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ETHNOSCIENCE-ENRICHED INSTRUCTIONAL STRATEGY AND THE TRADITIONAL TEACHING APPROACH- A PARADIGM SHIFT

[1]HASSAN ABDULLAHI MISAU, [2]GARBA ABDULMUMINI & [3]GARBA SHEHU
[1]School Of Remedial And Continuing Education (SORCE), College Of Education, Legal And General Studies Misau, Bauchi State [2&3]Chemistry Department Aminu Saleh College Of Education, Azare Bauchi State

ABSTRACTS
Science teaching and learning today is faced with myriad of challenges and problems among which is persistent poor performance of students in public examinations such as WAEC, JAMB, NECO and NABTEB. Many researchers in Science education attributed this problem to poor method of teaching being employed by science teachers in classrooms, specifically, the excessive use of lecture teaching method. Hence, they suggest the need to employ the use of more innovative and more learner-centered teaching approaches, among which is ethnoscience-enriched instructional strategy. This paper examined the meaning and efficacy of this instructional strategy over the lecture method of teaching and review some empirical studies conducted on it and finally in the conclusion part recommend its usage to our science teachers as a solution to the problem of poor student's performance in sciences.

Keywords: Ethnoscience-Enriched Instructional Strategy, Traditional Teaching, Approach, Paradigm Shift

INTRODUCTION

Science teaching and learning today is faced with myriad of problems that have led to many researches and innovations aimed at providing lasting solutions to the problems. Most notable among the challenges facing science teaching today is the persistent poor performance and failure of Science students recorded in public Examinations, namely: JAMB, WAEC and NECO over years.

Table 1 below shows Bauchi state student's performance in chemistry in WAEC from 2009-2018.

Bauchi State West African Examination Council Chemistry results from 2009-2018.

Year	Total No of Registered	of students with credit and above	% pass with credit	No students with pass and below	% with pass and below
2009	1,205	43	3.56%	1,162	96.44%
2010	1,345	45	3.34%	1,300	96.66%
2011	1,543	57	3.78%	1,447	96.22%
2012	1,504	89	5.91%	1,424	99.22%

2013	1,467	80	5.45%	1,387	94.55%
2014	1,627	59	3.62%	1,568	96.38%
2015	1,431	73	5.10%	1,358	94.90%
2016	1,634	50	3.09%	1,584	96.91%
2017	1,579	78	4.93%	1,501	95.05%
2018	1,424	154	10.81%	1,270	89.19%

Source: Bauchi State ministry of education

Various researches conducted by eminent science educators and scholars, attributed students poor performance in sciences to the traditional teaching approach (Lecture method) been predominantly used by the science teachers. This traditional lecture method, researchers opined, is a teacher-centered approach which is devoid of involving the learner actively in the teaching and learning process. So also researchers have propounded alternative science teaching approaches aimed at reducing the faults of the traditional teaching approach, among them is **Ethnoscience -enriched instruction strategy.** This paper aim at exploring the efficiency and efficacy of this innovative teaching approach, so that science teachers, educators, curriculum developers and planners as well as administrators would be better informed about this novel teaching approach and to start applying it in our science classrooms in order to bring about a paradigm shift in the area of science teaching and learning in Nigeria, Africa and world at large.

What is ethnoscience?

Ethnoscience has been defined as cultural practices of a given people that have direct bearing to science or can be scientifically defined. It includes their practices of looking after themselves and their bodies, their botanical knowledge, and their forms of classifications (Augé, 1999; Abonyi, 2002). Ethnoscience is a term and study that came into anthropological theory in the 1960s. Often referred to as "indigenous knowledge," it introduces a perspective based on native perceptions. Ethnoscience looks at the intricacies of the connection between culture and its surrounding environment (Abonyi, 2002). It refers to the materials, ideas, and beliefs from the students' environment and technology therein. This is derived from the past and present cultural traditions of the people which in turn evolved from myth, supernatural, popular and mystical realties and beliefs as well as from ongoing acculturation process (Abonyi 1999).

