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Full Length Research Paper

Effect of constructivist-based teaching strategy on academic performance of students in integrated science at the junior secondary school level

Oludipe Bimbola¹ and Oludipe I. Daniel^{2*}

¹Department of Curriculum Studies and Instructional Technology Olabisi Onabanjo University, Ago-Iwoye, Nigeria.

²Biological Sciences Department, College of Science and Information Technology, Tai Solarin University of Education, Ijebu-Ode, Ogun State, Nigeria.

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Integrated science plays vital role in Nigerian science education programme because it prepares pupils at the Junior Secondary School level for the study of core science subjects at the Senior Secondary School level which in turn brings about students' interest in science oriented courses at the tertiary institutions. Despite government's efforts to encourage science teaching and learning among Nigerian students right from the Junior Secondary School level, the enrolment of students in core science subjects and science oriented courses at the Senior Secondary School level and tertiary institutions level respectively, is not encouraging. This is as a result of Junior Secondary School students' negative attitude towards integrated science. Research reports indicate that this negative attitude was caused, majorly, by teachers' conventional (lecture) method of teaching integrated science. Research reports on the effectiveness of constructivist-based teaching strategy revealed that the strategy enhanced students' academic performance. In view of this, this study examines the effectiveness of constructivist-based teaching strategy on academic performance in integrated science by Junior Secondary School students in South-West Nigeria. Quasi-experimental research design was used to achieve the purpose of this study. Participants were 120 Junior Secondary School Students randomly selected from four out of the 25 co-educational Junior Secondary Schools in Ijebu-ode local government area of ogun state, South-west Nigeria. Findings revealed that the constructivist instructed students had higher scores on the post test and the delayed post test, compared to those exposed to conventional (lecture) method of teaching. We concluded that if integrated science teachers could incorporate constructivist-based teaching strategy into their teaching methods, there would be an improvement in academic performance of Junior Secondary School Students in integrated science. The researchers recommended that integrated science teachers should incorporate constructivist-based teaching strategy in their methods of teaching.

Key words: Nigeria, constructivism, conventional (lecture), integrated science, academic performance, junior secondary school III students.

INTRODUCTION

Critics of public education have argued that many Nigerian students do not possess the depth of knowledge or skills to assure either personal life success or national economic competitiveness (Akpan, 1996). A particular

concern of the critics has been the apparent inability of many students to engage in complex problem-solving activities and to apply school knowledge and skills to real-life problems in workplace settings (Akpan, 1996). What teachers and schools face is a fundamental redefinition of what it means to be a student or a teacher and what it means to learn or to teach. Educators are confronted with a paradigm shift in teaching and learning

*Corresponding author. E-mail: daniel.oludipe@gmail.com.

which is driven by the increasing anomalies of the current educational system (Kim, 2002). High drop-out rates, low skill and knowledge levels among many students, low levels of student engagement in school work and poor international comparisons suggest that the current educational paradigm is weak or inappropriate.

Educators must understand that changes in students' outcomes must be supported by parallel changes in curriculum and instruction. However, it is apparent that many of today's teachers are caught in the midst of a change for which they may not have been professionally prepared (Dogru and Kalender, 2007). Many teachers were educated in the classrooms where the role of the student was to memorize information, conduct well-regulated experiments, perform mathematical calculations using a specific algorithm and were then tested on their ability to repeat these tasks or remember specific facts. The ideas which are central to an education which defines competence as the ability of the student to apply knowledge and skills to unfamiliar problems are not new. These ideas were found in traditional apprenticeship programs, where daughters and sons learned life sustaining skills from parents and they were central to the successes of all traditional peoples. Theorists in cognition, curriculum and instruction (e.g. Di Vesta, Vgotsky, Von Glaserfeld, etc.) are now providing the underlying rationale and language for discussing this fundamental change in teaching and learning which is at the heart of the current school improvement agenda. Constructivist theory provides a framework through which the emergent ideas about teaching, learning and assessment can be unified (Young and Collin, 2003). The difficulty and challenge confronting classroom professionals is that the reform strategies in curriculum, instruction and assessment organized around the theory of "constructivism" are informed by different assumptions and beliefs about the nature of knowledge and about the human capacity to learn than are traditional classroom practices (Kim, 2005).

Additionally, the conventional (lecture) teaching method of teacher as sole information-giver to passive students appears outdated. In a study carried out by (Colburn, 2000) on undergraduates in a large lecture hall setting, it was found that only 20% of the students retained what the instructor discussed after the lecture. They were too busy taking notes to internalize the information. Also, after a lecture has passed eight minutes, only 15% of the students are paying attention. Furthermore, the present curricula in integrated science are overstuffed and undernourished (Olawaju, 1987). The integrated science curricula emphasize the learning of answers more than the exploration of questions, memory at the expense of critical thought, bits and pieces of information instead of understanding in context, recitation over argument, reading in lieu of doing. The curricula also fail to encourage students to work together, to share ideas and information freely with each other, or to use modern instruments to

extend their intellectual capabilities (Olawaju, 1987).

One proposed solution to the afore mentioned problem is to prepare students to become good adaptive learners. That is, students should be able to apply what they learn in school to the various and unpredictable situations that they might encounter in the course of their work lives. Obviously, the traditional teacher as information giver and textbook guided classroom has failed to bring about the desired outcome of producing thinking students (Young and Collin, 2003). A much heralded alternative is to change the focus of the classroom from teacher dominated to student-centered using a constructivist approach.

The aim of the present study was to determine the effects of constructivist-based teaching strategy on students' understanding of Integrated Science concepts by Nigerian Junior Secondary School students instructed using constructivist instruction (with co-operative learning approach). To accomplish the afore-mentioned purpose, the following objective was established: Compare students' academic performance of the constructivist approach in Nigeria integrated science education with the students in conventional (lecture) instructional approach.

THEORETICAL FRAMEWORK

Constructivism is a psychological theory of knowledge which argues that humans construct knowledge and meaning from their experiences. Constructivism is a set of beliefs about knowledge that begins with the assumption that reality exists but cannot be known as a set of truth (Tobin et al., 1993). Constructivism is not accepting what you are told but your prior knowledge about what you are taught and your perceptions about it. Active involvement of students is emphasized in constructivism, hence knowledge gained last long in their memory. Constructivism is not a new concept. It has its roots in philosophy and has been applied to sociology and anthropology, as well as cognitive psychology and education. Perhaps the first constructivist philosopher, Giambattista Vico, commented in a treatise in 1710 that "one only knows something if one can explain it" (Yeager, 1991). Immanuel Kant further elaborated this idea by asserting that human beings are not passive recipients of information. Learners actively take knowledge, connect it to previously assimilated knowledge and make it theirs by constructing their own interpretation (Cheek, 1992).

Five basic themes pervade the diversity of theories expressing constructivism. These themes are (1) active agency, (2) order, (3) self, (4) social-symbolic relatedness, and (5) lifespan development. With different language and terminological preferences, constructivists have proposed, first, that human experiencing involves continuous active agency. This distinguishes constructivism from forms of determinism that cast humans as passive pawns in the play of larger forces. Second comes

the contention that much human activity is devoted to ordering process – the organizational patterning of experience by means of tacit, emotional meaning-making processes. In a third common contention, constructivists argue that the organization of personal activity is fundamental self-referent or recursive. This makes the body a fulcrum of experiencing and it honors a deep phenomenological sense of selfhood or personal identity. But the self is not an isolated island of Cartesian mentation. Persons exist and grow in living webs of relationships.

The fourth common theme of constructivism is that individuals cannot be understood apart from their organic embeddedness in social and symbolic systems. Finally, all of this active, meaningful and socially-embedded self organization reflects an ongoing developmental flow in which dynamic dialectical tensions are essential. Order and disorder co-exist in lifelong quests for a dynamic balance that is never quite achieved. The existential tone here is unmistakable. Together, then, these five themes convey a constructive view of human experience as one that emphasizes meaningful action by a developing self in complex and unfolding relationships. Focusing on a more educational description of constructivism, meaning is intimately connected with experience (Mahoney, 2004). According to Mahoney, students come into a classroom with their own experiences and a cognitive structure based on those experiences. These preconceived structures are valid, invalid or incomplete. The learner will reformulate his/her existing structures only if new information or experiences are connected to knowledge already in memory. Inferences, elaborations and relationships between old perceptions and new ideas must be personally drawn by the student in order for the new idea to become an integrated, useful part of his/her memory. Memorized facts or information that has not been connected with the learner's prior experiences will be quickly forgotten. In short, the learner must actively construct new information onto his/her existing mental framework for meaningful learning to occur.

Conventional (lecture) method of teaching is the process of transmission of knowledge from teacher to student (Rhodes and Bellamy, 1999). It is essentially a one-way process. The current Nigerian classroom, whether primary, secondary or tertiary institutions level, tends to resemble a one-person show with a captive but often comatose audience. Classes are usually driven by "teacher-talk" and depend heavily on textbooks for the structure of the course. There is the idea that there is a fixed world of knowledge that the student must come to know. Information is divided into parts and built into a whole concept. Teachers serve as pipelines and seek to transfer their thoughts and meanings to the passive students. There is little room for student-initiated questions, independent thought or interaction between students. The goal of the learner is to regurgitate the accepted explanation or methodology expostulated by

the teacher (Caprico, 1994). This teaching method can hinder the development of individual student's active and creative abilities, and students who experience only this model of education may no longer be considered sufficient for the needs of a future educated citizenry (Zhao, 2003).

In a constructivist setting, knowledge is not objective, mathematics and science are viewed as systems with models that describe how the world might be rather than how it is. These models derive their validity not from their accuracy in describing the real world, but from the accuracy of any predictions which might be based on them (Postlewaite, 1993). The role of the teacher is to organize information around conceptual clusters of problems, questions and discrepant situations in order to engage the student's interest. Teachers assist the students in developing new insights and connecting them with their previous learning. Ideas are presented holistically as broad concepts and then broken down into parts. The activities are student-centered and students are encouraged to ask their own questions, carry out their own experiments, make their own analogies and come to their own conclusions.

Cognitive theorists believe the role of the teacher is to provide learners with opportunities and incentives to learn, holding that among other things:

1. All learning, except for simple rote memorization, requires the learners to actively construct meaning
2. Students' prior understandings and thoughts about a topic or concept before instruction exert a tremendous influence on what they learn during instruction
3. The teacher's primary goal is to generate a change in the learner's cognitive structure or way of viewing and organizing the world and
4. Learning in co-operation with others is an important source of motivation, support, modeling, and coaching (Feden, 1995).

The constructivist theory of learning supports cognitive pedagogy, for opposing that humans have an innate sense of the world and this domain allows them to move from passive observers to active learners. Carlson (2003) supports a strong emphasis on identifying, building upon and modifying the existing knowledge (prior knowledge) students bring to the classroom, rather than assuming they will automatically absorb and believe what they read in the textbook and are told in the class. Research (e.g. Caprico, 1994) indicates that better exam grades were obtained by students taught using constructivist methodology. Supporting this finding, Saigo (1999), White (1999) concluded that "the constructivist model has been found to slightly influence students' achievement in a positive way". The constructivist model is capable of getting students more involved in learning. Kurt and Somchai (2004) in their own research study on constructivism also found that students used for their study participated more in the classroom activities and gained in content knowledge when a constructivist approach was

used. Brad (2000), in his study, found that students in the constructivist instruction showed higher degree of academic achievement than students in the traditional (lecture) instruction in all conditions. In a research study by Gatlin (1992) he found that there was no significant difference in students' scores at the posttest between students of the constructivist group and traditional (lecture) group. He reported that students' scores of those who received the constructivist approach showed a slight decrease on the delayed posttests, while students taught using the traditional (lecture) approach showed a greater decrease over time. Students who received the constructivist instructional approach have a higher relation over time. It can be said that students taught by traditional (lecture) means, who rely on memorization to pass tests, over time often do not remember much of the information learned.

Makanong (2000) corroborated Gatlin's finding in his research study when he found that there was no significant difference in achievement between students in constructivist group and traditional (lecture) group. Kurt and Somchai (2004) reported that there was no significant difference in achievement between Thailand students exposed to traditionalist (lecture) teaching method and constructivist teaching strategy in vocational electronics programmes. However, they concluded that the constructivist-instructed students had higher scores on the post test and the delayed post test, compared to those of the traditionally (lecture) instructed students. This implies that students in the constructivist's group retain the concepts taught better than their colleagues in the traditionalist's lecture group.

RESEARCH HYPOTHESIS

H₁: There is a significant difference in students' knowledge of integrated science concepts between Nigerian students who were instructed using constructivist instruction and conventional (lecture) instruction.

METHODOLOGY

Design and procedure

Quasi experimental research was used to achieve the purpose of this study. The study was conducted in four randomly selected public co-educational Junior Secondary Schools in Ijebu-ode local government area of Ogun state, South-west Nigeria. 120 Junior Secondary School (III) students participated in the study. In selecting the four schools, all the co-educational Junior Secondary Schools (J.S.S.) were assigned numbers which were written on pieces of paper. These papers were rolled and put into a container. One rolled paper was picked after mixing up the papers. The picked one was replaced before picking another one. This method of random sampling lead to selection of four schools (two for experimental group and the remaining two for control group). Intact class was used in each of the schools because most of the school principals did not want distortion in their normal school timetables. The intact classes in each of the schools were randomly selected from the arms of the J.S.S. III in the school.

