Full Length Research Paper

Conflicts in science the classroom: Documentation and management through phenomenological methodology

K. O. Oloruntegbe[1], A. O. Omoniyi[2], M. B. I. Omoniyi[3] and I. A. Ojelade[2]

[1]Science and Technical Education Department, Adekunle Ajasin University, P. M. B 001 Akungba Akoko,
Ondo State, Nigeria.
[2]Science Education Department, University of Abuja, Gwagwalada, Federal Capital Territory, Abuja, Nigeria.
[3]Counseling Education Department, Adekunle Ajasin University, Akungba-Akoko, Nigeria.

The study investigated the nature of conflicts that are generated in the science classroom. Twenty video-recorded lessons taught by 10 randomly selected pre-service science teachers in teaching practice in a few Nigerian secondary schools were analyzed. Beside the expected goal attainment of the lessons a number of negative conflicts were documented. The analysis of the responses to the questionnaire administered to further sample of 220 serving science teachers presented in charts not only confirmed the occurrences of these negative instances but attributed them to students' poor home background and upbringing, They attributed students' success and good performance to teachers' dedication and employment of good teaching methods, strategies and approaches. The subjects played down the contributions from government and parents. A number of remediation strategies meant to carry all students along in teaching-learning situation were made. These include adequately equipped laboratories, provision of appropriate incentive environment for teachers, retraining and counseling. The author sees these useful but predictable findings as part of a customary teacher's narrative and rhetoric. For that reason, this study sought to adopt a phenomenological methodology by reconstituting these surface experiences afresh and at deep level perceptions. One suggestion is science excursions for students who for one reason or the other are prone to causing these conflicts. Such excursions can take the students to a science museum or science exhibition that offers hands-on involvement and can help change their attitudes towards learning science inside the more passive space of the classroom.

Keywords: Science classroom, nature of conflicts, classroom management, phenomenological methodology.

INTRODUCTION

Interaction in the science classroom has always been a triple dynamics between the teacher, the learner and the learning materials (Adigwe, 2004; Anderson, 1982; Utulu, 2005; Awotua-Etebo, 1999). The three variables are expected to interact harmoniously in a way to produce the intended learning outcomes. Issues of how to get students to concentrate, to invest more efforts and to take academic work more seriously are challenges teachers have to contend with everywhere. Students' engagement in academic work, students' characteristics, teachers'

characteristics and availability of learning materials, instructional strategies and assessment procedures are parameters that often attract the attention of researchers. There is also the tacit assumption that classroom environment that promotes cooperation and healthy competition engenders better performance. Many educators are of the opinion that conflicts and controversies are bad, that they produce negative results and nothing else. Consequently, the common wisdom suggests they should be eliminated from the established framework of institutions of learning. The author thinks that our classrooms are alive with issues and controversies where an exploratory study could make a positive contribution to knowledge, curriculum development

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*Corresponding author. E-mail: ko_oloruntegbe@yahoo.com.

and curriculum implementation at the classroom level.

The present study conducted in science classrooms in Nigeria investigated the type of conflicts and controversies that were generated in addition to the normal positive achievement of lesson objectives. The frequency at which they occur and the teaching-learning variables to which teachers attribute these conflicts and controversies to were investigated. It also looked at preferred remediation strategies for curbing negative conflicts. One of such is the adoption and application of phenomenological methodology.

LITERATURE REVIEW

Phenomenology is a branch of philosophy owing its origin to the work of Husserl (Husserl, 1964, 1982) and later writers [e.g., Heidegger, Sartre, Merleau-Ponty, who took the ideas into existentialism]. The aim of phenomenology, as propounded by Husserl, is to study human phenomena without considering questions of their causes, their objective reality, or even their appearances. The aim is to study how human phenomena are experienced in consciousness, in cognitive and perceptual acts, as well as how they may be valued or appreciated aesthetically. Phenomenology seeks to understand how persons construct meaning and a key concept is intersubjectivity

The adoption of phenomenological methodology could be an eventual solution to teachers' formed opinions and perceived views of students' antithetical behaviour in the classroom. This stems from the emerging theory of bracketing and pragmatic conclusion-making (Schutz, 1962, 1967 and Husserl, 1964). The theory talks about bracketing or suspension of our everyday natural attitudes toward life experiences (Manen, 2002). Educationists have applied phenomenological methodology in discourse leading to innovative drives in the areas of curricular, classroom practices, assessment strategies and funding of education. This methodology was applied in this study as a way of shaping and shifting teachers' customary narrative and rhetorics towards innovative strategies of science delivery.