Ethnoscience according to Sanga (2004) is defined as the knowledge that is indigenous to a particular language and culture. Perceived from the same dimension, Ogunbunmi and Olaitan (1988) conceived ethnoscience as the study which approximates or reflects the natives own thinking about how their physical world is to be classified. Ethnoscience

can assist students in exploring the differences between related scientific concepts, Ethno science is therefore the scientific ideas, practices, concepts and technological applications that are embedded in cultural practices, values, and customs, believes and the environment of particular people. Hence, Ethnoscience-enriched-instruction is a teaching strategy that makes use of the cultural beliefs, values, knowledge, traditional practices and environmental resources of the learner to bring about proper understanding of scientific concepts to which the learner is exposed.

Ethnoscience otherwise referred to as indigenous knowledge or culturally relevant science (Hayatu, 2005) is the local knowledge, which is embedded into community and is unique to a given culture, location and society. It has also been defined as those cultural practices of the people that have direct bearing to or can be scientifically defined. Fasasi (2017) defines Ethnoscience instruction to mean the instructional approach that systematically accesses and assesses the prior cultural beliefs and ideas of learners that are related to the science concept being taught to ensure a better understanding of the concept. Ethnoscience also known as ethnopedagogy is an effective tool for connecting science with culture, it relates the student's ethnic background to the world of modern science. It is a system of knowledge that provides an explanation of the natural world through an ethno-cultural perspective that is used for predictive purposes and has practical application. Ethnoscience is a cross disciplinary science that connects the human or cultural anthropology with the modern science learning. The study is gained by instilling the local scientific knowledge that is contained in the culture of an ethnic group or community. Local knowledge is derived from ideas of local communities about everyday life including traditional values, beliefs and cultures. Abonyi (2012) defines ethnoscience as the knowledge that deals with local perception, practices, skills and ideas and their underlying cosmologies in the context of processes of socio-economic development. Ethnoscience means the expression of scientific facts in indigenous language or native language, it also connotes materials, ideas and beliefs from the African or native environment and technology. (Abonyi, 2013). Ethnoscience embraces a number of disciplines namely: ethnobiology, ethnochemistry, ethnophysics, ethnomathematics, ethnomedicine and an array of indigenous agricultural practices and food processing technologies. The fundamental principle in these aspects of indigenous knowledge system is that the basic concepts and practices are enshrined in environmentally dependent and culturally reinforced knowledge, myths and supernatural (Abonyi, 1999). Therefore, the concept of ethnoscience is an all-embracing attempt to view and present modern science concepts through a native and cultural perspective, using the traditional environmental resources as tools and procedures, so that an African learner will understand and appreciate science as a knowledge that is part and parcel of his own culture, surrounding and his real world experience, not as an alien knowledge and ideas of the white people.

Ethnoscience-enriched instructional strategy:

Ethnoscience-enriched instruction strategy is premised based on the Ausubel Theory of meaningful learning which posits that prior knowledge plays a vital role in the student's learning. He observed that the human mind has a way of subsuming information in hierarchical or categorical manner in as much as the information or knowledge is linked to or incorporated with familiar pattern. Ausubel further stated that when relevant subsumers do not exist to link new materials with the previous knowledge, then advance organizers or alternative set of link or anchorage can be introduced. The advance organizers are meant to provide a link between what the students know and what they need to know. They also provide some mind set for the students to learn new things. The advance organizers occur against the experience of the learner that he/she obtains through his /her personal interaction with the environment. The nature of the environment in which the learner grows and lives in, affects his worldview and learning pattern. Linking learning to the learner's worldview provide good learning opportunities to the learners. However, these learning environments are classified into urban and rural environments. Learners in the urban environment are exposed to modern facilities and gadgets that shape their worldview thereby distracting them from several cultural practices. Conversely, learners in the rural areas are exposed to cultural practices like swimming, fishing, hunting, local blacksmithing, farming etc that expose them to several practices that shape their worldview (Hendrickson, 2010). Therefore, this theory highlighted the importance and the essence of the environment of the learner as well as the experiences he/she derives from the interaction with the environment

