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SUPERSTITIOUS BELIEFS AND ACADEMIC PERFORMACE OF SENIOR SECONDARY SCHOOL PHYSICS STUDENTS

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Abstract

The study aimed at determining the level of believe in superstition held by physics students in Nigerian Secondary schools, as well as the influence of such beliefs on the academics performance of the students concerned. 114 2 Senior Secondary one (SS1) physics students selected from schools in Cross River State of Nigeria were used in the study. Data Generated in the study using the Superstitious Belief Questionnaire (SBQ) and Physics Achievement Test (PAT) were analysed using a 3x3x3x3 factorial Analysis of Covariance (ANCOVA). The influence of superstitious beliefs on the subjects' academic performance was investigated together with their reasoning and understanding of physics concepts as well as their creativity given their gender. The results of the study show that 56.1% of the physics students in the study area hold to superstitious beliefs of one form or the other, and that about 49% of the variations in students' performance in physics is attributable to the joint influence of such beliefs and other cognitive variables such as reasoning ability, understanding and creativity.

Introduction

Man's fear arising from his inability to understand, control and predict natural events and phenomena which are either relevant or threatening his existence and well-being in his environment placed him in a confused state. The absence of modern science from the traditional cultures of the world prior to the time of its birth in western Europe gave rise to superstition as the child of events in man's attempt to control and predict nature (Ritcher, 1973.

As observed by Andy and Idiong (1997) members of the traditional societies are brought up from infancy to view natural phenomena around them from the perspective of supernatural forces. This is however, more likely peculiar to the third world countries.

As noted by Block (1994), superstitious beliefs abound when there is a combination of such factors as paganism, dogmatic orthodox religion that complicate explanation of natural phenomena based on scientific principles.

Superstition is a term employed to designate beliefs and usage not consistent with acceptance notion of reality and possibility, a belief system rooted in manipulation which exist in the realms of mystic or supernatural (Chamberlain, 1985).It probably exists in every society and environment and is capable of influencing the reasoning, thinking, creative and understanding of both children and adults. Bajah (1981:130) noted that:

> It is important that when young Africans are
> being introduced to the field of science by the
> teacher, he/she must first of all eliminate all
> superstitious ideas and until that is done, the
> teacher can only succeed in producing people
> with dichotomous minds, divided between
> scientific explanation and superstitious beliefs.

This assertion is supported by many studies in the sciences (Awokoya 1961; Bajah 1981: and Alonge 1982).

Baimba (1993) noted that the orientation of the African child with regards to his/her traditional practices, cultural activities and superstitious beliefs tend to repel any different explanation to events or concepts. These kinds of attitudes are normally observed in the traditional African societies where children grow up to see superstition as facts of life.

Ajikobi and Bello (1991:112) observed that:

> In the teaching learning situation, a scientific
> explanation which counters the belief of the
> learners are normally observed to evoke
> unwilling and unco-operating attitude,
> as such, the enthusiasm that would have
> normally accomplished such scientific studies
> becomes dampened.

A classic example of the effect of superstitious belief on a people is found in the experiences of.the people of Ababene and Ofodua communities in Adun Clan in Obubra Local Government Area of the Cross River State of Nigeria. These people, because of the belief that their ancestral spirits are responsible for the purification of their traditional water ponds on daily basis, continued to drink water from their guinea worm infested ponds called "Ekonta" "Egbegbe" and "Osi-binna".

In the area of birth and superstition, it is generally believed that women can only become pregnant and give birth to children if and only if their dead relations remember them. The question then is whether those women who have no children throughout their lives don't have dead relations? If they do, why are they not remembered?

In another instance, a highly educated man divorced his wife for not giving birth to a baby boy after four female children because it is superstitiously believed that the woman determines the sex of the child. The school science of sex determination by X and Y combination with the man (X) as the determinant fails to convince the man that he is responsible. Science teaching in the communities so far has not altered their beliefs.

According to Jahoda (1970), Science as a discipline in Africa is facing an uphill task because most African students and teachers still hold firmly to superstition. This kind of belief in most cases tends to buffer and contradict any modern approach to science. It makes the learning and teaching of science in Africa difficult because both the teachers and learners become confused as to which explanation is correct-scientific or superstition/culture.

Such confusions normally have effects on the cognitive structure of the leaner. Since academic performance of a leaner is a function of the cognitive structure of the learner, it may be implied that such confusions in the leaner may invariably influence the learner's academic performance.

Besides superstitious beliefs, factors such as reasoning ability (Onwioduokit 1998), level of understanding (Anderson 1978) and creativity, (Baron, 1964) are also known as being capable of influencing students performance in physics.

It is therefore the aim of this study to investigate the possible influence of superstitious beliefs on students academic performance, vis-à-vis their reasoning ability, level of understanding and creativity, given their gender.

Research questions

Answers to the following questions were sought for:
(1)   What is the extent of students' believe in superstition?
(2)   To what extent does superstitious beliefs influence students', academic performance in physics with respect to their reasoning, understanding and creativity given their gender?