Science instruction is of particular relevance as a focus for looking at conflict and controversy in teaching environments, in part because of the very nature of the subject matter. From inception disagreement and controversy have been an integral part of scientific discourse and practice. Many discoveries of the past would have been shrouded in obscurity without the courage to engage in such controversy. For instance, the emergence of penicillium notatum in the bacteria cultured by Professor Alexander Fleming in 1929 was a kind of conflict leading to a positive contribution in the field of medicine. The controversies that attended the development of modern chemistry and the various conflicting positions of Dalton, Thompson, Rutherford and others provided a tremendous stimulus to the development of modern atomic structure.

When a student stood up boldly and asked the teacher during a demonstration class. How do we control for the amount of stirring during this experiment? (Ikeobi, 1997 at STAN Conference – Chemistry Panel Discussion). The experiment was about monitoring effect of concentration of solutions on the rate of chemical reaction using thiosulphate, hydrogen chloride acid and water. Chemistry textbook authors and teachers are familiar with the fact that one can fix the concentration of acid and vary that of thiosulphate by adding known volumes of water at interval and record the time. But no one ever thought that the extent of stirring or shaking of conical flask containing the reacting solutions can introduce a variable that could affect the result of the experiment. The teacher did not prepare for that. This is a kind of conflict that set the teacher and the panelists thinking of how much unexpected phenomena can invalidate well thought-out experiments and ideas.

Conflicts had been known to generate useful changes even in social and political parlance. However, to many nations, especially in the developing world, internal disagreement, dissensions, and conflicts are viewed as inherently antithetical to the smooth functioning of the society. Happy cooperation and consensus are the normal and cherished ways of life even when economic and political systems are in a shamble.

Educational systems likewise traditionally incorporated a high degree of discipline and authoritarian control of pupils, particularly in certain specific teaching cultures like that of Africa. Pupils in many Nigerian classrooms are forced to conform to the teachers' or schools' set standards. It is a common occurrence to hear teachers order pupils. "All of you sleep and rest your heads on the table", "All of you take out your note and write after me", "All of you sit down and keep quiet". Even at home there is an insistence on almost unquestioning obedience to authorities (religious, social and political). Children in traditional African homes are not permitted to make contributions when adults are discussing certain matters. African child rearing practices in traditional societies have tended to inculcate obedience in to authority and avoidance in challenging it. The question of congruence and incongruence of some traditional values with those taught in schools is raised in Mwamwenda (1996), Okonji and Mundy-Castle (1981): (Mother-infant Interaction in Nigeria. Department of Psychology, University of Lagos, unpublished), and argued that this kind of conformity inhibit intellectual development. The shout of joy "Eureka" meaning "I have found it" or "I have discovered it" and such other positive adventures are a rare occurrence in many science classrooms. Instead, the reality tends to reflect the frustration and boredom that permeate much traditional instructions in West African. Apple (1973) commenting on hidden curriculum and the nature of conflicts noted that "by the fact that scientific

consensus is continually exhibited, students are not permitted to see that without disagreement and controversy science would not progress or would progress at a much slower rate" Not only does controversy stimulate discovery by drawing the attention of scientists to critical problems, but it serves to clarify conflicting intellectual positions. It would thus seem necessary to plan strategies for managing controversies and conflicts in the science classrooms.

Conflicts in the classroom are caused not only because of the tendency of teacher wanting to exercise classroom power but often occur when students are disconnected socially and academically. Such behaviour include social withdrawal, recurrent or graphic themes of violence in writing and drawing, intolerance and prejudice in either actions or writing, chronically being picked on, bullying others and gang involvement (Mendler, 2001). Strategies geared towards helping students to overcome this behaviour and concentrate on learning could be developed by teachers through restructuring and a supportive teacher-student relationship. Hughes and Cavell (2007) shows that a warm close relationship between children at risk for behavioural problem and their teacher reduces the chances of aggressive behaviour in the future. Yet current conflicts prevention efforts, according to Hughes and Cavell (2007) tend to focus only on discipline techniques, classroom management or children's social skills. Teacher-student relationships are not deemed important within this mix. From their study, there emerged the evidence that quality of student-teacher relationships can predict aggressive classroom behaviour. In other words, positive student-teacher relationships in one year were followed by lower levels aggression the next.