The development of ethnoscience-based learning tools is an approach in creating learning environments and designing learning experiences that integrate culture as the part of the learning process (Atmojo, 2012).Ethnoscience is a transforming activity between original science which consists of all knowledge about the facts of the society that comes from hereditary beliefs and still contains myths. The scope of ethnoscience includes the fields of science, agriculture, ecology, medicine, even including flora and fauna. (Rahayu and Sudarmin, 2015).

Scientific learning with ethnoscience approach relates learning with culture through extracting student' original views on culture, and then turn it into scientific knowledge (Sudarmin,et-al,2017).The implementation of this kind of learning has the potential to develop the ways of learning that provide a paradigm shift from teacher centered teaching and learning approach to student centered teaching and learning approach (Novitasari, et al,2017). Ethnoscience-based instruction is, therefore, a body of knowledge, and instructional approach derived from quantitative and qualitative practices, such as counting, weighing, measuring, analyzing, sorting and classifying based on nature. Ethnoscience-based instruction is vital because it bridges the gap of abstraction in teaching and learning. That is, it makes learning concrete and facilitates

better retention, since what is to be learnt is linked to the cultural or indigenous knowledge of the students.

Ethnoscience and Science Teaching and Learning

Ethnoscience otherwise referred to as indigenous knowledge or culturally relevant science (Hayatu, 2005) is the local knowledge, which is embedded into community and is unique to a given culture, location and society. It has also been defined as those cultural practices of a given people that have direct bearing to science or can be scientifically defined. It includes their practices of looking after themselves and their bodies, their botanical knowledge, and their forms of classifications (Sutherland & Dennick, 2002; Hayatu, 2005; Jerie & Matanga 2011). Ethnoscience is a term and study that came into anthropological theory in the 1960s. Often referred to as "indigenous knowledge," it introduces a perspective based on native perceptions. Ethnoscience looks at the intricacies of the connection between culture and its surrounding environment (Abonyi, 2002).

Ethnoscience/Indigenous knowledge is the knowledge used by local people to make a living in a particular environment. The terms used in the field of sustainable development to designate this concept include: indigenous technical knowledge, traditional environment knowledge, rural knowledge etc. such knowledge is creative, experimental and innovative in order to meet the need of changing conditions. Ethnoscience has the capacity to blend with the knowledge based science and technology thereby complimenting scientific and technological efforts to solve problems associated with understanding science concepts. Udofia, (2009) observed that the linking of science teaching to day to day activities of the learners will actualize and expand the learning process in the following ways:

1. Better understanding of concepts;
2. Enhanced creativity in learners;
3. Establish connection between theory and practice;
4. serves as bridge between classroom and environment;
5. Reduces the abstract ideas associated with science (Udofia, 2009), and enable learners to scientifically define their environment (Jerie & Matanga 2011).

The use of learners‟ local practices and environment in teaching and learning has been given several names by scholars like Aikenhead (2002), Fakudze (2004) and Rist and Dahdouh-Guebas (2006) that named it as ‘‘Indigenous knowledge’’, Snow in Michie, (2001) as ‘‘ethnoscience’’. The appreciation of the relevance of ethnoscience in science teaching began with the work of Snow in 1974. Since then, several works have been done to encourage learners from minority (disadvantaged groups: usually nonwestern societies) to cope with what is today identified as „western science‟. Even though lots of arguments have been put forward to the effect that the context of the science is not really

