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Original Research Article

Impact of Cultural Beliefs on Students' Interest in Basic Science and Technology among the Tiv Ethnic Group in Benue State, Nigeria

Dr. S. A. Adeniran[1], M. J. Yaapera[2]

[1,2]Department of Science Education, Federal University of Agriculture, Makurdi, Benue State, Nigeria

Corresponding Author: S. A. Adeniran

ABSTRACT

This study investigated the impact of cultural beliefs on students' interest in Basic Science and Technology among the Tiv ethnic group in Benue State. The study was a survey research design. Upper basic education students formed the population of the study. A sample of 100 students from five randomly selected secondary schools was used. Instrument used were Tiv Cultural Beliefs Questionnaire (TCBQ) and Basic Science Interest Inventory (BSII). Two research questions were asked and answered. Two hypotheses were formulated and tested. Data were analyzed using mean, standard deviation, and student t-test. The results showed that there was a significant difference between cultural beliefs ratings and students' interest in Basic Science and Technology. There was no significant difference between the cultural beliefs ratings of male and female students. It was concluded that Tiv cultural beliefs have negative impact on students' interest in Basic Science and Technology but gender has no effect on Tiv cultural beliefs. It was recommended that workshops and seminars should be organized for serving Basic Science and Technology teachers. The findings and recommendations of this study will be of benefit to Basic Science and Technology teachers and curriculum developers

Key Words: Culture, Beliefs, Interest and Attitude

INTRODUCTION

Nations all over the world including Nigeria are striving to develop scientifically and technologically. This is because science and technology contributes enormously towards extending the intellectual horizons and also in solving many societal problems. Following the decision of the Federal Republic of Nigeria to revise the 9-year basic education curriculum in 2012, Nigeria Educational Research Development Council (NERDC) restructured Basic Science education curriculum to formed Basic Science and Technology both at lower basic through upper basic education (NERDC, 2013). Basic Science and Technology (BST) is a product of Basic Science, Basic Technology, Physical and Health Education, and Computer Studies/Information Technology. One of the objectives of the Basic Science and Technology is developing students' interest in science and technology (NERDC, 2013).

Despite the importance of Basic Science and Technology to individuals and society globally, students' interest in Basic Science and Technology have been poor in Nigeria in general and Benue State in particular. In Nigeria for instance, over the years, it has been observed that quite a number of students on getting to senior secondary school drop out of science classes (Eriba, 2013). The trend was described with such terms as "a swing away from science", "a

movement away from science", "a drift away from science", "a shying away from science" and "unimpressive enrolment in science" (Eriba, 2013). It has also been observed by educators that the negative attitude of students in the core science subjects at the senior secondary school level stemmed from their poor interest in science at the Junior Secondary School (Oludipe, 2012). This ugly trend is capable of preventing the attainment of the objectives of Basic Science and Technology.

Most researchers are of the views that, the cultural background of students may influence their interest in science subjects (Ornek, 2015; Agogo & Agogo 2014; Ododo, 2014; Dagba, Sambe & Shomkegh, 2013. Culture according to Agogo and Agogo (2014) is the ways of life of a given group of people, which makes them unique. It is a way of life fashioned by a people in their collective endeavour, live and come to terms with their total environment. To Doki (2009) culture is a home in which family ethics, codes of conduct, conditions, aspirations, values and beliefs are accommodated. A belief on the other hand is a mental attitude of acceptance or assent towards proposition without the full intellectual knowledge to guarantee its truth (Eriba, 2002). According to Akama (2001) in Africa, the people's basic beliefs ultimately constitute the people's world view, which in turn influence their culture. Therefore, cultural beliefs can succinctly be defined as unique superstitions of a group of people.

Some cultural beliefs favoured various aspects of science and technology (Dagba, Sambe & Shomkegh, 2013). While there are other cultural beliefs that run contrary to what science and technology teaches (Eriba, 2002). The fact remains that there could be conflict between science and cultural beliefs (Eriba, 2002), this to some extent may influence students' interest in science and technology negatively. Dike (2008) affirmed that the world view of any member of the society is dependent on the socio-cultural structure of that society. In the same view, McLeod (2014) emphasized that cultural beliefs affects and shapes intellectual development of an individual. The level of development of a given society however, may determine the extent to which culture may affect her citizens. In this regard Nder (2013) observed that globalization and westernization largely affects culture of Tiv people to a verge of extinction. Hence, this study examined the impact of cultural beliefs on students' interest in Basic Science and Technology among Tiv ethnic group in Benue State.

Adodo and Gbore (2012) observed that at any level of graduation, learners will learn better in subjects they have interest in. This implies that students' interest in a subject may lead to high achievement in such a subject and the vice versa. Thus, interest is a power and strength towards realization of the goals.

Educators like Agogo and Agogo (2014) and Trumper (2006) reviewed that girls are more superstitious than boys because many of the cultural practices and restrictions are directed more at females than at their male counterparts. Would this be true among the Tiv students at upper basic education level in Benue State? Hence the researcher was motivated to carry out this study.