Students contribute substantially to classroom order by either cooperating or resisting. They (students) influence classroom events as much as they are affected by such events. Students are also observed to cling to their value orientation, set rules for social relationship, make decisions to preserve their ethnic integrity, create spaces for resistance, and forge bonds for solidarity within the structure of schooling (Sheets 1996)   Consequently, classroom practices and school policies of regimentation designed to homogenize diverse students populations into "well behaved" group may advertently cause behavioural conflicts. This suggests reasons why due attention should be paid to individual students' behavioural problems and conflict issues beyond ordinary classroom rules and regulation and look on to contributing disciplines like philosophy of phenomenology. Phenomenological methodology as discussed earlier will help educators look at these conflicts beyond surface level and perception, and constitute them afresh and search for ways of bringing out positive meaning from them. This is the area of focus of this paper, which documents conflicts generated in Nigerian science classroom and suggest ways of managing them.

Statement of the problem

Looking and observing what goes on in our classrooms, one would be fascinated about issues that occur outside planned and intended learning outcomes. (The case of the student mentioned in the introduction is an example.) These issues could be positive or negative. We may not be able to run way from them. This is in spite of Tyler's suggestion or insistence on "objective-oriented" model or "ends and means" affair (Tyler, 1949), that once learning objectives are formulated, a high degree of achievement must be targeted at. What happens to incidental and unplanned interjections and events that often emanate in the classrooms? Do we count them off as one of students' antics that require no attention from the teachers? How do we manage them even when they look negative so we can bring something positive out of them? Can we adopt phenomenological inquiry as a way of solving these problems? These, simply stated, are the problems of this study. The purpose, therefore, is to document these issues and conflicts, noting the frequency of their occurrences and managing them by adopting phenomenological methodology of bracketing and pragmatic conclusion-making.

Research questions

The following research questions were addressed in this study: What conflicts and controversies are generated in addition to learning taking place in Nigerian science classrooms? To what teaching-learning variables, 'teacher-related', 'government-related' and 'parents-related' do teachers attribute them? What remediation strategies are offered for curbing negative conflicts?

METHODOLOGY

Sample and sampling procedure

There were two groups of subjects for this study. One group was made up of 15 pre-service chemistry education undergraduate students/teachers of the Science and Technical Education Department of Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria that participated in 2007/2008 and 2008/2009 Teaching Practice Exercises mounted in the Faculty of Education. The other group consisted of 220 serving science teachers. They also were an intact sample of teachers that participated in Science Teachers Association of Nigeria (STAN) 2009 National Biology, Chemistry, Physics and Integrated Science Panel Workshops held the same year. The participants came from 36 states of Nigeria. The researcher employed purposive sampling technique by making use of the all the available third year chemistry education undergraduate students, 15 in number, in Science and Technical Education Department in 2007/2008 session and the same group at their final year in 2008/2009 session. This group of students, the pre-service teachers or student teachers (as they are popularly called) in teaching practice were suitable as a sample for this study because they could pay detailed and better attention to events in

the classroom as part of the training exercise inculcated. They were asked to document events taking place in the classroom using a prepared proforma. This is in addition to video-recording of 20 lessons delivered by a randomly selected 10 of the 15. The second group, the serving teachers by experience would be able to confirm or disagree with the discovery of their pre-service counterparts. They were to do this by filling questionnaire which also demanded that they suggest remediation strategies.

Instrument

There were three types of instruments. Observation through video-recorded lessons was analyzed using a proforma. The same proforma designed to document, lesson by lesson, what issues and controversies occur in science classrooms was given to the 15 pre-service science teachers using who were taught to watch out for unusual events that could lead to achievement or non-achievement of instructional objectives stated for the lessons, and document the same. The other instrument was a follow-up one, a questionnaire consisting of four parts was administered to the 220 serving science teachers. Part A solicited for personal data. Part B was constructed to elicit responses on how often the conflicts earlier documented by pre-service science teachers occur in their classrooms. Responses were ticked under four point Likert scale of very often, sometimes, rare and seldom. The scale was later collapsed into often and rare for easy and meaningful analysis. In part C, teachers-learning variables such as teachers-related, government-related and parents-related factors are listed for ranking as the causes(s) of the conflicts as well as successes of lessons taught. The remaining part solicited suggestions for remediation.