western as all cultures have elements of science, Aikenhead and Huntley (2004) observed that there is the need to appreciate that science teaching in the present content and contexts conveys a particular Eurocentric worldview due to the fact that science is a subculture of Western (Euro-American) culture. Thus, the world view differences that arise due to the child's local environment and that of western science, affects students enrolment and performance in science and hence the reason for low enrolment in science and science related jobs among African and Aboriginal students (Aikenhead and Huntley, 2004). This understanding of the way nonwestern learners acquire science made science educators like Aikenhead, Jegede, Fakudze, Rist, Dahdouh-Guebas etc. to venture into several studies of how to improve the status quo especially in the Canadian Aboriginal and some South African schools. Consequently, their studies (Aikenhead, Jegede, Oguniyi) in Fakudze (2004) lead to the development of learning theories and hypothesis that explain learning processes in relation to the learners environment and cultural background. These theories are:

i. Border Crossing theory (Aikenhead, 1996).
ii. Collateral Learning Theory (Jegede, 1995).
iii. Contiguity Learning Hypothesis (Ogunniyi, 2002).

These theories considered the nature of the learner relative to his home environment and made case that teachers should use relevant examples, practices, knowledge as well as principles that are related to learners‟ environment to demystify science. Veal (2001) after a study of the reasons for unpopularity of science in Africa observed that the science taught to students provides education

that is not applicable to local needs and it channels the labor forces towards a narrower, rather than wider, range of occupational opportunities. Thus, such poor skills acquired by learners, he opined, are applicable only for the absorption of transferred technology, rather than for local innovation. He therefore concluded that Africa must find efficient and convenient approach to developing and transmitting its existing scientific knowledge as well as reduce dependency on western science. This, he suggests, could be achieved through the use of local resources and/or indigenous knowledge otherwise referred to as **ethnoscience-enriched instruction.**

The Nigerian-UNESCO special Science improvement project national coordinator Dr. Boubacar Camara presented a paper on improving Basic Science titled: "a paradigm shift from active to effective learning. In the paper he observed that a lesson can be active but not effective. He asserted that teachers should facilitate the integration of life experiences and life values into their lessons. He elucidated a fundamental relationship linking education, culture and development through an equation. The equation is:

D = (E)(C) Where D = development, E = education, C = culture.

Njoku (2007) supported this assertion by saying that science teachers should link the learners already known information (prior knowledge) to information to be learnt.

Olorundare (2006) also opined that the teacher should use such knowledge by giving many examples from the environment. This will make learners get acquainted to science concepts and could improve their understanding of scientific concepts. Generally, indigenous knowledge involves such knowledge that is specifically adapted to the requirements of local people and condition. It is also creative, experimental and innovative to meet new conditions. Ethnoscience is a specialization of indigenous knowledge systems, such as Ethno-botany, ethno-zoology, ethno-medicine, etc. (Ingold, 2000). Njoku(2007) further explained that ethnoscience looks at culture with a scientific perspective. Ingold (2000) stressed that although most anthropologists abhor this definition. Hayatu, (2005) observed that ethnoscience helps to understand how people develop and shape their worldview with different forms of knowledge, beliefs and skills, it also focuses on the ecological and historical contributions people have been given. Ingold (2000), describes ethnoscience as been a cross-discipline. He concluded that ethnoscience is based on increased collaboration between social sciences and humanities with natural sciences.

Despite these assertions by scholars that science is related to culture and that instructional processes for teaching science should employ elements of culture in its practice, still in Nigeria and other African countries science concepts and methods of teaching them are treated as foreign. All cultures have scientific practices, ideas and concepts embedded in them which the people of that particular culture are practicing consciously or unconsciously, knowingly or unknowingly in their day to day life activities; therefore, in essence, Science is not a western monopoly or strictly a white people enterprise. All races and tribes of the world in a larger context are in one way or the other scientific in some of their practices or some of their life activities can be scientifically defined or explained. This is what ethnoscience is all about.

Certain Cultural Practices of Ethno- scientific Relevance

As stated in the introduction part of this work that all cultures have some scientific practices or some of their cultural practices can be scientifically defined, the following are some of the cultural practices that could be used to explain certain scientific concepts.