Material used

The researchers and their assistants carried out the teaching of the students on each topic for three weeks respectively. The materials used were as follows:

1. A scheme of work consisting of selected integrated science topics (writing chemical equation, work and energy) which were taught for a period of three weeks. The students had not been exposed to these topics before the study.
2. An instructional package with the use of constructivist instruction.
3. An instructional package with the use of conventional (lecture) instruction.
4. A set of forty-five multiple-choice integrated science test items on topics covered.

The instrument in (d) above was used as pretest, post-test and delayed post test in order to evaluate students' performance. The test items were selected from the Junior Secondary School Certificate Examination (J.S.S.C.E.) past questions. The JSSCE questions are standardized in nature because the Questions were written by the experienced test and measurement experts in the ministry of education using an approved table of specification. Moderating Committee edited and selected good items. To confirm the reliability of the test items, the achievement test was administered to a set of JSS III students different from the ones selected for the study. Split-half method of estimating reliability was used to obtain a correlation co-efficient of 0.84.

Data analysis

Paired t-test and independent group t-test were used to analyze the data collected. The paired t-test was used to analyze the pretest-post test, pretest-delayed post test and post test-delayed posttest scores of the two groups; the independent t-test was used to compare performance of the two groups. Computation for the afore mentioned methods of data analysis was done using SPSS 13.00 package.

Procedure

Two intact classes in two of the four schools were designated 'constructivist learning environment (CLE)', while the remaining two intact classes in the other two schools were designated 'conventional lecture learning environment (CLLE)'. The pretest was administered to both groups. The test instrument covered the afore mentioned topics which were taught during the period of study. At the end of each of the three weeks, the same test was administered to both CLE and CLLE classes as a post-test. At each stage of post test administration, the items of the test were rearranged to give the impression that the pretest, post test and delayed post-test were different from one another. Two weeks after the administration of the post test, delayed posttest was administered to answer the question of whether there was student memorization of facts and information or whether understanding of the integrated science concepts taught by the teachers, using different instructional methods, affected retention.

RESULTS

Means and standard deviations for each method with respect to pretest, post test and delayed post test are presented in Table 1. As indicated in Table 1, students exposed to constructivist instruction in topic 1 had higher mean scores for both post test (31.95, SD = 2.4) and delayed post test (36.93, SD = 2.22). Also, in topic 2, students in

Table 1. Means and standard deviations of the sample's pretest, post test and delayed post test scores.

Tests	Method	N	Mean	Std. Deviation
Topic 1				
Pretest	constructivism	60	12.8667	2.1350
	Traditionalism	60	12.9500	2.2203
Posttest	constructivism	60	37.0000	3.0865
	Traditionalism	60	15.4000	1.9063
Delayed Posttest	constructivism	60	38.9833	1.7378
	Traditionalism	60	11.2333	1.3823

Std – Standard, N – Number.

Tests	Method	N	Mean	Std. Deviation
Topic 2				
Pretest	constructivism	60	14.5667	2.2801
	Traditionalism	60	12.5500	2.1267
Posttest	constructivism	60	31.9500	2.4036
	Traditionalism	60	15.1833	2.1193
Delayed Posttest	constructivism	60	36.9333	2.2160
	Traditionalism	60	12.8000	2.7047

Table 2. Summary table for the independent samples test on pretest, pos ttest and delayed-post test scores from groups 1 and 2.

t-test for equality of means			
Tests	t	df	Sig. (2-tailed)
Topic 1			
Pretest	5.010	118	.000
Post test	40.530	118	.000
Delayed posttest	53.463	118	.000
Topic 2			
Pretest	-210	118	.834
Posttest	46.122	118	.000
Delayed posttest	96.103	118	.000

Std -Standard, N - Number, df - degree of freedom.

constructivist group had the highest mean scores for both posttest (37, SD = 3.09) and delayed posttest (38.78, SD = 1.74). Generally, the lowest mean scores of all tests, except the pretest in topic 2, belonged to the students who were exposed to conventional lecture instruction (Table 1). Table 2 shows the t-test values for the pretest, post test and delayed post test with respect to the two

methods of teaching. At the pretest level, the exact probability level is .000 (topic 1) which is less than p ($p < .05$). This implies that there was significant difference in the mean score of students in constructivist group (14.57) and students in conventional lecture group (12.55). In topic 2, there was no significant difference in mean scores at pretest level between students in the constructivist group (12.87) and students in conventional lecture group (12.95). The p-value at this level is .834, which is greater than p ($p > .05$). At the post test level, the p-value is .000 (topics 1 and 2) which is less than p ($p < .05$). This implies that there was significant difference in mean scores at this level, for both topics 1 and 2, between students exposed to constructivist learning method (31.95 and 37) and students in conventional lecture group (15.18 and 15.40). At the delayed post test level, the p-value is also .000 (topics 1 and 2) which is less than p ($p < .05$). Hence, there was significant difference in mean scores, in both topics 1 and 2, between constructivist group students (36.93 and 38.73) and conventional lecture group students (11.23 and 12.80) (Table 2). Table 3 presents paired t-test for pretest-post test, pretest-delayed post test and posttest-delayed posttest with respect to the two instructional methods. In topics 1 and 2, the p-value for all pairings is .000, except the post test-delayed post test pairing which is .001. This implies that there was significant difference in the mean scores, at all levels of pairing, between students in constructivist group and students in conventional lecture group.

DISCUSSION

There was no statistical significant difference in the mean scores and standard deviation of the students in constructivist group (12.8667, 2.1350) and conventional lecture group (12.9500, 2.2203) in respect of topic 1, suggesting that the students had the same entry level before the treatment. Contrarily, there was a significant difference in the mean scores and standard deviation of the students in the constructivist group (14.5667, 2.2801) and conventional lecture group (12.5500, 2.1267) suggesting that the students had different entry level before the treatment. At the post test levels of topics 1 and 2, there was statistical significant difference in the mean scores and standard deviation of students in constructivist group (37.0000, 3.0865; 31.9500 and 2.4036) and conventional lecture group (15.4000, 1.9063; 15.1833 and 2.1193) suggesting that students in the constructivist group gained significantly after treatment compared to their colleagues in the conventional group whose mean scores was slightly different from their mean scores at the pretest levels. At the delayed post test levels of topics 1 and 2, there was statistical significant difference in the mean scores and standard deviation of students in constructivist group ((38.9833, 1.7378; 36.9333 and 2.2160) and conventional lecture group (11.2333,

Table 3. Paired samples test.

	Paired Differences			t	df	Sig. (2-tailed)
	Mean	Std Deviation	Std. Error Mean			
Topic 1						
Pair 1 pretest-posttest	-10.0083	7.7106	.7039	-14.219	119	.000
Pair 2 pretest delayed –posttest	-11.3083	11.3802	1.0389	-10.885	119	.000
Pair 3 posttest delayed –posttest	-1.3000	4.1294	.3770	-3.449	119	.001
Topic 2						
Pair 1 pretest-posttest	-13.2917	11.1645	1.0192	-13.042	119	.000
Pair 2 pretest delayed –posttest	-12.1000	14.0356	1.2813	-9.444	119	.000
Pair 3 posttest delayed -posttest	1.1917	3.4282	.3130	3.808	119	.000

1.3823, 12.8000 and 2.7047) implying that students in the constructivist group retained the facts and information on the integrated science concepts taught more than their colleagues in the conventional lecture group.

The results of the finding indicate that there was improvement in academic performance of students in constructivist group on pretest and delayed post test. Their scores in topics 1 and 2, at the post test level, were higher than their scores at the pretest levels compared to their colleagues in conventional lecture group. The same trend occurred at the delayed post test stage, students in constructivist group were able to retain 80% of the concepts taught compared to their colleagues in conventional lecture group who could only retain 10% of the concepts taught.

In view of the afore-mentioned findings, this study has been able to establish that the hypothesis is acceptable because there was a statistically significant difference for the samples' post tests and delayed post tests where the students who received the constructivist pedagogy scored higher than their colleagues in the conventional lecture group. The findings of this study are in line with the research findings of Saigo (1999); White (1999) and Brad (2000).

Consequently, if constructivist approaches to learning could be used by integrated science teachers in Nigerian Junior Secondary Schools, there will be improvement in academic performance of the Junior Secondary School students in integrated science, hence they will develop positive interest in the core science subjects at the Senior Secondary School level which will eventually to students' interest in science oriented courses at the tertiary education level. In view of this, integrated science teachers should incorporate constructivist based teaching strategy into their methods of teaching. The sample in this study showed a lack of representation in gender. Hence, additional research is needed to determine if there is a difference between how male and female students in Nigerian Junior Secondary Schools respond

to constructivist and conventional lecture teaching techniques.

REFERENCES

- Akpan BB (1996). Towards a reduction in the contents of our primary and secondary science curricular. *J. Sci. Teachers Assoc. Niger.* 31 (1&2): 1-5
- Brad H (2000). Teacher-Centered Instruction versus Student-Centered Instruction. *Am. Sch. Board J.* pp. 1-5.
- Caprico MW (1994). Easing into Constructivism, Connecting Meaningful Learning with Students Experience. *J. College of Science Teaching*, 23(4): 210-212.
- Carlson K (2003). Constructivism: What it Means for My Own Teaching. Center for Development of Teaching and Learning, 6(1).
- Cheek DW (1992). *Thinking Constructively About Science, Technology and Society Education*. Albany, NY: State University of New York Press.
- Colburn (2000). Constructivism: Science education's "Grand Unifying Theory". *Clearing house*, 74 (1): 1-6.
- Dogru M, Suna K (2007). Applying the subject "Cell" through constructivist approach during science lesson and the teacher's view. *Int. J. Environ. Sci. Educ.*, 2 (1): 3-13.
- Feden PD (1994). About Instructions: Powerful New Strategies Worth Knowing. *Educational Horizon*, 73(1): 121-140.
- Gallagher JJ (1993). Secondary Science Teachers and Constructivist Practice. In K. Tobin (1993), *The Practice of Constructivism in Science Education* (pp.181 – 191). Washington, DC: American Association for the Advancement of Science.
- Gatlin LS (1998). *The Effect of Pedagogy Informed by Constructivism: A Comparison of Student Achievement Across Constructivist and Traditional Classroom Environments*. Unpublished Doctoral Dissertation, University of New Orleans.
- Kurt H, Becker SM (2004). A Comparison of Students' Achievement and Attitudes Between Constructivist and Traditional Classroom Environments in Thailand Vocational Electronics Programs. *J. Vocational Educ. Res.*, 29(2): 1-3.
- Jong Suk Kim (2002). Effect of teacher training as constructivist on teacher behavior and students' achievement. Faculty research papers on the study of education, 18 (2), education development research institute, chungnam national university.
- Jong SK (2005). The effect of constructivist teacher approach on students' academic achievement, self-concept, and learning strategies. *Asia pacific education review*, 6 (1): 7-19.
- Kurt H, Becker SM (2004). A comparison of students' achievement and attitudes between constructivist and traditional classroom environment in Thailand vocational electronic programs. *J. Vocat.*

- Educ. Res. 29(2): 1-10.
- Mahoney MJ (2004). What is Constructivism and Why is it Growing? *Contemporary Psychol.* 49: 360-363.
- Makanong A (2000). The Effects of Constructivist Approaches on Ninth Grade Algebra Achievement in Thailand Secondary School Students. Unpublished Doctoral Dissertation. University of Minnesota, Minneapolis.
- Murphy E (1999). Constructivist Checklist. In *Applying Constructivist in Vocational and Career Education* (pp. 49 – 50). Columbus: Center on Education and Training for Employment, The Ohio State University.
- Olarewaju AO (1987). Some problems identified in implementing the core-curriculum for integrated science. *J. Sci. Teach. Assoc. Niger. (JSTAN)*. 25 (2), 61-67.
- Postlewaite K (1993). *Differentiated Science Teaching*. Philadelphia: Open University Press.
- Saigo BW (1999). A Study to Compare Traditional and Constructivism-based Instruction of a High School Biology Unit on Biosystematics. Unpublished Doctoral Dissertation: University of IOWA, IOWA City.
- Taylor PC, Fraser BJ, White LR (1994). CLES: An Instrument for Monitoring the Development of Constructivist Learning Environments. Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA.
- Tobin K, Tippins D (1993). Constructivism as a referent for teaching and learning. In Tobin, K. (ed), *Controversy in classroom research*, (2nd edition). Burkinham: Open University Press.
- Western Education Association Council (WEAC, 1996). *Teaching for Understanding: Educating Students for Performance*, pp. 1-8.
- White JH (1999). *Constructivism in a College Biology Classroom: Effects on Content Achievement, Cognitive Growth, and Science Attitude of at-Risk Students*. Unpublished Doctoral Dissertation, North Carolina State University, Raleigh.
- Ye Z (2003). The use of constructivist teaching model in environmental science at Beijing normal university. *China papers*, 78-83.
- Young R, Colin AA (2003). Constructivism and social constructivism in career field. *J. Vocat. Behavior*, 64: 373-388.