The theoretical framework of this study was based on the two theories. These are the social judgment theory and the cognitive development theory. The social judgment theory proposed by Shelrif and Hovland (1961) focuses on how people's prior experiences distort their perceptions of the positions advocated in persuasive messages, and how such perceptions mediate persuasion. This implies that if the child had prior experience that is scientifically and technologically friendly then he/she will perceive science and technology positively and develop interest in science and technology and vice versa. While cognitive development theory proposed by Vygotsky (1986) on the other hand believes strongly that community plays a central role in the process of making

meaning. This means that the child belief in what the community believed in and teaches. If the community belief in things that are scientifically accepted, then the child who is coming from such community will accept science and technology and have interest in science and technology but if otherwise the child will refuse to study science and technology.

Statement of the problem

One glaring unfortunate situation bedeviling Science and Technology Education in Nigeria for the past three decades is students' interest in science and technology at the secondary school level. Cultural beliefs of students have been found to be important factor affecting students' interest in science. This is responsible not only for the observed students' poor interests in science and technology but may also account for the declining in number of students' enrolment into science related courses generally. It has also been observed that students' gender may determine the limit at which cultural beliefs affect them.

Even though cultural beliefs have been found to influence the study of science and technology, the extent to which it influenced students' interests in Basic Science and Technology among Tiv students at upper basic education level in Benue State is not ascertained. Hence, this study investigated the impact of cultural beliefs on students' interest in Basic Science and Technology among Tiv ethnic group in Benue State, Nigeria. The study also compared the cultural beliefs of male and female students in Basic Science and Technology in Benue State, Nigeria.

Purpose of the Study

The purpose of this study was to investigate the influence of cultural beliefs on students' interest in Basic Science and Technology among the Tiv ethnic group in Benue state, Nigeria. Specifically, the study was to:

1. investigate the impact of cultural beliefs on students' interest in Basic Science and Technology.
2. find out the mean difference in cultural beliefs of male and female students in Basic Science and Technology.

Research questions

This study was guided by two research questions.

1. What is the difference between rating of students on cultural beliefs and students' interest in Basic Science and Technology?
2. What is the mean difference in the ratings of cultural beliefs of male and female students in Basic Science and Technology?

Research Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance

$H0_1$: There is no significant difference between the ratings of students on cultural beliefs and students' interest in Basic Science and Technology.

$H0_2$: There is no significant difference between the ratings of male and female students on their cultural beliefs in Basic Science and Technology.

Significance of the study

The findings and recommendations of this study will be of benefit to Basic Science and Technology teachers and curriculum developers. Basic Science and Technology teachers will benefit from the findings, based on the fact that they will be aware that some cultural beliefs influence students' interest in Basic Science and Technology. Hence, they will employ strategies that will motivate students to study Basic Science and Technology. Curriculum developers will be aware of influence of cultural beliefs on students' interest. Therefore, they will pay attention on issues in science and technology that contradict cultural beliefs and include strategies the will motivate students to learn all the topics in the science and technology curriculum.

METHODOLOGY

The survey design method was used for this study because a relatively large number of students were considered to be

the representative of the entire group. Benue State comprises of three Senatorial Districts (Zones) which are Zones A, B and C. This study was concerned with only Zones A and B because the study examined the impact of Tiv cultural beliefs on students' interests in Basic Science and Technology. Students in Zones A and B were considered because the study was concerned with Tiv cultural beliefs and Tiv students were found in these zones. Zones A and B comprises of 14 Local Government Areas out of 23 Local Government Areas in Benue State. The Local Governments are dominated by Tiv ethnic group. The major occupation in these areas is crops farming.

The target population of this study was all Tiv students of upper basic education 1 (JSS1) in Zones A and B of Benue State. A total number of 100 Tiv upper basic education 1students were randomly sampled from five Universal Basic Education (UBE) Schools in the two Senatorial zones A and B. A total of 20 students were randomly selected in each school. There were 55 male and 45 female students. Multiple stage simple random sampling technique was used in selecting both the schools and the students.

Two instruments were developed to collect data for this study. These were Tiv Cultural Beliefs Questionnaire (TCBQ) and Basic Science and Technology Students' Interests Inventory (BSTSII) both TCBQ and BSTII were adapted. Both TCBQ and BSTII have four points rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). Positive statements were rated 4,3,2,1 for strongly agree, agree, disagree and strongly disagree respectively while negative statements were rated in the reverse order of 1,2,3,4 where the higher value 4 takes the most negative option which is strongly disagreed.

The validation of the instruments for this study was done by one expert in science education, one Basic Science and Technology Teacher and one expert in measurement and evaluation from Nigeria University. To ensure the reliability of the instruments of this study a trial test was done with 20 JSSI students who were not part of the sample using the TCBQ and BSTII. In testing the reliability of the TCBQ and BSTII Cronbach alpha coefficient was used and gave to a value of 0.72 and 0.68 for TCBQ and BSTII respectively. Cronbach alpha coefficient was used to test the reliability because the instruments provide responses on a continuum scale.

The instruments were administered in the selected schools by the researcher with the assistant of the Basic Science and Technology teachers. The instruments were collected and marked for analysis. Data were collected and analyzed using descriptive and inferential statistical tools. Research questions were answered using mean and standard deviation. Research hypotheses were tested using student t-test.