Cultural practices	Related scientific concepts
Black Smith Heating a Metal	(Heat conduction and transfer)
Black Smith Shaping a Heated Metal	(physical properties of metal)
Dying of textile materials and clothes	(Chromatography, color separation)
Putting potash to a soup when it became sour	(Neutralization reaction)
Smoking of fish and drying of meat for storage,	(oxidation-reduction reaction)
Using a charcoal as absorbent when drying flour from maize or guinea corn, etc.	(Absorption)

These relevant cultural practices are called "ethno-examplers". All science subjects have these "ethno-examplers, hence we have, ethnomathematics, ethno chemistry, ethno physics, ethno biology, ethnomedicine,etc, therefore, these ethnoexamplers should be identified and explored by the science teacher in collaboration with the learners to facilitate proper understanding of new scientific concepts being taught in our science classrooms.

Traditional Teaching Approach (Lecture method)

Traditional teaching method or approach commonly known as lecture method is the popular teaching strategy employed by most science teachers, it is a one-way traffic teaching method whereby the teacher is the sole source of the knowledge and dominant player of the lesson while, learners are passive recipients of the information and knowledge. Teacher does most of the talking and the learners listen and occasionally jot some notes. It is a chalk and board method of teaching.

However, some of its disadvantages are identified by Eya and Igbokwe (2000) as follows:

I. It does not develop student's manipulative skills in science, as they are passive listeners.

II. It does not cater for individual differences among the students, with the result that the slow learners and the academically weak students are dragged at the pace they cannot cope with. This may lead to low achievement and loss of interest.

III- The method appeals only to the sense of hearing. This makes the method not suitable for teaching science in the secondary schools. Alio (2002) stated that a complete learning takes place when the child uses all his senses in the learning process.

Iv- The major drawback of lecture method is that it is essentially a unidirectional mode of communication. The listening student in most cases has little or no information to influence the nature and rate of flow of information. One way communication offers little in the way of interaction and feedback, which is very essential for learning to occur.

V. When used excessively, the lecture method encourages intellectual passivity, which is the opposite of learning and may not develop in the students the processes of inquiry and problem solving. It is a teacher-centered approach. To address the drawbacks of the lecture method, there is need of employing a more innovative and learner-centered approach such as Ethnoscience-enriched instruction strategy.Some empirical studies on ethnoscience-enriched instructional strategyScholars in science education and researchers have established through various empirical studies the efficacy and effectiveness of ethnoscience-enriched instructional strategy in improving student's academic achievement and performance as well as retention of acquired knowledge. Although empirical studies on this relatively new innovative teaching strategy are limited, and some are olden literatures, however, for the purpose of this paper, some of these empirical studies were reviewed here so as to bring to the fore the advantages of this effective teaching strategy over the traditional Lecture method:

Muhammad (2013) observed the need for the inclusion of multi-cultural approach to the teaching of science. He observed that science teaching in Nigeria and other African countries is being challenged by the conflict between school and traditional society reflected in conceptual and instructional models; an interplay of psychological and socio cultural variables in the teaching and learning of science as well as a disjunction between science learned in school and what goes on in the lives of individual in the society. He further argued that this undue reliance on school science (western science), leads to regurgitation of facts and eventually rote memorization. To curtail these situations and contribute to the improvement of science and science literacy in Nigeria in particular and Africa in general, he ventured into the assessment of the effects of multicultural teaching approach to students concepts formation in biology. The study employed a quasi-experimental design, using a population of senior secondary II students in Kano state. The findings of the research revealed a significant effect of the multicultural approach to students‟ concept formation in biology. It also revealed that there is no gender disparity in terms of concept formation, when students are taught biological concepts using multicultural strategy (ethnoscience).