Full Length Research Paper

The application of strengths, weaknesses, opportunities and threats (SWOT) analysis for managing vocational and technical education (VTE) programmes for improved efficiency in Nigeria

T. L. Adepaju^{1*} and Olu Adesola Famade²

¹Department of Educational Administration and Planning, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.

²Department of Educational Management, Faculty of Education, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria.

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This paper reviews the current status of vocational and technical education programmes (VTE) in Nigeria and the major innovations of the Nigerian Government in the recent times in the sector vis-à-vis the demands of the modern world for vocational and technological development. It therefore, proposes a paradigm shift in the operation of VTE programmes in institutions of learning in Nigeria for improved efficiency through the application of The SWOT (strengths, weaknesses, opportunities and threats) analysis which has been an effective and useful tool for decision making in several organizations in recent times. In the context of this paper, SWOT is presented for use as a decision-making strategy as new vocational and technical education programme is planned. An insight into the wide range of the potential applications of SWOT analysis is also the thrust of the paper.

Key words: Vocational and technical education, Nigerian government, technological development, strengths, weaknesses, opportunities, threats, decision making.

INTRODUCTION

Vocational and technical education (VTE) plays a significant role in the socio-economic growth and development of a country. Research findings (Federal Ministry of Education, FME, 2003; UNESCO, 2005) have shown that countries that have breakthrough in the technological world today are those that have placed more emphasis and invested substantially on vocational and technological education. These countries have also re-defined their technological and vocational education through strategic planning, effective policy and appropriate decision making strategies.

Enebe (2000) highlights the significant roles which VTE can play in curbing unemployment and in providing the

needed skilled labour for industrialization. For instance, (FME, 2003) acknowledges the outstanding contributions of VTE in the development of advanced countries like the United States of America and Japan. Thus, the rapid advancement in science and technology being experienced today by these countries can be linked to the proper organization, effective, strategic planning and policy statements supported by political will. As the labour market becomes more specialized and economies demand higher levels of skills, governments and businesses are increasingly investing in the future of VTE through publicly funded training organizations and subsidized apprenticeship or traineeship initiatives for businesses (wikipedia.org/wiki/vocational). The National Policy on Education (Federal Republic of Nigeria, 2004) refers to vocational education as: that form of education, which is obtainable at the technical colleges. This is equivalent to the senior secondary education but designed to prepare

*Corresponding author. E-mail: adepojutaiwo2004@yahoo.com, adepojutl@oauife.edu.org. Tel: +2348062952955.

individuals to acquire practical skills, basic and scientific knowledge and attitude required as craftsmen and technicians at sub-professional level (p. 5).

Similarly, technical education is defined as: That aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge (FRN, 2004: p 5).

According to Enebe (2000), "technical education stresses the engineering aspect of vocational education such as electronics, electrical, mechanical and automobile works". Thus, both vocational education and technical education aim at developing, among others, useful skills for productive purposes. The world has become aware in recent times of the magnitude of the changes resulting from advances in and the intensive application of technology. Science and technological knowledge have become so important that today; they have replaced capital as society's most important resources.

The efficiency of the system of VTE of a nation is a major factor that determines its economic well-being, its standard of living, its potential growth and security. Another important factor is the amount of effort and money the nation is willing to devote to it. There is no doubt that this nation is in dire need of a good core of intermediate-level manpower in various industries to carry out their programmes. Craftsmen and technicians are the live wire of virtually all industrial activities. Without them, the machinery of industries will grind to a halt. Many industries are now being established in this country by both the private and public sectors of the economy and each of these industries depends mainly on the availability of craftsmen and technicians. It is on this note that this paper is proposing the application of SWOT analysis to the process of managing VTE programmes in Nigeria for improved efficiency.

Vocational and technical education in Nigeria: The historical perspective

The growth of VTE in Nigeria began with the early missionaries. Although, the chief aim of the missionaries was to produce church workers and spread the gospel. They were equally concerned with food production, shelter construction, water conservation, wood work, metal work, health and technical requirements of living. The Hope Waddell Training Institute in Calabar was opened in 1894 with 18 apprentices, 7 carpenters, 5 engineers, 5 printers and 1 cook-in-training. All the European instructors came from Scotland.

Government made attempts to establish vocational and technical education centres in the 20th century. For instance, at the government schools, Bonny and Benin City, instruction was given in carpentry and other crafts. Bonny Government School was residential and under the supervision of European principal. Technical and

vocational courses were also started in various government departments like Nigerian Railways, Nigerian Maritime, public work, etc. This was followed by the engineering and workshop courses at the old Yaba Higher College in 1932. There were series of developments up till April 1959 when Ashby Commission was set up to investigate into the manpower needs in Nigeria for the period of 20 years (1960 - 1980). Much of the interest in VTE and its rising status in the Nigerian education system arise from the belief that a skilled workforce is a necessary ingredient for technological development. At the level of the individual, it is believed that a skilled person works more satisfactorily than an unskilled person. The Ashby Commission Report, which was submitted in September 1960, pointed out the urgent need to improve the situation of the dearth of technical manpower in Nigeria. As a result, the Federal Government showed some concerted efforts in improving the technical manpower situation in Nigeria by recognizing the importance and including VTE as an important component of the educational system (FRN, 2004). The government also embarked on the establishment of an appreciable number of various types of vocational and technical institutions in the country

The need for vocational and technical education in Nigeria

Vocational and technical education is essential education which is intended to provide the skills and the manpower for industry and other engineering services required by society. Therefore, vocational education programme is designed to prepare skilled workers for industry, agriculture, commerce, etc from the upper secondary level. That is why the programme includes general studies, practical training for the development of skills required by the chosen occupation and related theory. The UNESCO (2005) points out that, the proportions of these components may vary considerably but the emphasis is usually on practical training which may be full-time in schools, or part-time as supplementary education for apprentices or others requiring that practical training in employment.

The ratio of manpower training is further strengthened by the Nigerian society of engineers at the three day conference recently concluded in Calabar. The society called Federal Government to co-ordinate the activities of all its agencies involved in the training of technological man-power to ensure that available resources are optimally utilized. In conclusion, more emphasis should be placed on the production and training of technicians and craftsman to achieve the desired manpower ratio range between 1- 4 - 32 and 1- 6 - 60 of engineers/technicians/craftsmen what is significant is the utilization of teaching facilities in manpower production at all levels.

The goals of vocational and technical education in Nigeria

According to the National Policy on Education (FRN, 2004), the specific goals of VTE shall be to:-

- (a) Provide trained manpower in the applied sciences, technology and business particularly arts crafts, advanced craft and technical levels.
- (b) Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development, and
- (c) Give training and impart the necessary skills to individuals who shall be self-reliant economically.

In pursuance of the above goals, the following education curricular contents are recommended:

- (a) The main feature of the curricular activities for technical colleges shall be structured in foundation and trade modules.
- (b) The curriculum for each trade shall consist of four components:-
 - (i) General education.
 - (ii) Theory and related courses.
 - (iii) Workshop practice.
 - (iv) Industrial training / production work (pp. 25-26).

Section 4, paragraph 22 (a) states the pre-vocational subjects at the Junior Secondary School level. These include: Agriculture, Business Studies, Home-Economics, Local Craft and Computer Education. At the Senior Secondary School level, the vocational subjects include the following; Agriculture, Applied Electricity, Auto-Mechanic, Book-Keeping and Accounting, Building Construction, Commerce, Computer Education, Electronics, Clothing and Textiles, Food and Nutrition, Home Management, Metal Work, Technical Drawing, Wood-work, Shorthand, Typewriting, Fine Arts and Music. In the same vein, Section 5, paragraph 35 states the range of courses in the technical colleges.

An important conceptual landmark in the effort to modernize and vitalize VTE was the publication of the first “National Plan of Vocational and Technical Education in the Republic of Nigeria”, by Skapski (FME, 2003). Skapski called for action by “a group of professional competent educators” united by a sense of mission and aware of relevant achievements in other countries to move the change process forward. He also called for pilot projects, and for “the foundation of an adequately structured general education”. Since the publication in 1966, Skapski’s master plan has been the spirit of innovation and change in the profile of VTE in Nigeria. Most of the recommendations have been implemented in one form or the other including the 3 – 3 secondary education policy from 1982, the establishment of the Industrial Training Fund (ITF) in 1971, the National Board

for Technical Education (NBTE) in 1977, and nation-wide uniform educational structure and content nation-wide from 1977. Despite all these developments, some recommendations have not yet been implemented.

The 1999 constitution requires governments in the federation to promote technology and science education (FRN, 1999) and this has led to directive to all higher institutions in Nigeria to admit students into science / technology and humanities disciplines based on ratio 60:40.

From Table 1, the types of technology education and their manpower roles were specified while the relevant institutions where these types of technology education are offered are indicated. Also, in Table 1, the academic awards issued for those that completed the programmes are also indicated. The professional roles ranged from semi-skilled manpower role to full professional (High-level manpower) role. Accordingly, those that undergone lower training receive lower level certificate while those that undergone higher training such as university education receive Bachelors’. Masters’ and Doctorates’ degrees.

Vocational and technical education, job creation, poverty reduction and self-reliance: The meeting point

VTE is no doubt, a vital instrument for achieving job creation, poverty reduction and self-reliance. The relationships that exist between VTE and each of the economy-related concepts could be expressed functionally and symbolically thus;

$$\begin{aligned}
 Jc &= f (VTE) \dots\dots\dots 1 \\
 Pr &= f (VTE) \dots\dots\dots 2 \\
 Sr &= f (VTE) \dots\dots\dots 3
 \end{aligned}$$

Alternatively, these equations may be expressed compositely thus;

$$Jc, Pr, Sr = f (VTE) \dots\dots\dots 4$$

- Where;
- Jc = Job creation,
 - Pr = Poverty reduction,
 - Sr = Self-reliance,
 - VTE = Vocational and technical education,
 - f = functional notation.

In the four equations expressed above, job creation, poverty reduction and self-reliance are dependent variables while VTE is an independent variable. The idea being expressed here is that VTE has a good potential of creating job for the unemployed graduates, reducing poverty level of the people since those who have undergone trainings in this area can establish on their own thereby getting income to feed their families, and making people stand on their own economically without depending on other people (self-reliance).

Table 1. Types of technology education in Nigeria.

S / N	Type of technology education	Principal manpower role	Principal delivery institution	Academic awards
1.	Pre-vocational education or general vocational education	Semi-skilled manpower for specific job training in apprenticeship or further formal education	Secondary Schools	WAEC / NECO Certificates in combination with other non-vocational subjects
2.	Vocational (job specific) Education	Craftsmen and Master Craftsmen (Low-level manpower)	Technical Colleges and Vocational Centres	NABTEB Certificates: NTC / NBC and ANTC / ANBC
3.	Technical education	Technicians / technologists (Middle-level manpower)	Polytechnics / Monotechnics	ND, HND, Post-HND
4.	Professional education	Professionals (High-level manpower)	Universities	Degree: Bachelors, Masters, Doctorates

Sources: World Bank and FME (1998, pii).

Problems associated with VTE in Nigeria

Several problems are militating against VTE in Nigeria. These problems may be grouped under the following:

- (i) Manpower supply related problem (see Appendix I).
- (ii) Resources / equipment related problem.
- (iii) Orientation of people / attitude of people towards VTE.
- (iv) Finance / Funds.
- (v) Energy related problem.
- (vi) Political Instability which often leads to incessant change in policies on VTE.
- (vii) Lack of strategic planning.

These and other problems have negative influence on the full realization of the goals of TVE in Nigeria.

Government recent actions and innovation efforts

The immediate past administration (1999-2007) reshaped, to some extent, the terrain of technology and science education for better performance. In awareness of the problems that beset the full realization of the goals of TVE, a national seminar was held in November, 2000, in collaboration with UNESCO. The goals of the seminar were to reengineer and reposition VTE for better performance in the 21st century and to market prescribed reforms to stakeholders. The material outcome of the seminar was the preparation of a national master plan for the development of TVE in the 21st century. Key ideas in the national master plan include the institution of entrepreneurial education at all levels, raising the quality of VTE, expanding access and inclusion, increasing number and improving quality of technology teachers,

intensive marketing of VTE, and improving the managerial capacity of the sub-sector.

Some modest achievements in the last few years include rehabilitation and expansion of facilities, curriculum revision and teaching capacity building in collaboration with UNESCO. Increased flexibility in the system enables the *hitherto* excluded products of technical colleges to gain admission more easily into tertiary institutions. There is a gradual change of social attitude towards technology education and science education, and a focusing of government attention on their development. There is also a growing recognition of the importance of technology and science for the success of democracy, attainment of mass employment and national economic development. VTE, with a scheme of financial empowerment of the clientele, is now government's main approach to poverty eradication. The National Poverty Eradication Programme (NAPEP), as a parastatal of the federal government for poverty eradication, spearheads the idea of the use of VTE with financial empowerment of the clientele to eradicate poverty.

In 2002, the federal government took a step further to reposition VTE for greater advantage in the national education scheme. Major policy innovations in this regard include:

- (i) The reversal of federal technical college craft programmes to full secondary education duration of six years. Students from primary schools are admitted into the junior college component of technical colleges to enable the technical colleges stand a fair chance of having good quality entrants as well as provide an early orientation to students towards technology education and the world of work. In addition, the FME has converted its technical colleges to science and technical colleges

offering senior school science and normal craft and advanced craft programmes at senior secondary level to attract entrants.