Validation of instrument

 A 'panel of experts' technique (Coll et al, 2002; Germann, 1988; and Krynowsky, 1988) was employed in establishing the content and construct validity. This involved subjecting the instrument to analysis by experts, two academics, in the field that the instrument examines – chemistr and two in tests and measurement. The content validity is to ensure that both instruments measure the content of study They made useful suggestions which the authors used in preparing the final draft. The reliability of the instrument was determined through a test-retest method by administering the instruments to pre-service and serving science teachers outside the sampled subjects but within the population and areas two times at three weeks interval. The coefficients of reliability were put at 0.76 and 0.81 respectively for the two instruments. Experts in measurement (Kaplan, 2001; Nunnelly, 1978) agree that the values were good enough for research purposes.

Data collection and data analysis

Copies of the proforma were given to the student teachers as they proceeded to the teaching practice. They were properly briefed on what to do. The investigator made the video-recording of sampled lessons himself. The questionnaire was self administered to the participants at the workshops. Responses were analyzed by using simple frequency count, percentage and presentation in charts.

RESULTS

The results were presented in answers to research questions that were raised.

Research Question 1

What conflicts and controversies are generated in addition to lesson objectives in Nigerian science classroom?
    Some of the conflicts documented from the 20 recorded lessons taught by pre-service teachers are listed thus:

1) Students causing distraction in the class while others are paying attention to lessons;
2) A few of them seem not to be ready for the lessons;
3) Late coming to the lessons; and
4) Unwillingness to perform a given task were some of the negative behavior noticed and documented.

In all there are 15 of such negative conflicts documented. Causing distraction include students stretching abnormally, making noise, applying lipstick or powder, going out of class without permission, abusing other students and other similar issues. Students were not just ready to learn when they showed lack of interest e.g. fiddling with mobile phones or engaging in activities like reading and writing that have no bearing with the work at hand.

Research Question 2

To what teaching-learning variables, teacher-related, government-related and parents-related, do teachers attribute these conflicts and controversies as well as successes in lessons?
    The responses of 220 serving science teachers were analyzed under related teaching-learning variables they attributed the conflicts and successes to and presented in bar chart. The teaching-learning variables were designated as Teachers-related, Government-related and Parents-related. Government-related factor has to with non-availability of teaching and learning facilities and inadequate funding.
    From Figure 1, the teachers attributed reasons for negative instances in student more to parents and government. In other words the teachers blamed the parents (poor home upbringing) and government (not provision of necessary facilities) more for students' misbehavior. They attributed to themselves only few factors like asking students to copy notes during the lesson as sign of poor method of teaching. On the other hand, information on Figure 2 reveals that the teachers attributed students' good behavior and good performance to teachers' dedication to work.

Research Question 3

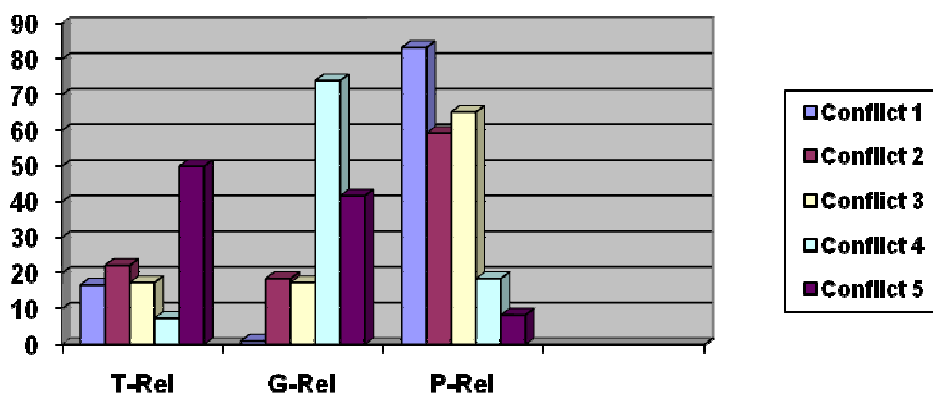What remediation strategies are offered for curbing negative conflicts?

