from technology. This means that there are still some science students that see science and technology as the same and could not differentiate of the two terms.

Definition of science and technology

Only three female respondents (17.7%) of the seventeen could correctly define the term science (Table 6). More male respondents 64.7% (11 out of 17) were able to correctly define the term science. Only one female respondent (5.9%) was able to correctly define term technology while more male respondents but less than average (47.1%) were able to correctly define the term technology.

Knowledge of basic sciences and applied sciences

Only one (5.9%) female respondents could identify two pure science fields correctly to while none of the female respondents could identify two applied science field correctly (Table 6). For the male respondents, lower than average (17.6%) could mention two pure science fields and 29.4% could write two applied science fields correctly.

Table 6. Percentage (%) and frequency (F) of respondents in correctly answering key questions in section C of pre-test

Key questions	Female respondents		Male respondents	
	%	F	%	F
Is science the same as technology? Yes or No	41.2	7	64.7	11
Define science	17.6	3	64.7	11
Define technology	5.9	1	47.1	8
Do you know your future career?	64.7	11	82.4	14
Identify two pure science discipline	5.9	1	17.6	3
Identify two applied science discipline	-	-	29.4	5
Have you heard about food science/ technology discipline?	35.3	6	47.1	8
If yes, what is food science/technology about?	17.7	3	29.4	5
Have you heard of the word entrepreneurship? Yes or No	35.3	6	82.4	14
If yes, what is entrepreneurship about?	23.3	4	47.1	8

Future career choices

More than average of both the male and the female respondents could identify their future career choice (Table 6). The female respondents were 64.7 % while the male respondents were more, 82.4%. In Table 7, the dominant career choice for both gender was medicine; female respondents was (35.3%) and for the male (29.4%). Totality of female with career choice in technology fields was 23.6 (civil and computer engineering) and more for male respondents 41.3% (in aeronautical, chemical, civil, elect elect, food, mechanical and petroleum engineering fields). Only one male (5.9%) opted for food science and technology related field and no female which equals 17.4% of the total respondents. Also one male (5.9%) showed interest in agricultural science which makes a total of two students (11.8%) with interesting the future in agricultural related field (food engineering and agricultural science). This study from Table 7 shows that even though some of the female students and more of the male students opted for career choices in the field of the technology especially engineering, their inability to correctly define term technology from Table 6 shows that their personal interest in this disciplines is not motivated by their personal understanding of what the disciplines really entails.

Table 7. Percentage (%) and frequency (F) career choices of respondents by gender

Gender	Career choice	%	F	Total in technology field (%) F
Female	Civil engineering	11.8	2	(23.6) 4
	Computer engineering	11.8	2	
	Medicine	35.3	6	
	Pharmacy	5.9	1	
Male	Aeronautical engineering	5.9	1	(41.3) 7
	Animal science	5.9	1	
	Chemical engineering	5.9	1	
	Civil engineering	11.8	2	
	Computer science	5.9	1	
	Electrical engineering	5.9	1	
	Food engineering	5.9	1	
	Mechanical engineering	5.9	1	
	Medicine	29.4	5	

Knowledge of food science and technology

Less than average of the respondents, female (35.3%) and male (47.1%) respectively have heard of food science and technology as a discipline, 17.7% of the female respondents and 29.4% of the male respectively could write what it was

about (Table 6). FST is often categorized under engineering or agriculture in some institutions bearing different names as food science, food science and engineering, food technology, food science and nutrition depending on area of focus of the institution. Table 7 shows that only one student (male respondent) was interested in future career in food science and technology (food engineering). This further confirms the need for sensitization of students for future career choices in this discipline.

Knowledge of entrepreneurship

Female respondents (35.3%) and more male respondents (82.4%) have heard of the term entrepreneurship while 23.3 % of the female respondents could write what entrepreneurship was about and less than average of the male respondents (47.1%) could really write what it was about.

Post-test

Table 8 shows the result obtained after the post-test. The data showed better understanding gained in the areas of knowledge of science and technology (S&T) especially in terms of the differentiation of the two terms. Female respondents (82.4%) were able answer correctly. Better understanding in the field of food science and technology, the word entrepreneurship and various food enterprises were also gained.

Table 8. Percentage (%) and frequency (F) of respondents in correctly answering post-test questions

Key questions	Female respondents		Male respondents	
	%	F	%	F
Is science the same as technology? Yes or No	82.4	14	100	17
Do you now have better understanding of food science/technology discipline? Yes of No	100	17	100	17
Do you now have better understanding of entrepreneurship? Yes or No	82.4	17	94.1	16

Some students mentioned some food enterprises for income generation they were willing to practice. The male respondents were fruit juice processing (29.5%), soymilk processing (23.6%), roselle drink processing (5.9%) chinchin processing (5.9%) and yam flour (5.9%) processing while the female respondents; 5.9% were willing to practice fruit juice processing, 5.9% for kunu processing, 11.8% for roselle drink processing and 23.6% for soymilk processing

Conclusion

The study shows higher number of student than average in both gender were personally interested in science in comparison with previous reports of higher parental influence. Higher number of male students were aware than female students in differentiating science from technology in defining the identifying, understanding the various disciplines involved. Less than 50% of the male and female students were aware of the field of food science and technology and only 5.9% have interest in food engineering (FST field) in the future despite its importance in contributing to food security in the nation and also in creating job opportunities for entrepreneurship. Proper education is vital to create interest in science and technology especially through guidance and counseling and sensitization of teachers and mentors/role model which in this study reflects the need for more attention. This study therefore justifies the need to continue creating awareness of the field of food science and technology among secondary school students for future career choices not just as a discipline but a field where income generating opportunities through food enterprises could be engaged.

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