(ii) Setting up an action plan, following the resolutions of Higher Education Summit in 2002, to review the policy and mandates of polytechnics and colleges of education to enable them award degrees. Government is therefore, considering the adoption of a policy of separate development and independent operation of tertiary institutions. The policy of separate development is geared towards eliminating all forms of marginalization consequent upon the old tradition.

(iii) Setting up of an action plan to review the ceiling in career progression of graduates and staff of polytechnics and colleges of education, so that, the historical disparities between university and polytechnic graduates may be eliminated.

(iv) Setting up plans to integrate entrepreneurial education into the scheme of technology education.

(v) Introduction of post-HND programmes to enable holders of HND to qualify for professional registration and practice (FME, 2003).

Apart from the efforts put in place by the government which served as springboard for several technology-based institutions and organizations, such institutions and organizations that are technology inclined have also organized several workshops, seminars and conferences to educate people on the need to improve technology education in the country.

Application of SWOT analysis for initiating new educational programmes: The case of VTE

The external environment has a profound impact on educational institutions. During the final decade of the twentieth century, America's institutions, economy, society, political structures, and even individual lifestyles are poised for new changes. Recent, shifts from an industrial to an information-based society and from a manufacturing to a service-oriented economy has significantly impacted the demands made on vocational programmes offerings (Martin, 1989).

Vocational programmes in comprehensive schools generally cover a broad spectrum of service areas, but they provide fewer overall programmes within each of these areas than are provided in either vocational or specialty schools (Weber, 1989). Existing programmes and those planned for the future irrespective of the type of school, should be based on a careful consideration of future trends in society. Vocational administrators should become initiators in shaping the future of their institutions. Strategies must be developed to ensure that institutions will be responsible to the needs of the people. The Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis (also referred to as the SWOT analysis in some management texts), provides a framework for

educational administrators to focus better on serving the needs of their communities.

Although, originally intended for use in business applications, the idea of using this tool in educational settings is not altogether new. For example, Gorski (1991) suggested this approach to increase minority enrollment in community and other regional colleges. Management tools originally intended for industry can frequently be tailored for application in education due to fundamental similarities in the administrative duties of the respective chief executive officers.

SWOT is a simple, easy-to-understand technique. It can be used in formulating strategies and policies for the administrator. However, it is by no means to an end of itself. The purpose of this paper is to demonstrate how SWOT can be used by administrators to analyze and initiate new programme offerings in vocational education.

The context of SWOT

SWOT analysis can be simply understood as the examination of an organization's internal strengths and weaknesses, and its environments, opportunities, and threats. It is a general tool designed to be used in the preliminary stages of decision-making and as a precursor to strategic planning in various kinds of applications (wikipedia.org/wiki/vocational). When correctly applied, it is possible for a vocational school to get an overall picture of its present situation in relation to its community, other colleges, and the industries its students will enter. An understanding of the external factors (comprised of threats and opportunities) coupled with an internal examination of strengths and weaknesses assists in forming a vision of the future and in making appropriate decisions. Such foresight would translate to initiating competent programmes or replacing redundant, irrelevant programmes with innovative and relevant ones.

The first step in a SWOT analysis is to make a worksheet by drawing a cross, creating four sectors $\frac{3}{4}$ one each for strengths, weaknesses, opportunities, and threats. An outline of a worksheet is shown in Table 2. The next step is to list specific items related to the problem at hand, under the appropriate heading in the worksheet. It is best to limit the list to 10 or fewer points per heading and to avoid over-generalizations.

SWOT can be performed by the individual administrator or in groups. Group techniques are particularly effective in providing structure, objectivity, clarity and focus to discussions about strategy which might otherwise tend to wander or else be strongly influenced by politics and personalities. It should be noted that when working in groups in educational settings, three distinct attitudes (positive/participative, negative/non-participative and neutral/indecision) emerge among teachers depending on their years of service. Teachers having 0 - 6 years of experience tend to be the most participative and receptive to new ideas. The SWOT should cover all of the

Table 2. A SWOT worksheet.

Potential internal strengths	Potential internal weaknesses
1.	1.
2.	2.
3.	3.
4.	4.
S	W
O	T
Potential external opportunities	Potential external threats
1.	1.
2.	2.
3.	3.
4.	4.

following areas, each of which may be a source of strengths weaknesses, opportunities or threats:

(a) Internal environment of the institution:

- (i) Faculty and staff.
- (ii) Classrooms, laboratories and facilities (the learning environment).
- (iii) Current students.
- (iv) Operating budget.
- (v) Various committees, and
- (vi) Research programmes.

(b) External environment of the institution:

- (i) Prospective employers of graduates.
- (ii) Parents and families of students.
- (iii) Competing colleges.
- (iv) Preparatory high schools.
- (v) Population demographics, and
- (vi) Funding agencies.

The internal survey of weaknesses and strengths

Historically, administrators seek to attract students to their college programmes by increased promotional and advertisement efforts without paying any heed to their institution's strengths and weaknesses. If, indeed, such internal audits are carried out, areas requiring some changes will reveal themselves. Furthermore, the potential and possibilities for new services and programmes may also emerge. Making a list of internal weaknesses could reveal areas that can be changed to improve the college as well as some things that are beyond control.

Examples of inherent weaknesses are quite numerous. A few are listed as follows: low staff and faculty morale; poor building infrastructure; sub-standard laboratory and workshop facilities; scarce instructional resources; and even the location of the institution within the community. Seldom do weaknesses occur in isolation. Strengths are present and need to be enlisted as well. Examples of potential strengths could be: (a) a reasonable tuition fee charged from students; (b) strong and dedicated faculty with a high morale; (c) articulation with other four-year colleges and universities which would enable students to transfer course credits; (d) a strong reputation for providing the training required to get entry-level employment; and (e) diversity within the student population.

Minority enrollment and retention is a particularly important emerging issue because vocational schools have a mission to education for people from all sectors of society (Gorski, 1991; Radha and Dugger, 1995). The assessment of strengths and weaknesses is also facilitated through surveys, focus groups, interviews with current and past students, and other knowledgeable sources. Once weaknesses and strengths are delineated, it would be appropriate to reconfirm these items. It should be recognized that different perceptions may exist depending on the representative group consulted. Figure 2 depicts an example using a SWOT analysis.

Introduction of a new programme in a community vocational and technical school / college using SWOT analysis

Let us consider a community vocational and technical school / college planning to add a new programme of producing air conditioner. The management could meet and conduct a SWOT analysis to help develop a strategy. The following points may appear on the worksheet as shown in Table 3.

Drawbacks of SWOT

SWOT analysis usually reflects a person's existing position and viewpoint, which can be misused to justify a previously decided course of action rather than used as a means to open up new possibilities. It is important to note that sometimes threats can also be viewed as opportunities, depending on the people or groups involved. There is a saying, "A pessimist is a person who sees a calamity in an opportunity, and an optimist is one who sees an opportunity in a calamity." In the example provided in Figure 2, the opportunity provided by experts in industry to train students and may be viewed by management members as a threat to their own position and job.

SWOT can allow institutions to take a lazy course and look for 'fit' rather than to 'stretch', they look for strengths that match opportunities yet ignore the opportunities they

Table 3. Sample SWOT analysis used to consider the feasibility of initiating air conditioner technology programmed.

Potential internal strengths	Potential internal weaknesses
Existing electronics and electrical programmes could provide some basics required for air conditioner technology programmed.	Current college is not well versed in air conditioner technology.
College is enthusiastic and willing to go the extra mile to acquire knowledge and training in air conditioner.	Lack of sufficient space for the required extra equipment.
Sufficient funds to invest in high technology programmes.	Current safety features are not adequate for handling potential hazards such as air conditioner.
Successful experiences in the past with new, dynamic programmes, thus, expertise in dealing with change.	4) A faction in the college wants a programmed in microprocessor technology rather than in air conditioner technology.
W	S
O	T
Potential external opportunities	Potential external threats
Local area hospitals, metal industries and communication companies suffer from a critical shortage of air conditioner technologists.	The technical college in a nearby community has already taken a lead and possesses the infrastructure to start air conditioner technology programmed any time soon.
State and nation-wide demand for air conditioner technologists is projected to increase for the next 10 years.	Programming many not get approval from the board because of previous history of accidents of the college.
Local high school teachers' and students' enthusiasm for the proposed programmed could result in recruiting the best students.	Some efficient and cheaper alternatives to air conditioner devices are appearing in recent literature which, if true, will not hold a bright future for prospective air conditioner technologists.
Expert air conditioner technologists in industries have offered to give their expertise on a part-time basis.	High school students in the area indicate a preference for business programmes rather than technical ones.

Source: Adapted from Radha and Dugger (1995: p. 236).

do not feel they can use to their advantage. A more active approach would be to involve and identifying the most attractive opportunities and then plan to stretch the college to meet these opportunities. This would make the strategy as a challenge to the institution rather than a fit between its existing strengths and the opportunities it chooses to develop (Radha and Dugger, 1995).

SUMMARY AND CONCLUSION

The paper has established the roles of vocational and technical education (VTE) in the development of any nation. Apart from the fact that this form of education is specifically designed to prepare skillful manpower for economic growth and development, it also encourages practical and creative activities that could create opportunity for the learners to be self reliant and, it is the type of education that affords the learner(s), the skills and

knowledge valuable in the labour market. This paper has reviewed the current status of vocational and technical education programmes in Nigeria and the major innovations of the Nigerian government in the recent times in the sector vis-à-vis the demands of the modern world of vocational and technological development.

The paper therefore, proposes a paradigm shift in the operation of VTE programmes in our institutions of learning in Nigeria for improved efficiency through the application of the SWOT (strengths, weaknesses, opportunities, and threats) analysis which has been an effective and useful tool for decision making as new vocational and technical education programmes are planned. An example of VTE programme using the SWOT analysis is provided in the paper. An insight into the wide range of the potential applications of SWOT has also been established in the paper. Probably, the strongest message from a SWOT analysis is that, whatever course of action is decided, decision making should contain each of the following

elements: building on strengths, minimizing weaknesses, seizing opportunities, and counteracting threats.

As remarked by Radha and Dugger (1995), in order to be most effectively used, a SWOT analysis needs to be flexible. Situations change with the passage of time and an updated analysis should be made frequently. SWOT is neither cumbersome nor time-consuming and is effective because of its simplicity. Used creatively, SWOT can form a foundation upon which to construct numerous strategic plans for the vocational schools.

REFERENCES

- Enebe PA (2000). 'Vocational and technical education teachers in Nigeria: issues and their implications for vocational and technical education' In Akinmade, C. T. O; Oyetunde, T. O; Akpa, G. O.
- FME (2003). Education sector status report. Abuja: Federal Government Press.
- Federal Republic of Nigeria (1999). Constitution of the Federal Republic of Nigeria. Lagos : Government Press.
- Federal Republic of Nigeria (2004). National policy on education. Lagos: NERDC Press.
- Gorski S E (1991). The swot team - Focusing on minorities. Community, Technical, and Junior Coll. J. 61(3): 30-33.
- Martin WR (1989). Handbook on marketing vocational education. Westerville: Ohio State Council on Vocational Education.
- Radha B, Dugger JC (1995). 'SWOT analysis: A management tool for initiating new programs in vocational schools' J. Vocational and Technical Educ. 12 (1): 234-237.
- UNESCO (2005). Education in the African continent. Paris.
- Weber JM (1989). Variations in selected characteristics across three types of high schools that offer vocational programs. J. Ind. Teach. Educ. 26(4): 5-37.
- Wikipedia.org/wiki/vocational_ Retrieved on Friday, 21st of September, 2007.
- World Bank / FME (1998). Education in sub-saharan Africa: Policies for adjustment, revitalization and expansion. Washington, D. C. World Bank.

Full Length Research Paper

Statistical measurement of educational development of school education at state level

Vishal D. Pajankar^{1*}, Pranali² and P. G. Khot²

¹National Council of Educational Research and Training, New Delhi, India.

²Rashtrasant Takadoji Maharaj Nagpur University, Nagpur, India.

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Education especially school education is one of the very important components of social development. Since independence, education has been visualized in government policies as a precursor to national development as well as to better quality of life. Due to the initiative taken by the states and centre, education system in India has expanded exponentially over the past years, but its current achievement is grossly inadequate in realizing its potential greatness. Social development is not pre-determined but is a continuous process of improvement of level of living. The level of development cannot be fully estimated by a single indicator. Moreover, a number of indicators when analyzed individually do not provide an integrated and easily comprehensible picture of reality and thus need to be analyzed together. Therefore, the study has worked out the status of development in school education on the basis of a number of their developmental indicators. Narain et al. (1991) estimated the level of socio-economic development for different states for the year 1971 - 1972 and 1981 - 1982. The study revealed that there were wide disparities in the level of development among different states. Narain et al. (2007) evaluated the composite indices of development in respect of agricultural, infrastructural and socio-economic sectors for 282 districts. The present study has designed 'weighted composite index'. The level of development has been estimated with the help of weighted composite index based on optimum combination of all the developmental indicators.

Key words: Composite index, weighted composite index, development indicators.