RESULTS

Research Question 1: What is the difference between the rating of students' cultural beliefs and students' interest in Basic Science and Technology?

Table 1: The mean and standard deviation of difference between the ratings of students' cultural beliefs and students' interest in Basic Science and Technology

Variable	No. of cases	Mean	Std. Deviation
students'cultural beliefs	100	82.6	14.2
students' interest	100	68.4	9.3

From table 1, the result shows that students' cultural beliefs ratings have a mean score of 82.6 with standard deviation of 14.2 while students' interest ratings have a mean score of 68.4 with standard deviation of 9.3. This implies that there is difference in the ratings of students' cultural beliefs and students' interest in Basic Science and Technology. The mean of students' cultural beliefs is higher than the mean of students' interest. The ratings of students' interest were more homogenous than the ratings of students' cultural beliefs.

Research Question 2: What is the mean difference between the cultural beliefs of male and female students in Basic Science and Technology?

Table 2: The mean and standard deviation of difference between the cultural beliefs of male and female students in Basic Science and Technology

Gender	No. of cases	Mean	Std. Deviation
Male	55	78.4	10.6
Female	45	80.3	7.7

From table 2, the result shows that male students have a mean score of 78.4 with standard deviation of 10.6 while female students have a mean score of 80.3 with standard deviation of 7.7. This implies that there is difference in the ratings of cultural beliefs of female and male students. The mean of male students is higher than the mean of female students. The ratings of the female students were more homogenous than those of their male counterpart.

Hypothesis 1: There is no significant difference between the ratings of students' cultural beliefs and students' interest in Basic Science and Technology.

Table 3: t- test for the difference between students' cultural beliefs and students' interests in Basic Science and Technology

Variable	Mean	S.D	DF	T-cal.	T-crit.	Remark
Students' cultural beliefs	82.6	14.2	99	8.4	1.98	significant
Students' interest	68.4	8.7				

From table 3, the t-test calculated value of 8.4 is greater than the t-critical value of 1.98 at 0.05 levels of significance with 99 as the degree of freedom. The null hypothesis is therefore, rejected implying that there is significant difference between the cultural beliefs and students' interest in Basic Science and Technology at upper basic education level in Zones A and B Senatorial Districts of Benue State.

Hypothesis 2: There is no significant difference between the ratings of cultural beliefs of male and female students in Basic Science and Technology.

Table 4: t-test for the difference between cultural beliefs of male and female students in Basic Science and Technology

Gender	N	Mean	Std. D	DF	t-cal.	t-crit.
Male	55	78.4	6.4	98	0.99	1.67
Female	45	80.3	7.3			

From table 4, the t-test calculated value of 0.99 is less than the t-test critical value of 1 .67 at 0.05 levels of significance with 98 as degree of freedom. The null hypothesis is therefore, accepted implying that there is no significant difference in the cultural beliefs of male and female students at upper basic education level in Zones A and B Senatorial Districts of Benue State.

DISCUSSION OF THE RESULTS

The results of this study as presented on table1 and 3 indicates that there is difference between students' cultural beliefs and students' interest in Basic Science and Technology and the difference is significant. This implies that if a student's cultural belief is high, student's interest in science and technology will be low and the vice versa. The result agrees with findings of Agogo and Agogo (2014) who states that cultural beliefs in Igede negatively affect development of Basic Science and Technology. The results however, disagree with the observations of Nder (2013) that the culture of Tiv is on verge of extinction. Hence, it may not have effect on the students' interest in the study of Basic Science and Technology. This disagreement may be because Nder did not carried out an empirical study before arriving at the conclusion.

Secondary, the results as presented in table 2 and 4 shows that there is difference in the cultural beliefs of male and female students. However, the difference in the cultural beliefs of male and female students is not significant. This is contrary to the study of Agogo and Agogo (2014) who reviewed that girls are more superstitious than boys because many of the cultural practices and restrictions are directed more at females than at their male counterparts. This disagreement may be as result of the use of different statistical tools in analyzing data. Whereas, Agogo and Agogo used simple percentage for data analysis, the present researcher used mean and standard deviation, and student t-test for

data analysis. Since, the use of simple percentage cannot determine the significant difference between the two groups. It could be the reason why Agogo and Agogo (2014) concluded that girls are more superstitious than the boys.

CONCLUSION

The findings of this study revealed that cultural beliefs have negative impact on students' interest in studying Basic Science and Technology at upper basic education level among Tiv students in Benue state. The findings also showed that there is no difference in the cultural beliefs of male and female students among Tiv students in Benue Sate, Nigeria.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Workshops, seminars and refresher courses should be organized for serving Basic Science and Technology teachers on how to educate students on negative effects of cultural beliefs.
2. Curriculum developers and authors of Basic Science and Technology textbooks should make extra efforts to use some cultural practices and related misconceptions to illustrate scientific and technological concepts in order to explain them adequately and promote meaningful learning. Similar studies should be carried out in other Nigerian communities for the purposeof comparison and to broaden the empirical base of this study.

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