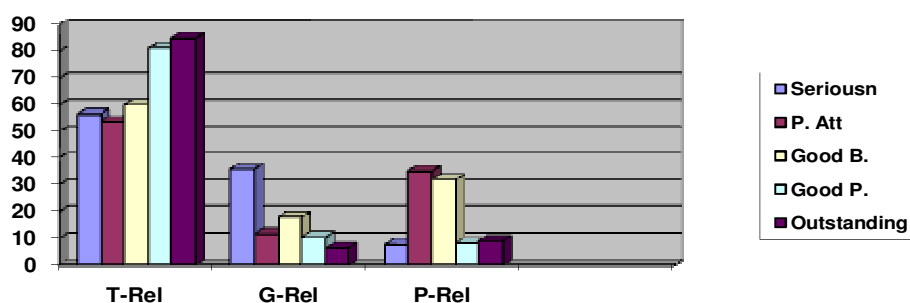**Figure 1.** Teachers rating of factors of negative conflicts in students

Figure 2. Teachers rating of factors of positive instances of students

The remediation strategies offered by the 220 respondents include the followings:

1) Lessons to be made more interesting by adopting right method of teaching
2) Leaning materials to be made available
3) Teachers to be encouraged by giving incentives
4) Teacher to be retrained through sponsorship to seminars, workshops and conferences.
5) Proper counseling of students on good behavior at home and at school.
6) Parents to support teachers in disciplining students and help students at home.
7) Teachers to be more dedicated and act as models for the students
8) Teach science subjects in the morning when the brain is fresh.

There are other suggestions that can be grouped under those that has been listed.

DISCUSSION

That negative conflicts were prevalent in 20 recorded lessons taught by the pre-service science teachers is an indication that all is not well with what goes on in our science classrooms. The serving science teachers not only confirmed the prevalence of these negative conflicts, they attributed their occurrence mostly to students' home background. This explained why parents-related factors have highest frequency – highest trough in the bar chart. Even cases such as students walking out of classroom during a lesson, refusal to write teachers' given notes when writing materials are available, loss of interest in class work and inattention were attributed to students' poor upbringing. That is the homes where the students came from might not be supportive enough in helping their (students') academic work. This could mean that the parents were not able to meet the psychological, physiological as well as academic needs of the students before they leave homes for schools. The observations

made above are in line with those Wolfram (2005) and Tenenbaum and Leaper (2003) that students' parental home background correlates highly with their (children's) behaviour in school.

Perhaps if the parents were to do the same, they would rank teachers as the greatest cause of students' poor performance and misbehavior. Figure 2 is revealing as well teachers attributed positive instances to their dedication to work and the employment of good methods and approaches in science teaching. Good home background of students came at distant third. That good teaching method tops the list of the remediation strategies suggested is a pointer that the teachers acknowledged such factor as essentially indispensable in promoting students' science learning and enhancing their performance.

Intervention through phenomenological methodology

The author earlier suggested the adoption of phenomenological methodology in resolving issues and conflicts bothering on classroom misbehaviour of students.

As stated in the review, phenomenological methodology has been applied in school policies, curriculum reform, classroom practices, assessment strategies, and even funding (Byrne, 2001; Gendlin, 1997; Ricoeur, 1991b; Wilson, 2002). Investigations into various human endearvor have received the attention of phenomenological researchers in recent years The remediation strategies suggested by the respondents in this study are useful; they could go a long way to shape the classroom practice. However, these could be considered as customary teachers' narrative and rhetoric because blame has been and will ever continue to be placed and suggestion offered. If the situation does not change as the case is with many nations (Holmes, 2006; Lee and Fraser, 2001; Sijuade, 2001), there is, therefore, the need for "bracketing'. That is to go beyond these surface experiences and constitute new meaning for these negative conflicts and the suggested remediation strategies.

In this regard the author is suggesting the creation of "scientific distraction, scientific inquiry, scientific walk/excursion" in the classrooms, schools and communities where, for one reason or the other, students are prone to negative conflicts. The onus still rests on the teachers who would have to mobilize the science students for such activities on a regular basis, thus enhancing their impacts in the school community.

For example, the scientific walk/excursion could take students to science museums, hands-on science exhibition centers. Braund and Reiss (2006) posited that communicating science out-of-school can be exciting, challenging and uplifting, and can make a science curriculum more authentic. Scientific distractions can be created in the school community, for example, by making

a little quantity of paint to paint a small portion of the administrative block in need of a fresh paint one week. This can include dyes and indicators from flowers and leaves to be exhibited on the assembly ground some other week. The students can be made to think and plan ahead what to do in some practical project that illustrates chemical reactions etc. By so doing, the school authority will be interested and ready to assist. The parents may as well, when they see or hear what their children are doing in the school, do something. The teacher will have no option but to sit up. There will be no forcing of students to copy notes they do not understand because they will discover science concepts and principles themselves and get interested once more in science course. They would also acquire skills and appropriate scientific attitudes in the process. In the final analysis, "eureka", the shout of joy of discovery that has for a long time been missing in our science classroom may surface again.