INTRODUCTION

Since 1990, the United Nations annually ranks all member countries in the world on the basis of health, education and income; the three essential aspects of human development. The human development index decides the relative rank of a country's achievement with the above aspects in a concise manner. It helps to locate the countries with immediate concerns as well as prioritize the relevant policy areas globally. A well designed public policy and programme can advance human development

even without high levels of income or economic growth (United Nations Development Programme, 2004). Nevertheless, the national level figure of the index has its own limitations in the policy formulation, especially for a large country like India where socio-cultural, demographic and economic milieus are diversified. To minimize such limitations, one needs to adopt a measure that can capture disparities in aspects of human wellbeing where appropriate policy actions are urgent at the level of the smallest possible administrative unit.

In accordance with the constitutional commitment to ensure free and compulsory education for all children up to the age of 14 years, provision of universal elementary education has been a salient feature of national policy since independence. This resolve has been spelt out emphatically in the National Policy of Education (NPE), 1986 and the Programme of Action (POA), 1992. The 86th Constitutional Amendment Act, 2002 made education a

*Corresponding author. E-mail: vdp1234@rediffmail.com or vishal1819@gmail.com.

Abbreviations: UTs, Union territories; GER, gross enrolment ratio; NCERT, national council of educational research and training; MHRD, ministry of human resource development; SC, scheduled castes; ST, scheduled tribes.

fundamental right for children within the age group of 6 - 14 years. The Government of India launched a programme, Sarva Shiksha Abhiyan (SSA) in 2000, a holistic and convergent programme to achieve the long cherished goal of Universalisation of Elementary Education of Satisfactory Quality by 2010. The SSA is an effort to recognize the need for improving the performance of school system and to provide community owned quality elementary education in a mission mode.

The assessment of the current state of development of population stabilization efforts along with overall human development of the districts of India was studied by Ram and Shekhar (2006). The study reiterates that not only are inter-state differentials substantial, but within a state, districts also vary considerably by their achievements in socio-demographic, health and social infrastructure development. The level of socio-economic development was estimated for different states for the year 1971 - 1972 and 1981 - 1982 by Narain et al. (1991). The study revealed that there were wide disparities in the level of development among different states. Narain et al. (2007) evaluated the composite indices of development in respect of agricultural, infrastructural and socio-economic sectors for 282 districts. Raju et al. (2008) made the index on educational development and highlight the inter-state disparity in development of elementary school education. The study used the method by accommodating expert driven weights in an equal weighting method. The present research work is an extension of this study.

As development is a multidimensional process its impact cannot be fully captured by any single indicator. Statistical measurement of educational development in different spheres is important. But a number of indicators when analyzed individually do not provide an integrated and easily comprehensible picture of reality. Hence, there is a need for building up a composite index of systemic quality/educational development based on various indicators. On the basis of this index various states and union territories (UTs) can be compared to know where they stand in terms of systemic quality / educational prosperity in comparison to other states and UTs. In view of this background a need is felt to compare various state/UTs with respect to their educational prosperity using an appropriate composite index.

COMPONENT INDICATORS

1. Access to school within a walking distance (1 km for primary level and 3 km for upper primary level)

Access to school within a walk-able distance is measured by percentage population of children having access to primary schools within 1 km and percentage population of children having access to upper primary schools within 3 km at primary and upper primary levels, respectively. The relevant data was culled from 7th All India School Education Survey (7th AISES) conducted by National Council

of Educational Research and Training (NCERT 2007a) with reference date as September 30, 2002.

2. Enrolment ratio

Enrolment ratio, being a measure of participation of children in school education, has been considered to be a component indicator of the model to be developed. It has been measured by gross enrolment ratio at primary and upper primary levels. The relevant data was taken from the 7th AISES of NCERT (2007b).

3. Equity in educational opportunities

The sub-components that jointly represent the main component of 'Equity in Educational Opportunities' are:

Gender equity: Gender equity is measured by percentage of girls' enrolment at primary and upper primary levels. Classes' I-V and classes' VI-VIII are considered as primary and upper primary levels, respectively, for this indicator. The data was taken from the 7th AISES of NCERT (2007b).

Social equity: Social equity cannot be measured by percentage of scheduled castes (SC)/scheduled tribes (ST) of children who enrolled at primary and upper primary levels as their prevalence varies from state to state. Unlike the gender of a child it is not a naturally determined phenomenon. Hence gross enrolment ratio (GER) is considered in this study. The data of these indicators has been taken from selected education statistics - 2002 - 2003 of Ministry of Human Resource Development (MHRD 2004). It is worth mentioning at this juncture that GER is more than 100 in case of certain state / UTs on account of over age and under age children enrolment. For practical purposes GER is taken as 100 for those state / UTs. The social equity, finally, is measured by the simple average of GER of SC children and GER of ST children at primary and upper primary levels separately. The GER for ST in state/UTs with no SC population for example Nagaland is considered similarly, for the state / UTs not having ST population for example Punjab, the GER for SC is considered.

Equity with regard to children with special needs:

There was equity with regard to children with special needs; by equity it means educational opportunities for disabled children. Been a natural phenomenon, the state-to-state variation in prevalence of disabled children is not expected to be significant; the sub-component can be measured by percentage of disabled children in the total enrolment at primary and upper primary levels separately. Data for this indicator was taken from the 7th AISES of NCERT (2007c).

EMPIRICAL ANALYSIS

For the study, data from various sources were taken into

Table 1. Educational development at elementary level - interstate perspective.

States/Uts	Primary stage		Upper primary stage		Elementary stage	
	Di	Rank	Di	Rank	Di	Rank
Andhra Pradesh	0.65301	25	0.59240	15	0.62271	21
Arunachal Pradesh	0.46915	5	0.42114	2	0.44515	2
Assam	0.41084	4	0.56997	14	0.49041	5
Bihar	0.47897	9	0.48697	4	0.48297	3
Chhattisgarh	0.59970	20	0.50161	5	0.55065	13
Goa	0.57723	19	0.74956	30	0.66340	28
Gujarat	0.73029	30	0.70680	27	0.71854	31
Haryana	0.57385	18	0.65897	22	0.61641	20
Himachal Pradesh	0.47670	8	0.69783	26	0.58727	16
Jammu and Kashmir	0.48088	10	0.56438	13	0.52263	10
Jharkhand	0.34910	2	0.32021	1	0.33465	1
Karnataka	0.66164	26	0.66540	23	0.66352	29
Kerala	0.50553	14	0.77184	32	0.63868	24
Madhya Pradesh	0.54844	17	0.53137	9	0.53990	12
Maharashtra	0.63029	23	0.67167	24	0.65098	25
Manipur	0.69394	28	0.51218	7	0.60306	17
Meghalaya	0.78463	32	0.60975	17	0.69719	30
Mizoram	0.89596	35	0.74473	29	0.82035	34
Nagaland	0.73600	31	0.53315	10	0.63457	23
Orissa	0.53082	16	0.53400	11	0.53241	11
Punjab	0.60050	21	0.64523	20	0.62287	22
Rajasthan	0.47321	7	0.51866	8	0.49593	6
Sikkim	0.48754	12	0.50701	6	0.49727	7
Tamil Nadu	0.64839	24	0.67454	25	0.66146	27
Tripura	0.66214	27	0.65394	21	0.65804	26
Uttar Pradesh	0.48627	11	0.48105	3	0.48366	4
Uttranchal	0.52568	15	0.62314	18	0.57441	15
West Bengal	0.60542	22	0.60792	16	0.60667	19
A & N Islands	0.47205	6	0.54198	12	0.50701	8
Chandigarh	0.49114	13	0.63119	19	0.56116	14
D & N Haveli	0.81324	33	0.72463	28	0.76894	32
Daman & Diu	0.40069	3	0.80883	33	0.60476	18
Delhi	0.29071	1	0.74981	31	0.52026	9
Lakshadweep	0.87156	34	0.94475	35	0.90815	35
Pondicherry	0.70219	29	0.85068	34	0.77643	33

consideration. The data were obtained from census of India 2001, Seventh All India School Education Survey conducted by NCERT with reference date 30th September 2002 and DISE's Elementary Education in India –

Analytical Report 2006 - 2007. The study was used to measure the educational development of various states / UTs at elementary level school education. The study utilizes data on various types of socio economic indica-

tors involved in the elementary stage school education. The method of analysis are stated below

Let $[X_{ij}]$, $i = 1, 2, \dots, n$ (number of area unit); $j = 1, 2, \dots, k$ (number of indicators), is a data matrix that comes from different units of measurement and the objective is to arrive at a single composite index. There is a need for standardization of the indicators.

Let $[Z_{ij}]$ denotes the matrix of standardized indicators, where $i = 1, 2, \dots, n$ and $j = 1, 2, \dots, k$. The best state for each indicator is identified and from this the deviations of the value for each state are taken. This procedure is to be adopted for all the indicators under study. They are defined as:

$$C_i = \left\{ \sum_{j=1}^k (Z_{ij} - Z_{0j})^2 \right\}^{1/2}$$

Where Z_{0j} is the standardized value of the j^{th} indicator of the best state and C_i denotes the pattern of development of i^{th} state. The composite index of development is now computed for each state using the following formula.

$$D_i = \frac{C_i}{C}$$

Where

$$C = \bar{C} + 2S$$

Where \bar{C} is the mean of C_i

S is the standard deviation of C_i

The value of composite index is non-negative and it lies between 0 and 1. The value of index closer to zero indicates the high level of development while the value of index closer to one indicates the low level of development.

FINDINGS AND DISCUSSION OF THE STUDY

The composite indices of development in respect of education development – elementary school education have been calculated for all 35 states/UTs. It would be of interest to examine the level of development separately for different states.

The measurement of educational development in respect of accessing school, gross enrolment ratio and equity has been identified at primary and upper primary stages of schooling in India. The study also identified the educational development at elementary stage of school education. Average rank of a state over primary and upper primary levels has been used to depict the situation at elementary level. The corresponding results are presented in Table 1.

The ranking of states with regard to educational development at elementary level shows that Jharkand is at top position in the country followed by Arunachal Pradesh (2nd), Bihar (3rd), Uttar Pradesh (4th), Assam (5th), Rajesthan (6th); Sikkim (7th); Andaman and Nikobar Island (8th); Delhi (9th) and Jammu and Kashmir (10th). The state / UTs which are in the range of 26th to 35th may be considered that educational development is utterly poor in respect of accessing of school, gross enrolment ratio and equity. In this category, Lakshdweep is in 35th position followed by Mizoram (34th); Pondicherry (33rd); Dadar and Nagar Hawali (32nd) and Meghalaya (31st).

At primary stage of school education, Delhi is in the 1st position showing highest level of educational development. Jharkhand is in 2nd position while Daman and Diu is in 3rd position. The other states/UTs with better development in primary education are Assam (4th); Arunachal Pradesh (5th); Andaman and Nicobar Island (6th); Rajesthan (7th); Himachal Pradesh (8th); Bihar (9th) and Jammu and Kashmir (10th). The states/UTs which are very low in primary education in, respectively, defined conditions are Nagaland (31st); Meghalaya (32nd); Dadar and Nagar Hawali (33rd); Lakshadweep (34th) and Mizoram (35th).

At upper primary stage, Jharkhand jumped to 1st position followed by Arunachal Pradesh (2nd); Uttar Pradesh (3rd); Bihar (4th) and Chhattisgarh (5th). The other states/UTs with better development in upper primary stage schooling are Sikkim (6th); Manipur (7th); Rajesthan (8th); Madhya Pradesh (9th) and Nagaland (10th). The states/UTs which are very poor in upper primary stage schooling are Delhi (31st); Kerala (32nd); Daman and Diu (33rd); Pondicherry (34th) and Lakshadweep (35th).

REFERENCES

- MHRD (2004). Selected Educational Statistics - 2002-03, MHRD, Govt. of India, New Delhi.
- Narain P, Rai SC, Shanti S (1991). Statistical Evaluation of Development on Socio-Economic Front Journal of Indian Society of Agriculture Statistics, 43 (3): 329-345.
- Narain P, Sharma SD, Rai SC, Bhatia VK (2007). Statistical Evaluation of Social Development at District Level Journal of Indian Society of Agriculture Statistics, 61 (2): 216-226.
- NCERT (2007). Seventh All India School Education Survey - Schooling Facilities in Rural Area National Council of Educational Research and Training, New Delhi.
- NCERT (2007). Seventh All India School Education Survey - Enrolment in Schools. National Council of Educational Research and Training, New Delhi
- NCERT (2007). Seventh All India School Education Survey – Schools for Physically Challenged Children. National Council of Educational Research and Training, New Delhi. (in-print)
- NCERT (2007). Seventh All India School Education Survey - Database. National Council of Educational Research and Training, New Delhi
- Raju BMK, Singh A, Bansal (2008). Development of Educational Development Index (EDI), Research Project Report, National Council of Educational Research and Training, New Delhi.
- Ram F, Shekhar C (2006). Ranking and Mapping of Districts: Based on Socio-economic and Demographic Indicators, Research Project Report, International Institute of Population Sciences, Mumbai.

Full Length Research Paper

Piaget's theory of intellectual development and its implication for instructional management at pre-secondary school level

Enose M. W. Simatwa

Department of Educational Management and Foundations, Maseno University, MASENO, Kenya.
E-mail: simatwae@yahoo.com. Tel: 254735261121.