Usman (2011) conducted a correlational study on the relationship between cultural beliefs and scientific development in Nigeria by investigating the relationship between students‟ cultural beliefs and students understanding of Biology concepts. The study employed a correlational research design with 100 subjects sampled from two coeducational schools from Sabon Gari local government area of Kaduna state. The study however did not describe the treatment procedure, it is premised that the study was based on a survey design. The study found a significant relationship between the student's cultures and cultural beliefs and their understanding of Biology concepts. The study however reported a negative relationship in girls‟ performance with their cultural belief. He therefore concluded that some cultural beliefs need to be explained to the students in a scientific way to „probably‟ reduce the hindrance of the beliefs in the learning of biology. To explain this therefore requires a culturally enriched instructional procedure. Hence the need for ethnoscientific approaches in the teaching and learning of science.

Achor, Imoko and Uloko (2009) studied the effect of ethnomathematics teaching approach on senior secondary students‟ performance and retention in locus. Ethnomathematics teaching approach as used in their study involved taking the students out of class to practically undertake some culturally loaded activities like house roofing and farms layout. Specifically, they emphasized, students were made to roof houses, lay out some farms and in the process take measurements to be further used in calculation. Since the focus is Locus, emphasis was on straight line, circle/ellipse, trajectories and parabolic shapes.

The findings of the study showed that students taught with Ethnomathematics teaching approach had a higher mean performance score in Locus than their counterparts taught

with conventional approach. They reasoned that the difference in the means between experimental and control group was because the experimental group students were able to integrate or link their background of study and their immediate environment with the foreign aspect of the learning of Locus. They also argued that because the teaching was done in a practical way, it provided a "flow" from home to school and from school to one's trade and to everyday living. Thus the abstract nature of teaching and learning of mathematics seemed to have been reduced.

D'Ambrosio (2001), Uloko and Imoko, 2007; Uloko and Ogwuche, 2007) also reported that failure in mathematics in Nigeria is due to the fact that the teaching and learning is purely foreign in nature and confirmed that ethno mathematical instructional strategy influence students' retention. With these findings, Achor, Imoko and Uloko (2009) concluded that performance and retention in Locus depended on the approach of instruction and recommended the use of ethnomathematics teaching approach in mathematics lessons.

Another study is that of Abonyi (2002) who observed that the use of ethnoscience in instructions has been hindered by a lot of speculation as to the existence of gulf between the culture of the learner and that of the modern science. He highlighted that it is widely believed that cultural knowledge has no relationship with advanced scientific knowledge and therefore unnecessary in science instruction. These speculations are however not backed by empirical evidence (Abonyi, 2002). This lack of evidence made Abonyi to venture into researches that will involve the use of the learners" cultural or local environment or practices in order to justify or falsify the claims.

Abonyi (2002) studied the effects of ethnoscience-based instructional package on students" attitude to science. The study was conducted in six secondary schools of Enugu state. Three of the schools were assigned to experimental group while the remaining three were assigned to control group. A total of 124 subjects (51 males and 73 females) made up the sample for the study. The study was specifically geared towards answering the questions of whether ethnoscience instructional package has effect on students" interest to science as well as their (students") gender. The experimental group was taught Basic Science using the ethnoscience-based instructional package while the control group was taught using the lecture method. The instrument used was the Bagley's Interest in Science Scale (ISC). The study concluded that ethnoscience instructional package is effective in improving students" attitude to science and is gender friendly.

Peni (2011) investigated the impact of ethnoscience-enriched instruction on attitude, performance and retention of basic science concepts among rural and urban students in Kano state. The study employs a pretest-posttest-quasi experimental control group design. 213 JSS 11 students were used as sample of the study. The instrument used for data collection was Basic Science Performance Test(BSPT) and Students Attitude to Basic Science Questionnaire (SABSQ).The research subjects were assigned into experimental