Hypotheses

(i)   Physics students in Nigeria do not hold any superstitious beliefs
(ii) Superstitious beliefs have no significant influences on the academic performance of physics students vis-a-vis their gender

Research Method

One thousand, two hundred (1, 200) Senior Secondary one (SS1) physics students drawn from forty (40) out of the hundred and twenty (120) Secondary Schools in Cross River State were used for the study.

To ensure a spread, ten (10) schools were randomly selected from each of the four- (4) zones created by the State Post Primary Schools Management Board.

Thirty (30) students were randomly selected from each school. The use of SS1 physics students was borne out of the fact that this category of students are newly introduced to separate science and are more likely to experience the effect of superstition, if any, in their academics.

Two research instruments namely; Superstitious Belief Questionnaire (SBQ) and Physics Achievement Test (PAT) were developed and used by the researchers.

SBQ had a total of 96 items designed by adapting Bajah's (1981) categorization – Good luck, bad luck, impending danger and explanation of perceived effects structured using a 5 –point Likert scale, SBQ was used to identify the levels of superstition held by physics students.

PAT had fifty (50) multiple choice items, face-validated by a team

of experts. It was developed from those physics concepts claimed to have been taught by the physics teachers and from areas of general knowledge. It aimed at indicating the level of performance of students in physics.

Tests on reasoning ability (RAT), understanding (TUM), and creativity (CRET), were adapted from Onwioduokit (1989).

These instruments were validated by pilot testing them within a sample outside the area and population of study. Resulting from the test, further modifications were made. Reliability indices using Kudar Richardson formula (KR-21) yielded 0.93 for Superstitious Beliefs Questionnaire (SBQ), and 0.79, 0.68 for the physics Achievement Test (PAT) on reasoning, understanding and creativity, respectively. The significantly high reliability indices imply that the instruments were valid and reliable.

Data Collation and Analysis

The instruments were administered by the researcher directly on the population of the sample. The questionnaire attracted a maximum of five (5) points for each item of the 96-item questionnaire and a minimum of one point (1) for each item. While the Physics Achievement Test (PAT) as well as those on reasoning understanding and creativity attracted a maximum of 100% and a minimum of zero percent.

The data generated in the study were analyzed using factorial analysis of covariance.

Results

TABLE 1: Extent of students believe in superstition with respect to good luck, bad luck, impending danger and explanation of perceived effect.

Variable	Factor Loading (R)	Communality (R2)	Eigen value	PCT of value	CUM.PCT
Good luck	0.77453	0.59990	2.24580	56.1	56.1
Bad luck	0.76166	0.58012			
Imp. Danger	0.73783	0.5440			
Perc. Effect	0.72206	0.52138			

From the table above, it shows that about 60% of the total variances in superstitious beliefs is attributed to believe in good luck, 58% to bad luck, 54% to impending danger and 52% to explanation of perceived effects. The table also shows a communal percentage (PCT) of 56.1% implying that these factors constitute 56.1% of the belief system of physics students.

Since 56.1% is a reasonably high percentage, it could therefore be concluded that more than average number of physics students in Nigeria believes in superstitions. Hypothesis one is therefore rejected in favour of its alternative.

Table 2: Summary of 3x3x3x3 analysis of covariance on the Performance of Students in Physics attributable to Superstitious beliefs, reasoning, understanding, creativity with gender as covariant

Sources of Variation	SS	DF	MS	F	Decision at P<.05
Covariant: Gender	4587.16	1	30.05	30.05	
MAIN EFFECTS					
Superstitious Beliefs	21354.27	2	10677.13	69.95	*
Reasoning	8151.89	2	4075.94	26.70	*
Understanding	1773.81	2	886.91	5.81	*
Creativity	25594,74	2	127.97	83.83	*
2-WAY INTERACTION					
Sup and Und	25.96	4	81.49	0.54	NS
Sup and Cre	445.45	4	111.36	0.74	NS
Sup and Rea	1689.90	4	422.47	2.80	*
Und and Cre	242.55	4	60.64	0.40	NS
Und and Rea	871.62	4	217.91	1.45	NS
Cre and Rea	250.01	4	62.50	0.42	NS
Explained	167086.72	3	5063.23	33.59	
Residual	267009.83	1108	150.73		
TOTAL	334086.54	1142	292.81		

* Significant at P<. 05	Und	=	Understanding
NS - Not significant at P<. 05	Cre	=	Creativity
Where Sup = Superstition	Rea	=	Reasoning

As shown in the Table 2 above, superstitious belief (F_2, 1142 = 69.95), Reasoning (F_2, 1142 = 26.70), Understanding (F_2, 1142 = 5.81), and creativity (F_2, 1142 = 83.83), have significant influence on students' academic performance in Physics.

In the 2-way interaction, superstition shows a highly significant influence on the reasoning ability of physics students. This implies that students' superstitious beliefs are influenced between reasoning independent ability.

Since there was an overall significant influence of variables as

shown in Table 2 above, a multiple classification Analysis (MCA) of the factors considered becomes pertinent. This was to determine which of the factors was most influential.