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Instructional management focuses on planning, execution and evaluation of learning experiences. For teachers in pre-secondary schools to plan, execute and evaluate learning experiences effectively, they need to have good understanding of the process of cognitive development in children. Piaget has postulated that children progress through a series of four stages beginning with rudimentary reflex responses and achieving full maturity with the attainment of formal deductive reasoning. Piaget's theory also postulates that a child is an active investigator who acts upon his environment with reflex responses during infancy and then with more complex responses that emerge from early interactions. Piaget views interaction as a two-way process, one of which is accommodation and the other is assimilation. In accommodation the child's knowledge of the environment is modified to incorporate new experiences which are adaptive to the broad aspect of cognitive demands imposed by the environment. In assimilation, the child incorporates new experiences into an existing structure. Accommodation and assimilation are reciprocal and their interaction generates cognitive growth. Understanding and application of Piaget's Theory is important in the effective enhancement of teaching and learning process at pre-secondary school level. Consequently, teacher trainers, trainee teachers and practicing teachers need to keep abreast of Piaget's theory of intellectual development.

Key words: Intellectual development, Instructional management and Pre-secondary schools.

INTRODUCTION

Jean Piaget's theory of intellectual development (Flavell, 1963) is considered a leading theory on cognitive development (Flavell, 1963). Piaget's theory asserts that intellectual development is a direct continuation of inborn biological development. That is the child is born biologically equipped to make a variety of motor responses, which provide them with the framework for the thought processes that follow. That is, the ability to think springs from the physiological base. Piaget maintains that intelligence is rooted in two biological attributes found in all living creature: organization and adaptation. Organization is the tendency of every living organism to integrate processes into coherent systems. It occurs, for instance, when an infant, originally capable of either look-

ing at objects or grasping them, integrates these two separate processes into a higher order structures which enable him to grasp something at the same time he looks at it. Adaptation is the innate tendency of a child to interact with his environment. This interaction fosters the development of a progressively complex mental organization.

Each stage in this sequence of development provides the foundation for the next stage permitting progressively complex and effective adaptations to the environment. Adaptation comprises two complementary processes of assimilation and accommodation. The child assimilates experiences and fits them into the expanding structure of the intellect when he encounters new experiences which he

cannot fit into the existing structure accommodation, or modified way of reacting takes place. Piaget stresses that as children mature mentally, they pass sequentially through four major stages of cognitive development, each stage having several sub stages (Hertherington and Park, 1975). The major stages of cognitive growth are:

1. Sensory motor stage - 0 - 2 years
2. Preoperational or intuitive stage - 2 - 7 years
3. Concrete operations stage - 7 - 11 years
4. Formal operations stage - 11 - 15 years

These stages are of a probabilistic nature. At most ages it is possible for a child to exhibit behavior characteristic of more than a single stage because heredity interacts with environment. Each stage is a system of thinking that is quantitatively different from the preceding stage. Each stage is a major transformation in thought processes compared to the preceding stage. The stages are sequential and follow an invariant sequence. This means that the child cannot skip or miss a stage or by-pass a stage. He must go through each stage in a regular sequence. Children cannot overcome a developmental lag or speed up their movement from one stage to the next. They need to have sufficient experience in each stage and sufficient time to internalize that experience before they can move on.

MENTAL DEVELOPMENT OF CHILDREN AT VARIOUS STAGES AND THEIR IMPLICATIONS FOR INSTRUCTIONAL MANAGEMENT

Pre-school (sensory motor) 0-2 years

During this stage, cognitive activity is based on immediate experience through the senses (Meyer and Dusek, 1979). The major intellectual activity here is the interaction of the senses and the environment. Children have not developed a language for labeling experiences or symbolizing and hence remembering events and ideas. They therefore see what is happening and feel it, but they have no way of categorizing their experiences. Responses are almost completely determined by the situation. For example, a hungry child will literally scream the house down for food. It does no good to tell a six month – old, “now just a moment”, I am warming your milk. The child has no way to represent the idea that in one or two minutes, nice warm milk will appear in a bottle. He obviously does not know what a minute is or what any of those other words mean.

During this stage a phenomenon known as “visual pursuit” is manifested. The child will visually pursue an object relentlessly, long after an older child would have lost interest. Such visual pursuit develops the capacity of “object permanence”, a primitive form of memory (Meyer and Dusek, 1979). As children begin to develop intellectually, they understand that when an object disappears from view, it still exists even though they

cannot see it. This implies that day-care centers should operate quality programmes that guarantee a rich and responsive sensory environment. This in effect should be directed to nurturing the innate faculty of intellectual development. It also means that daycare center managers should be knowledgeable in balanced nutrition matters.

Nursery school (pre-operational or intuitive): 2-7 years

During this stage intuitive mode of thought prevails characterized by free association, fantasy and unique illogical meaning. The child can symbolize experience mentally. This is facilitated by the development of language skills (Meyer and Dusek, 1979). He uses egocentric speech. Children often talk at, rather than to each other in what Piaget calls collective monologues. The child learns to associate words and symbols with objects. He develops an awareness of the conservation of mass, weight and volume.

Since the nursery school child has to solve new problems on the basis of a limited past experience, he is likely to encounter contradictions as a result of faulty generalizing (Meyer and Dusek, 1979). When faced with such contradictions, a child at a lower level of development usually shrinks from them but a child at a higher level may become disturbed.

This is illustrated by the experiments in which children watch someone pouring colored water back and forth between a 200 ml beaker and a 500 ml beaker. A four year-old may be totally unconcerned about the fact that the water level differs in the two containers. He will simply maintain that the beaker with a higher level has more colored water. A somewhat older child, however, may become upset about this discrepancy between what he expected and what he sees eventually. After a few months of maturation and experience the child will be able to comprehend why the water level is different. The beaker experiment illustrates conservation, the principle that certain properties are conserved or remain constant, regardless of changes in appearance. The child's earliest conservation is that of mass.

If a four year old is shown two coloured plasticine balls of the same size and then one of them is flattened as he watches, he is likely to say that the flattened one contains more plasticine. By age five, most children are able to comprehend that even though the shape is different; the mass is the same (O'Bryan and Boersma, 1971).

If a nursery school teacher places balls on a weighing machine to show that they are the same weight and then flattens one ball, only an older nursery school pupil is likely to predict that they will still balance. However, if the teacher drops the two plasticine balls into equal amounts of water in graduated cylinders and then flattens one, probably not even the oldest child in nursery school will be able to predict that the water level will be raised to the

same level by both the round and elongated balls of plasticine (Meyer and Dusek, 1979)

Piaget (1952) points out that until the child has developed a one to one correspondence, he does not have the foundation for learning the concept of number. The child must grasp the principle of conservation before he can comprehend the concept of number. The understanding of number is based on the awareness that cardinal numbers are invariant regardless of the other factors. Understanding the concept of number requires more than the ability to count. For instance, if any nursery school teacher gets six oranges and four bananas, and asks his pupils to count them. He needs to ensure that they understand that both oranges and bananas are called fruits. He then asks which are more? the oranges or the fruits. Chances are that most nursery school children will answer "oranges".

The teacher should ensure that the curriculum for nursery school pupils should be one that encourages the teacher to talk a great deal to children, read to them, and teach their songs and nursery rhymes. The teacher should also provide a dialogue time in which children have a natural opportunity for talking. Many should be helped to become good listeners. It may be necessary to provide talking opportunities between the loquacious and silent extremes. Ways of avoiding wrong dialogue should be devised, for example a vivid account of a fight between a child's parents.

The teacher should encourage imagination and inventiveness in his pupils as much as possible using play, story telling and painting (Flavell, 1977). Some children may be so imaginative that they fail to distinguish between what is real and what is make-believe, a factor that can lead to adjustment problems. This can be overcome by either the teacher encouraging his pupils to tell stories during story-time but not during the rest of the day, stressing that while it is wonderful to be able to make up stories, sometimes it is necessary to describe exactly what happens.

Lower primary school (concrete operations) 7-11 years standard I, II, III and IV

The two basic objectives for a curriculum at this stage are:

- a) The child should be able to learn fundamental skills in reading, writing and calculating arithmetic problems.
- b) The child should be able to accept his own aptitude for school.

The lower primary school child is at the stage of concrete operations. The child here is concerned with knowing only the facts and therefore becomes confused when faced with the relative, probabilistic nature of human knowledge. The switch over from egocentric to socialized

speech takes place at about class two. Comprehension of the principle of conservation permits children to grasp the concept of number. This enables them to use cardinal numbers: 1, 2, 3, 4 which are invariant regardless of whether they apply to oranges, bananas or fruits. They are also able to use ordinal numbers; 1st, 2nd, 3rd, 4th, the child can handle situations that require adding to and subtracting from. Understanding of the concept of ordinal numbers permits the child to classify objects in many ways, according to their various quantities; such as size and weight. The ability to order objects, that is, to arrange them in various series according to different criteria, illustrates the process of decentration. Decentration (Elkind, 1969) means that the child does not center his thinking on just one aspect of a subject or object or material but on two or more dimensions at once (Anita, 2004). This explains why an older child can solve conservation problems; for he can take into account size and weight or size and volume simultaneously. Decentration also permits the child to grasp the concept of reversibility. The child can comprehend that pouring water from the tall and the short beakers back into the original containers restores it to the original condition. The children can combine the various parts to make a whole and can even consider and reason about the various parts and the whole object at the same time and the concepts and the ability to manoeuvre them in the mind. The child's considerations are built up from using concrete materials, but are independent of the actual material used. At this stage the child is eager and excited to learn. The teacher should therefore take the advantage and make use of the extreme eagerness to learn demonstrated by the pupils.

Children should be provided with concrete materials that can be made up into different collections according to different criteria. For instance counters, sticks and so on. Abstract concepts and ideas need to be presented very concretely (Anita, 2004). Children may be allowed to examine freely as many relations as possible among various variables in a learning situation. Since children prefer to talk and have much more facility in speech than in writing, they should be given opportunities to recite in class whether they know the right answer or not. However, the teacher should control class participation, so that pupils speak up only when called upon. This should provide a chance to all pupils and ensure that listening skill is also embraced. The teacher should reinforce pupil participation by using appropriate reinforcement cues, even if the answer is erroneous or irrelevant.

Upon discovering the power of words, many children may experiment with vulgar language. They know that they get a reaction although they do not understand exactly why. The teacher should first ignore the vulgar language in the hope that it will be dropped from lack of reinforcement. Alternatively, the teacher may have a short talk with the ringleaders or he may state that such words

are not pleasant to listen to and are not to be used.

At this stage, concepts of right and wrong begin to develop. Usually these are concerned with specific acts at first and only gradually become generalized. The idea of fairness becomes commonplace. To help children at this level gain a broader understanding of ethics, the teacher should discuss acts as they occur. He should do this by encouraging the pupils to think about why an act is good or bad. Children at this level are still moral realists, having difficulty comprehending the subtleties involved in various situations. If some pupils seem to be upset about what appears to be an inconsistency, the teacher might try to point out the circumstances which made necessary an adjustment in rules. Since the child sees rules as absolute, good judgment must be exercised by the teacher to prevent manipulation of the child's literal interpretation of rules. It is important that situations that permit social interaction should be always arranged. Advanced thinkers should be mixed with less mature thinkers, rather than using homogeneous grouping. The planned learning experiences should take into account the level of thinking attained by an individual or group.

Children should be encouraged to classify things on the basis of a single attribute before they are exposed to problems which involve relationships between two or more attributes. The teacher should ensure that pupils, particularly those with disadvantaged backgrounds understand such terms as "more", "less", "most" and "least".

Upper primary (formal operations) 11-15 years: standards V, VI, VII and VIII

At this stage the child shifts from the level of concrete operations to the final stage of formal operations. He is capable of considering the ideas of others and communicating with them, since he is well into the socialized speech phase of language development.

The development of adult patterns of thought involving logical, rational and abstract thinking characterizes this stage (Piaget, 1952). To concretize, pupils develop the ability to reason by hypotheses based on logic of all possible combinations. When the student has reached the stage of formal operations, he can construct theories and make logical deductions about their consequences without having had previous direct experience on the subject. He can deal with abstractions and mentally explore similarities and differences because he has mastered reversibility and decentration. He can think his way through understanding that the sweetness of water, when sugar is added, depends on the amount of water. At new problems, moving forward and backward, taking into account as many or as few qualities as seen relevant to him. In other words, new operational schemata appear capable of such tasks as: - combinational operation in general (combinations, permutations, aggregations);

proportion; mechanical equilibrium; understanding that the sweetness of water when sugar is added depends on the amount of water. At this level, the teacher should capitalize on children's almost incessant curiosity. Pupils can be encouraged to find answers themselves rather than the teacher always supplying them. However, if this is overdone, it can kill interest. A child who happens to know more or better than the teacher should be encouraged to contribute. Shifting from one interest to another does not necessarily mean lack of mental discipline (Anita, 2004).