and control groups with each group consisting of Urban (male) and urban (female) as well as Rural (male) and Rural (female) sub groups respectively. Experimental group was subjected to six weeks teaching of Basic science concepts using ethnoscience-enriched instructional strategy while the Control group was taught using traditional (lecture) method. The results of the study showed that students in the experimental group performed significantly higher than the students in the control group, in the same vein, it shows that ethnoscience–enriched instruction is gender-free, that means the academic performance of both male and female students were enhanced using this instruction strategy. The result of the study further shows that students in the experimental group exhibit better retention of learnt concept than students in the control group. Therefore, in essence, this will not only validate the earlier findings but will also provide a wider scope of empirical literature that shows the effectiveness of ethnoscience instructional strategy in enhancing students‟ academic performance and retention of learnt concepts. Albert (1975) studied the effect of ethnoscience on American Indian student. Albert on his study determined whether the use of ethnoscience in science concept development would increase the academic achievement of Navajo students at the Many Farms high school in Many Farms, Arizona. The major hypothesis of the study was that the mean of the academic achievement of Navajo students in ethnoscience treatments as measured by teacher-constructed examinations was greater than the mean of the science treatments as measured by teacher constructed examinations. Six conservation units utilized in the many Farms High School Biology programme were selected to test the effectiveness of the ethnoscience exemplars. The sample of Navajo high school students used in the study was selected in a non-bias manner and placed into six Biology classes. Two teachers were involved in the planning, test construction and implementation of the study. After each unit was presented, a short multiple choice examination was administered and the test data collected. The teachers themselves were evaluated to determine teaching methodology with a scale that indicated expository to discovery characteristics. Both teachers scored essentially the same and approximately midway between the extremes. An attitude survey relating to the students attitude toward science was administered at the close of the study. This survey was given to determine if ethnoscience topics and material might have a negative effect on attitude. Result of the survey indicated an overall positive attitude toward science. The statistical processing of the data involved the use of repeated measures design, two factors with the repetition of the ethno and non ethnoscience treatment only. The major hypothesis was not accepted at a 0.05 level of significance. In addition, six post hoc studies were made to test the ethnoscience effect for each unit. Only unit II conservation: water pollution I, proved to be significant at the 0.05 level. The unit also utilized the greater number of ethno-examplers; this implied that the effectiveness of ethnoscience-enriched instruction was related to the number and type of ethno-examplers used during the instruction.

Abonyi (1999) studied the effect of ethnoscience based instructional model on students' conception of scientific phenomena and interest in science (integrated science). The study which was conducted in Nsukka Education Zone of Enugu State illustrates how ethnoscience based model may influence the utilization of indigenous understanding of the scientific concept theories and paradigms in teaching and learning new scientific concepts. The study employed a non-equivalent control group quasi-experimental design. The sample for the study comprised of 243 JSIII students drawn from six secondary schools within the Nsukka education Zone of Enugu State. Out of the six secondary schools, three (one male, one female and one coeducational) were assigned to the treatment group while the remaining three were assigned to the control group. The treatment group was taught science using the conventional model. Data on conception and interest were collected using a conception of scientific phenomena were analyzed qualitatively using categorizing and typologies while data on interest in science were analyzed quantitatively using mean, standard deviation and analysis of covariance. The study revealed that ethnoscience-based model is superior to the conventional model (lecture method) in fostering interest in science and also is ensuring conceptual understanding of new scientific ideas.

Conclusion

As established earlier in this paper, ethnoscience –enriched teaching strategy as an innovative teaching strategy employ the use of learners cultural background and environment in teaching new scientific knowledge to the learner ,it make use of learners previous experiences and knowledge derive from his/her environment to facilitate proper understanding of scientific phenomena being thought, it was based on the Ausubel theory of meaningful learning, which stressed the importance of learner's previous knowledge and experiences during learning process ,it is a learner-centered approach and empirical studies conducted by various researchers shown that students thought using ethnoscience-enriched instructional strategy have higher academic performance and better retention of learnt scientific concepts than their counterparts thought the same concepts using conventional lecture method. Therefore, ethnoscience-enriched instructional strategy should be employed by science teachers in their teaching activity so as to reduce the persistent failure in sciences being recorded by our students in public examinations.

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