TABLE 3: Multiple Classification Analysis (MCA) of 3 X 3 X 3 X3 Analysis of covariance regarding the performance of students in Physics

Grand mean 43.33	N	Unadjusted		Adjusted for Independent Variable and Covariant	
Variable + Category		Dev'n	Eta	Dev'n	Beta
SUPERSTITION 1. Very superstitious 2. Averagely superstitious 3. Superstitious	542 361 239	8.09 -6.96 -7.87	0.45	4.82 -4.14 -4.68	0.27
REASONING 1. High 2. Average 3. Low	713 348 81	-6.34 8.14 20.82	0.51	-2.51 3.23 8.19	0.20
UNDERSTANDING 1. High 2. Average 3. Low	912 201 29	-3.85 15.06 16.60	0.45	0.79 2.99 4.29	0.09
CREATIVITY 1. High 2. Average 3. Low	855 251 36	-5.97 17.22 21.61	0.60	3.56 10.58 10.78	0.36

Multiple R. Squared = 0.49
Multiple R = 0.70

The Table 3 above shows that superstitious belief have an index of relationship of 0.27 with those of reasoning, understanding and creativity as 0.20, 0.09 and 0.36 respectively. With a multiple regression index (R) of 0.70 and R^2 of 0.49, it implies that 49% of variations in students performance in physics can be attributed to the joint influence of students' belief in superstition and their reasoning, understanding and creativity.

Discussion

The findings of this work as shown in Table 1 show that more than

the average number of physics students involved in this study belief in superstition.   This implies that hypothesis one stands rejected in performance of its alternative. It also shows that physics students do not only believe in superstition but also in the categorisation postulated by (Bajah, 1981).

From this study 60% of the variation in students believed in superstition is attributable to the belief in good luck. Since this is a high percentage, it means that the life of most Africans have a high dependency on expectancy of Bad luck.

This result is an agreement with what Ajikobi and Bello (1991) claimed that African children are imbued in superstitious beliefs. This imbued beliefs are pertinent because of their crucial role of acting as a vanguard force for controlling the thinking and actions of members of a given society as to make their behaviour uniform and predictable in any given circumstances (Idiong and Andy, 1997).

The findings also tend to support Lovell's (1978) opinion that cognitive development is influence by two factors; Heredity and Environment. The beliefs are inherited while a true African environment is becloud with superstitions, thus making the African child to grow with superstition as facts of life.

From Tables 2 and 3, it is evident therein that superstitious belief have a significant influence on the academic performance of physics students.   It also shows that 49% of the variation in students' performance in physics may be attributed to the joint influence of superstition and other cognitive variables considered in the study.

This findings agrees with Ajikobi,s and Bello,s (1991) observation that superstition creates negative attitudes towards the teaching and learning of the sciences in general and physics in particular. To this end, Bajah, (1981) noted that to effectively teach physics, the teacher should first of all try to eliminate all superstitious beliefs associated with a given scientific concept for maximum learning to take place.

It can be inferred from these findings that superstitions are one of those factors responsible for the low level of development in this part of the world. It probably buffers us from being creative and hinders some African researchers from venturing into certain projects of cultural biases.

Based on the findings of this study, it is recommended that physics teachers in particular and science teachers in general should as much as possible understudy the cultural background of the children they are teaching. This is expected to assist the teacher in knowing how best to help the students out of superstitious beliefs that are capable of hindering performance in schools.

References

Ajikobi, S. O. and Bello, G. (1991). Nigeria societal beliefs and language Effect on the teacher and learning process in science. 32nd Annual Conference proceedings of the science Teacher's Association of Nigeria (STAN), pp. 98-115.

Alonge, E. I. (1982). The relevance of traditional methods in modern Education: A quest for relevant science Education in Africa. Journal of science Teachers' Association of Nigeria, Vol. 21 (1), Pp. 34.

Anderson, R. O. (1978). The experience of science: A new Perspective for Laboratory_Teaching. New York: Columbia University Teacher's College Press.

Awokoya, S. O. (1961). Science Education in Africa. Massachusetts: Educational Services Incorporated, pp. 23-24

Biamba, A. (1993). Science knowledge/Cultural interface: Implication for *Science Education in non-western cultures: Journal of Science Teachers' Association of Nigeria, Vol. 28 (1&2), 13-19.*

Bajah, S. T. (1981). Dichotomy of science and superstitions beliefs: Recognition in Science Education for Africa. Journal of STAN, vol. 20 (1), 21-29.

Block, D. (1994). Scientific basis of beliefs. South Africa Star. Johannesburg: University of Johannesburg

Chamberlain, P. J. (1985). Superstitious beliefs and the learning of Science in a Developing country. In Harrison, E. B. (ed.) World Trends in Science and Technology Education, Nothingham: Treat Polytechnic.

Idiong, A. R. and Andy, E. B. (1997). Science and Superstition. *Inyang N. E. U. and Ekah, M. E. (ed.) science and society Uyo:* Afahaide and Bros. Publishing Co.

Lovell, K. (1978). Educational Psychology and Children. London: University of London Press.