Many upper primary students do set unrealistically high standards for themselves and tend to be perfectionists frequently. The inability to live up to such standards leads to feelings of frustration and guilt. Pupils should be taught to develop realistic levels of aspiration by having them start out doing simple tasks and working up to difficult ones. In doing so, such pupils do not only test their capabilities but also have some experience with success. The latter makes it easier for them to accept failure when they reach their limits. Upper primary children want to become independent, but at the same time they both want and need adult guidance and support. This ambivalence may cause disorganized, unpredictable, or in appropriate behavior which defies rational analysis. The teacher has to be as patient and understanding as possible when erratic behavior occurs. Since pupils at this level will at times function in concrete operations and at other times in formal operations, plenty of opportunities for all should be provided. These should be those that enable pupils to explain their thoughts, particularly with regard to abstractions. The teacher will thus be able to discern and take into account the level of awareness his pupils have reached on various ideas.

The students, particularly in classes 7 and 8, should learn to accept his abilities and talents. In these classes, such concepts as democracy, African socialism, may be introduced. Some students may come up with twisted interpretations of abstract concepts. To clarify such, the teacher has to be patient, sympathetic and open minded, and not to ridicule or categorically reject students' errors.

Although the attention span of upper primary students can be quite lengthy, there may be a tendency to daydream. Such detours into fantasy and dreams of glory probably take place because the students lack the real thing and also because their opportunities for excursions into fantasy are limited. To overcome this, students should be given assignments which challenge the imagination in as many ways as possible. Intriguing puzzles or problems should be presented as opposed to tedious drills (Anita, 2004). Assignments on themes like 'The kind of animal I would like to be if reincarnated' rather than on 'my pet,' useful dreams about the future – involving for example the kind of job the student might like, what is involved in getting the job, are also suggested.

The teacher should not take for granted the fact that

students at this level are thinking in the same way as he is thinking. He should try to be well informed on how his students interpret ideas which come up in class by encouraging free discussion. He should also watch for the tendency of the adolescent to indulge in unrestrained and unrealistic political theorizing. The teacher may handle such immature forms of thinking by helping students realize that they have overlooked certain considerations.

DISCUSSION OF THE IMPLICATIONS OF PIAGET'S THEORY OF INSTRUCTIONAL MANAGEMENT

Piaget's theory of cognitive development has far reaching implications for curriculum development, planning, implementation, evaluation and instructional management in schools. His levels of cognitive development may be used as broad and general guides to sequential curriculum planning. Curriculum planning revolves around the subject matter, the society and the learner. If we choose the subject matter to be our orientation in planning, then the structure of the content should be a sequence that is compatible with child development characteristics. Also, if society is chosen as the basis of the orientation of planning, then the content selected and organized should be around pertinent life situation confronted by students. When the orientation has the learner as a basis, then we must consider his interests, felt needs, basic urges or drives and concerns as he grows through the various stages. Thus the curriculum and instructional manager should be one that is diversified to call for the needs and interests of the many learners of varying ages, and abilities, which are found in the school. The objectives stated at the cognitive level, psychomotor and affective levels must reflect the different stages of the learner's growth. The scope, sequencing and integration of the subject matter have to relate to the learner's cognitive growth.

The teaching methodology and teaching materials, and the learning activities should be those that are appropriate to each of the cognitive developmental stages of the learners. Since the theory says that there is a mutual interaction between the learner and the environment, teaching materials should come from the learner's environment.

Teachers as instructional managers should use the hierarchy to: understand why children think and reason as they do; and to help the pupils master intellectual processes at the appropriate age. Children at various ages have different capacities for attention and comprehensive (save for a few lessons in physical education and the appreciation of aesthetic). This means for instance that a standard one pupil may not endure a seventy minute double period as would a standard seven. The theory clearly mandates that teachers as instructional managers should ensure that the learning

environment should be rich in physical (concrete) experiences because growth in any one stage depends upon activity. Indeed Piaget calls for an active school involvement, which is a key to intellectual development, and should include direct physical manipulation of objects. The child must touch, sequence and push to experience and understand his environment.

The curriculum, instructional and assignments developer should make a special effort to understand the child's world. They should not assume that what they think is good for the child is necessarily good for the child. They can then design educational experiences based on the child's need and readiness. By understanding how cognitive systems develop, they can avoid teaching children something before they are ready to learn it and missing a golden opportunity by waiting until well past the most sensitive moment.

Rather than trying to accelerate "slow learners" in order to catch up, educators should provide children with rich experiences at their stage of development. Teachers should use diagnosis to determine a child's stage of development and then design individualized instruction to provide the optimal amount of stimulation and challenge. In a Piagetian framework, an acceleration approach may result in superficial learning and not real learning. The former is acquisition of facts or responses restricted to a specific situation. The child thus learns laws for specific situations. He may correctly respond to a particular situation, but will be unable to generalize in novel situations.

Acquisition of a new structure of material operations (real learning) results from the equilibration process. Piaget demonstrates that this type of learning is the only stable and permanent one. It is only when the child has acquired the mental structure to assimilate new experiences that true learning takes place. It is only when the true learning has taken place that the child is able to generalize to novel situations. When the child has acquired the essential cognitive structures (schemas), he can begin to understand reality; but when the child does not have the schemas; new experiences have only a superficial effect. Therefore, unlike Bruner, Piaget feels that development does not occur as a result of learning, but true learning occurs primarily as a result of development. Thus, the curriculum developer should strive to present those experiences and materials that are relevant to what the child knows and then expose him gradually to novel situations.

Piaget believes that the equilibration process is the driving force in influencing the person to move from one level to a higher level of cognitive development. Social and physical environments can be modified to influence equilibration. A stimulating environment plays an important role in the manifestation of cognitive ability because it will provide disequilibrium, thus forcing the mind to assimilate new information and formulate new schemes. Understanding of the equilibration process will guide

curriculum developers and instructional managers in their interaction with children. Teachers should not provide children with information and expect an immediate response or change in behavior.

Piaget cautions that assimilation and accommodation take time. It should be remembered that the child may be involved in some activity today, but the change in his schemes may not occur until sometimes in the future when he has had further experiences. These experiences may provide further information and clarification to make the accommodation process possible. This implies that the child should be allowed to “mess up” or to do “his thing”.

Piaget's theory is important in evaluating curriculum. He argues that teachers should understand that each individual child's cognitive development does not occur quickly and little, if any progress, may be assessed on a weekly or even monthly basis. They must not think that because something has been presented, it has been learned. He advises us to show care when presenting answers to children before they have had the chance to accommodate. His research suggests that children need time to “incubate ideas” in order to act on them. They should be given time to understand the school world which is different from the home world.

To assess the progress towards the attainment of the objectives of the curriculum that the teacher has to, at any time he chooses, focus his attention upon an individual child or small groups of children. In assessing pupils' program, the teacher should be guided by such questions as: - How little or how much of the curriculum does a pupil know at the beginning of the school year? What changes occur in the behavior of the pupil during and at the end of the school year? what are the individual learner's interests, aptitudes and achievements – at the

beginning, during and at the end of the instructional programme? And how effective are instructional methods for each individual learner? In a nutshell, Piaget emphasizes social interaction. Children must be involved in the learning process, that is, learning should be child-centred.

REFERENCES

- Anita W (2004) Educational Psychology. The Ohio state university Pearson Education, Inc.
- Elkind D (1969). Developmental studies of figurative perceptions in L.P Lipsitt and H.W Reege (Eds) Advances in child development and behavior Vol. 4 New York: Academic Press.
- Flavell JH (1963). The developmental Psychology of Jean Piaget. New York: Van Nostrand.
- Flavell JH (1977). Cognitive development. Englewood cliffs, NJ: Prentice – Hall.
- Hertherington, E.M and Parke, R.D (1975) child Psychology: A contemporary viewpoint. New York : MCGraw Hill.
- Meyer WJ, Dusek JB (1979). Child Psychology Developmental perspective Syracuse University: DC Health and company.
- O'Bryan KG, Boersma FJ (1971) Eye movements, Perceptual activity and conservation development. J. Exper. Child Psychol. 12PP. 157-169.
- Piaget J (1952). The origins of intelligence in children. New York: International Universities press.
- Piaget J (1994). Cognitive Development in children: Piaget Development and Learning, J. Res. in Sci. Teaching, 1964, 2: 176-186.
- Robert LH (1995). Classroom learning and teaching university of Kansas.

Full Length Research Paper

Factors in students' ability to connect school science with community and real-world life

K. O. Oloruntegbe¹, Adakole Ikpe² and J.D. Kukur³

¹Science and Technical Education, ³Social Science Education,
Adekunle Ajasin University, Akungba- Akoko, Ondo State, P.M.B 001, Nigeria.

²School of Science and Technology, National Open University of Nigeria, Victoria Island, Lagos, Nigeria.

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The ability to relate school and home science as a way of enhancing students' performance in chemistry prompted this investigation. 200 high school chemistry students drawn from an urban center in Ondo State, Nigeria constituted the sample. They were made to respond to validated structured questionnaire that sought to discover the ability of students to relate chemistry concepts they learned in school with those that could be observed or inferred from the activities they carry out daily at home and the effect of socio-economic background of the parents on students' ability to relate the two experiences. The results presented in tables as well as hypotheses tested with chi-square revealed that the students could not establish a helpful relationship between school and home science in spite of daily exposure to both experiences. Students from low socio-economic background, where there are no house helpers, and are involved in regular household chores struck a better relationship than their counterparts from high socio-economic background. Also, chemistry teachers do not cite these home experiences in their teaching. The study is useful for the science teachers, authors of textbooks, teachers' trainers and curriculum planners in improving the learning environment of chemistry students.

Key words: Chemistry concepts, home activities, socio-economic status and achievement.

INTRODUCTION

Chemistry is one of the most important branches of science. Careers in science and science based disciplines like engineering and medicine require that students who enroll in such disciplines must not only be good in chemistry but must pass the subject at least at credit level in the Senior Secondary School Examination (SSCE). Besides, chemistry enables learners to understand what happens around them. It helps them to solve simple problems they encounter daily. Fahmy (2000) states that the most interesting aspect of chemistry is that it apply to our daily lives. In order words, chemistry is a real life science subject.

Chemistry deals generally with change, structure and properties of matter. Many of the topics are generally

difficult for students to understand because of this. The difficulties arise from several sources. These include, as revealed in the work of some scholars, the abstract nature of concepts (Taber, 2002); curriculum demand (Swan, 2002); overload of students working memory space (Baddclay, 1999); and language and communication (Cassel and Johnstones, 1985; Gabal, 1999; Johnstone, 1984; Johnstones and Salepeng, 2001). The list of difficult chemistry concepts reported in the literature due to their abstract nature is a long one. The list includes atomic structure (Harrison and Treagust, 1996; Zoller, 1990); chemical bonding (Peterson and Treagust, 1989; Taber, 2002; Taber and Coll, 2003) and kinetic theory (Abraham et al., 1992; Stav, 1995; Taylor and Coll, 1989).

Of the many factors responsible for the difficulty, there is one that is worthy of being investigated. This is the inability of students to relate chemistry concepts learnt in

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

school to daily home activities, or better still, the inability of teachers to cite relevant home examples and illustrations while teaching. It may have been taken for granted that teachers and students would consolidate concepts taught and learnt in schools with home activities such as cooking in the kitchen, boiling water and mixing things. A few research evidences have revealed the opposite of this situation which have been taken for granted.

Learning is known to be culture dependent (Mwamwenda, 1996). Children who do not have the opportunity to engage in home activities, like cooking, may not have the first hand experiences through which they can acquire science concepts associated with such home activities. Hence, the gulf that exists between Science lessons in the school and home activities become wider. This gap, if not bridged by proper teaching, might hinder the ability of such students to relate these supporting experiences at home to school learning. As a result, many students see science as a discipline devoid of real life experiences. The main focus of this paper is to examine the influence of cultural backgrounds of students on their ability to relate chemistry concepts taught or learnt in school to home activities.

Literature review

A substantial number of researches have acknowledged the importance of parents, teachers and peers in the achievement of students in schools (Bugental and Johnston, 2000; Chang et al., 2001; Roehlkepartain, 2007; Jegede and Okebukola, 1989; Wolfram, 2005; Koul and Fisher, 2005). Cultural background and parental socio-economic status have been shown to have profound influence on school achievement. They are a major predictor of cognitive achievement (Bugental and Johnston, 2000; Chang et al., 2001; Roehlkepartain, 2007), they exert a very strong effect on students and determine their learning outcomes (Jegede and Okebukola, 1989; Wolfram, 2005). They also influence students' perception of teachers' interpersonal behaviour and classroom learning environment (Koul and Fisher, 2005). Wolfram (2005) established strong relationships between high socio-economic status of parents and better performance in students. On the other hand, Roehlkepartain (2007) and Rogoff (1995) observed a high risk of drop out of students in home disadvantaged environments and that low socio-economic status is negatively linked to a wide range of indicators of child and adolescent well-being.

However, a startling revelation was made by Pedrosa et al. (2006) of 'education resilience'. According to the authors, students coming from disadvantage backgrounds, in both educational and socio-economic aspects have a higher relative performance than their complementary group. This observation is startling because one would think that a disadvantaged background would

hinder performance and the subsequent advancement and enrollment for higher studies. Can it be there is something in such detractive environments that facilitates learning and achievement?