CONCLUSION AND RECOMMENDATIONS

In this study, it has been revealed that occurrences in the classroom usually go beyond what the teachers and the schools planned for. Some of these are negative. They were documented and reported here along with normal classroom expectations. At the surface, some of them look simple and trivial, but they go a long way to determine not only the level of classroom organization and students' performance but also the quality of science taught in the school. No school administrator would want to condone disorderliness and indiscipline in the school for whatever reasons. When these (indisciplines or students' misbehavior) happen, rather than trading blames, the author suggested "bracketing' and the adoption of phenomenological methodology as effective intervention strategy. There are many purposeful ways exemplified in this methodology by which the students can be engaged in and out of school to enhance their science learning, to create and sustain their interest and to develop in them saleable skills and good attitudes. These are recommended for teachers, school administrators and curriculum developers as ways of helping students to achieve the primary objectives of science teaching and learning and schooling generally.

REFERENCES

Apple M (1973). The hidden curriculum and the nature of conflicts. In Pinar, W. (ed), Curriculum Theorizing: The Reconceptualist; Berkeley, Mc Cutchan Publishing Co., pp. 35-51.

Adigwe JC (2004). School climate and chemistry classroom environment of senior secondary schools. Benin J. Educ. Stud., 18(2): 83-89.

Anderson C (1982). The search for school climate: Review of research. Rev. Educ. Res., 52: 365-420.

Awotua-Efebo EB (1999). Effective Teaching: Principles and Practice. Nigeria, Port Harcourt, Paragraphics, pp. 105–157.

Braund M, Reiss M (2006). Towards a more authentic curriculum: The contribution of out-of-school learning. Int. J. Sci. Educ., 28(12): 1373–1388.

Byrne MM (2001). Understanding life experiences through a phenomenological approach to research. AORN J., 73: 830-832.

Gendlin E (1997). Experiencing and the Creation of Meaning: A Philosophical and Psychological Approach to the Subjective. Evanston: Northwestern University Press, pp. 45-60.

Husserl E (1964b). The Phenomenology of Internal Time Consciousness. J. S. Churchill, Translated Edition. Bloomington, IN: Indiana University Press.

Husserl E (1982). Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy. Second Book, The Hague, Nijhoff, Kluwer Academics Publishers.

Hughes JN, Cavell TA (2007). http//www.familycorner.com/education/teacher-student relationship.shtml.

Manen M (2002). Phenomenological Inquiry. Phenomenological Online: Methodology. http://www.phenomenologyonline.com.

Mendler AN (2001). Connecting with Students. Association for Supervision and Curriculum Development, USA, Alexandria, VA, pp. 23-41.

Mwamwenda TS (1996). Educational Psychology: An African Perspective. Butterworrth; Heinemann.

Ricoeur P (1991). From Text to Action: Essays in Hermeneutics. Evanston II: Northwestern University Press, Volume 1.

Sheets RH (1996). Urban Classroom Conflicts: Student-Teacher Perception: Ethnic Integrity, Solidarity, and Resistance. The Urb. Rev., 28: 27.

Schultz A (1962). The problem of Social Reality. The Hague; Netherland, Nijhoff., Collected Paper, 1: 20-34.

Schultz A (1964). The Stranger: An Essay in Social Psychology. Collected Paper , Studies in Social Theory. Ths Hague, Martinus, Nijhoff, II: 93.

Tennbaum HR, Leaper C (2003) Parent-child conservations about science: The socialization of gender in equities. Dev. Psychol., 39(1): 34-47.

Tyler RW (1949). Basic Principle of Curriculum and Instruction. USA: University of Chicago Press, pp. 12-15.

Utulu R (2005). The Influence of Classroom Environment in Learning and Behavior of Nursery School Children. In B.O.Kerr, N.A.Ada. and P. Oriese (eds) New trends in Education; Issues and Challeges; Nigeria, Gboko; Peach Global Publication, pp. 85-94.

Wilson TD (2002). Phenomenology and Research Methodology for Information Behaviour Research. A Paper Delivered at ISICA-Fourth International Conference on Information Seeking in Context., Universidade Lusiada, Lisbon, Portugal, September 11 to 13, 2002..

Wolfram S (2005). Measuring Socio Economic Background of Students and its Effect on Achievement on PISA 2000 and PISA 2003. Being a paper prepared and presented during the Annual Meeting of the Americans Educational Research Association (San Francisco, CA. April 7-11).