Characteristically, high socio-economic background has enhanced indices such as high standard living, educational attainment, high income and the ability to hire and pay for services such as cooking, cleaning and gardening, (Ainley and Long, 1995; Gwatkin et al., 2000; Vyas and Kumaranayake, 2006). Students from such homes are thus, left to face their studies in schools or at homes without distraction. The situation is not so in the lower income group. With meager income, many parents cannot afford the luxury of hiring helpers. They have to combine the household chores with the daily paid jobs. The children are not only involved in these domestic activities, in some cases, as it is in the third world, they contribute substantially to the family income either by selling in the market or working in the garden after school or at week ends. Deprived, as these environments may be of modern facilities, they could be rich in and promote indigenous and cultural activities through which children could learn meaningful science concepts.

Obviously learning takes place everywhere. Decades ago the cognitive scientists discovered and stressed the importance of environments in problem solving in learning. The study by Okebukola and Jegede (1991) revealed the negative influence of African traditional cosmology, beliefs and superstitions on students' acquisition of observational skill. However, those of Dansen (1984, 1988; Ohunche and Otaala (1981) and Mwamwenda and Mwamwenda (1989) made known the facilitating effects of domestic activities (selling, buying, gardening) on African children development of conservation ability, numeracy, concept formation and skill development. Generally females are known to possess better finger dexterity (Baenninger and Newcombe, 1995; Poole et al., 2005), perhaps due to their daily engagements in manipulative activities and household chores, while males develop better spatial orientation (Baenninger and Newcombe, 1989; Stumpf, 1998) and concepts due to their activities in gardens. Siggraph (2004) affirmed 'that simple scientific experiments can be conducted in the comfortable confines of the kitchen and the final result may be edible'. What an approach to science! However because students learn in a pleasant and comforting atmosphere, learning in the kitchen is not considered fashionable as the book approach to learning science. Difficult chemistry concepts such as radiation, convection, conduction, energy and chemistry of carbohydrates may seem overwhelming to many students, yet to explore and appreciate these scientific concepts during preparation of food may actually be a fun and exciting adventure. A list of some home activities that could promote the development of skills and formulation of scientific concepts is presented in Table 1. It is important that children engage in these household chores, for 'the chores may serve both the immediate goal of helping parents with

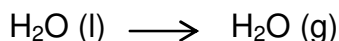
Table 1. Home activities that could promote the development of skills and formulation of scientific concepts.

Home environment	Home activities	Skills developed	Concept formulated
Kitchen	Lighting stove, burning of fuel	Measuring, observing noting observable change	Chemical change, physical change, compound, combustion, incomplete combustion, hydrocarbon, gases, liquids and solids
	Boiling of water	Measuring, , inferring, , predicting	Change of state, boiling, boiling point, evaporation, vapour pressure, atmospheric pressure etc
	Freezing and melting	Estimating size, observing	Freezing and melting points, solidification, contraction
	Dissolution of salts, sugar, oil etc in solvents	Measuring, observing, classifying	Solute, solvent, solution, mixture, residue, precipitate, suspension, colloidal solution, saturated and unsaturated solution, miscible and immiscible liquids, gels,
	Spraying insecticides	Estimating distance, predicting	Diffusion, gas volume and molecules, intermolecular space and force of attraction, entropy, compressibility, density
	Drying	Observing, measuring, classifying	Evaporation, surface area, volume-surface area, rate of reaction, radiation, heat energy,
Living room	Grinding and pounding	Observing, measuring,	Increasing surface area, reducing particle size, solid, paste,
Living room	Operating electrical appliances fans, pressing iron	Observing, counting, estimating time, communicating, reporting	Conversion, conservation of energy, revolution, rotation, potential and kinetic energies, oscillation
Garden	Measuring, planting, harvesting, applying fertilizers etc	Estimating planting time and distance, calculating, hypothesizing, controlling and manipulating variable les	Storage organs, corms, rhizomes, photosynthesis, translocation, irrigation, organic and inorganic compounds and solvents

Source: Ahiakwo (2007) and Oloruntegbe (2004) inaugural lecture and research article.

busy schedules to run the household, as well as the long-term goal of teaching children about family relationships and obligations and about planning and coordinating schedules and activities' (Goodnow, 1988). If the experiences are properly related so that one could consolidate the other, there is much a chemistry student can learn from home activities.

For instance, in boiling of water in a tin container in the kitchen, students would be made to know that water molecules are energetic and mobile, hence it can be poured.

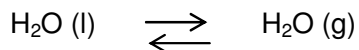


As the container is being heated on kerosene stove or electric/pressure cooker, the water molecules gain more energy such that molecules with high enough energy will

escape from the liquid phase into the gaseous phase. A vapour pressure will be built up. As more molecules move into the vapour phase (small volume) the vapour pressure increases (this can be inferred). The pressure would tend to force the lid of the container open to allow them to escape into a larger volume if not tightly closed (this can be observed from outside). At a time when the saturated vapour pressure inside is equal to the atmospheric pressure acting on the lid, the particles move freely to the gaseous phase and the water is said to boil (this can be inferred as well as observed). This is the point when the water is fit to make eba – cassava powdered meal (any eba made before this time will not be good). If the temperature is taken at this time it is likely to read 100 °C (this can be observed). This temperature is called the boiling point of water.

If the container is tightly closed to prevent particles from escaping (closed system – this may not be achieved

in the kitchen), on getting to the colder part under the lid the vapour will condense and drop back as liquid to the container (can be observed). The processes of boiling and condensation will continue until when equilibrium is established between water and vapour.



Look at the number of concepts that can be observed and inferred during the process of boiling water to make eba.

Further questions can be asked by the teachers to establish more links:

1. Why do liquid particles move and that of solid do not?
2. What causes the lid of water boiling container to move?
3. Why does water boil at different times but at the same temperature?
4. Would you expect the boiling water to completely dry up if heating continues?
5. How can you achieve a dynamic equilibrium between liquid and gaseous particles?

Questions of this sort could provoke more thinking in the students.

The list and the example provided above are not exhaustive. However, whether or not the experiences can be adequately related depends on the involvement of students in them, the ability of the parents to offer the necessary assistance and the teachers' competence and readiness in establishing a relation and making them strong. Parents' inculcation of cultural values is passed to the next generation through socialization (Rogoff, 1990; Bandura, 1997; Bussey and Bandura, 1999), how parents engage their children in science-related activities (Crowley and Callanan, 1998) and the language of discussion of conceptual questions and scientific vocabularies (Tenenbaum and Leaper, 2003) at home go a long way to determine children's ability to relate school science and home activities. Tenenbaum and Leaper submitted that causal explanations provide a cause-effect description of an event. Specifically the authors view few of them as eco-cultural factors. This investigation is on the influence of the factors on students' ability to relate school science and home activities.

Problem of the study

The main focus of this investigation is seeking a way of improving the learning environment of students in chemistry and enhancing their performance in skills and cognitive achievement through consolidated home activities. Students' interest in science could also be enhanced. This will forestall the dwindling enrollment of students into science and science based disciplines in universities and polytechnics. Lewis (1987) had long observed that young

ones are turning away from science; while Djallo (2004) and Duyilemi (2006) also raised alarm that science education is in danger of low patronage. Whereas graduates of social and management sciences get lucrative employment just like sportsmen and women, those in sciences are not so favoured. According to Djallo (2004), young people today are less interested in studying science and technology subjects than before. That they are opting for fields that pay better salaries and require less hard work. This is in spite of the current global race for science and technological advancement. At a time when the demand for scientific advances and innovation are needed, the number of graduates in science and technology has fallen (Djallo, 2004). One factor that seems to have facilitated the trend observed above is the tension created inadvertently between school and home science. Students no longer see science as a real life experience. The inability to relate these two complementary experiences makes chemistry to be difficult for students to understand, hence the need to arrest the students' dwindling interest in chemistry. This has inspired the current investigation into the influence of cultural background on students' ability to relate home experiences to the learning of chemistry.

Research questions

The research questions raised in the study are:

1. Is there any difference in the overall number of students that can relate chemistry concepts learnt in school to home activities and those who cannot?
2. Is there any difference in the number of students from low socio-economic families and high socio-economic ones who could relate chemistry concepts learnt in school to home activities?
3. Is there any difference in the number of students from low socio-economic families and high socio-economic ones who could not relate chemistry concepts learnt in school to home activities?
4. Do chemistry teachers cite relevant home examples and illustrations in their teaching?

Research hypotheses

Three hypotheses were formulated based on the questions raised above. They are:

1. There is no significant difference in the overall number of students that can relate chemistry concepts learnt in school with home activities and those that cannot?
2. There is no significant difference in the ability of students from high and low socio-economic status to relate chemistry concepts learnt in school with home activities.
3. There is no significant difference in the number of chemistry teachers as perceived by the students who

Table 2. Ability of students to relate chemistry concept to home activities.

Chemistry concepts	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Melting point	Boiling point	Filtration	Decantation	Saturated vapour pressure	Evaporation	Rusting
Able	56	47	68	41	43	27	19
Unable	144	153	132	159	157	173	181
	(8)	(9)	(10)	(11)	(12)	(13)	
	Corrosion	Alloy	Oxidation	Reduction	Condensation	Change of state	
Able	45	43	10	12	54	61	
Unable	155	157	190	188	146	139	

utilize home illustrations and examples in their teaching and those who do not.

METHODS

The research design employed in this study is survey research design. This is because only a very small proportion of the entire chemistry students' population was covered. 200 senior secondary school two (SSII) (Senior High School) students randomly selected from 10 senior secondary schools in Akure, Ondo State, Nigeria constituted the sample. They were gotten through simple random sampling using the class register.

Instrument, validation, data collection and analysis

A self-constructed validated structured questionnaire was used for data collection. The questionnaire consisted of four sections. The first section deals with the socio-economic status and home background of the students. Responses were sought on traditional variables, (Vyas and Kumaranayake, 2006), such as: father's income, mother's income, occupation of the father/mother, status of the father/mother on their jobs and the education of the father/mother. Other specifics range from asset ownership – piped borne water, electricity to whether parents have cooks, gardeners and cleaners at home or they carry out the household chores on their own. Respondents were also asked to indicate whether or not they join their parents in carrying out some of the household chores. The second section deals with what activities the students carry out when at home. Activities listed to be ticked by respondents include cooking which in turn involves boiling water; melting and freezing; evaporating; drying; making solution, laundry-drying, ironing, gardening and so on. In the third section, students were asked to indicate which of the 13 chemistry concepts presented they could relate with specific home activities. The concepts presented are melting point, boiling point, filtration, decantation, saturated vapour pressure, evaporation, rusting, corrosion, alloy, oxidation, reduction, condensation and change of state. It is the belief of the authors that the concepts listed here and the home activities listed in the second section are somehow related and that science students should be able to establish such relationship. In the fourth section, students were to indicate the home examples and illustrations they perceived that their teachers often referred to while teaching in chemistry classes. The instrument was validated using a team of science educators in the Faculty of Education of Adekunle Ajasin University, Akungba-Akoko. They went through the drafts and gave suggestions necessary for the preparation of the final draft. The final draft was subjected to a test-retest method in order to determine the coefficient of reliability. The coefficient was put at 0.74.

Data collected are presented in contingency tables and histogram. Chi-square was used to test the null hypotheses.

RESULTS

The responses of the students on the chemistry concepts they could relate to home activities are presented in Table 2. The evidences here and in other parts of the report are based on what the students reported they could do. No test instrument was designed and administered to test the actual ability of the students. The data in Table 2 clearly shows that the number of students who could not relate each concept with home activities was fewer than those who could relate the concept with home activities.

The socio-economic status of the parents of students who could relate the chemistry concepts with home activities is presented in Table 3. The data in Table 3 reveal that more students from low socio-economic home than from high socio-economic homes could relate each chemistry concept with home activities.

The socio-economic status of the parents of students who could not relate each concept with home activities is presented in Table 4. The data in Table 4 clearly show that for each chemistry concept, more students from high socio-economic homes, than from low socioeconomic ones could not relate the concept to home activities.

Chi-square statistic was used to analyze the data in Tables 2, 3 and 4 to test the first two null hypotheses. The analysis is presented in Table 5.

The analysis reveals that, for each dependent variable considered in the study, the value of chi square analysis is statistically significant. With respect to dependent variable 1, (shown in Table 5), the number of students who could relate chemistry concepts with home activities was significantly less ($\chi^2 = 125.83$ when compared with table value of 21.0 at degree of freedom (df) = 12 and $\alpha = 0.05$) than the number of students who could not. With respect to the influence of the socioeconomic status of parents on the ability of students to relate chemistry concepts with home activities, the number of students who could relate concepts with home activities was significantly higher ($\chi^2 = 112.78$ when compared with

Table 3. Socio economic status of students who could relate concepts with home activities.

Chemistry concepts	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Melting point	Boiling point	Filtration	Decantation	Saturated vapour pressure	Evaporation	Rusting
HSES	19	20	30	17	12	11	9
LSES	37	27	38	24	31	16	10
	(8)	(9)	(10)	(11)	(12)	(13)	
	Corrosion	Alloy	Oxidation	Reduction	Condensation	Change of state	
HSES	13	21	2	1	22	11	
LSES	32	22	8	11	32	50	

Table 4. Socio economic status of parents of students who could not relate chemistry concepts with home activities.

Chemistry concepts	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Melting point	Boiling point	Filtration	Decantation	Saturated vapour pressure	Evaporation	Rusting
HSES	108	134	130	125	135	153	132
LSES	36	19	2	34	22	20	49
	(8)	(9)	(10)	(11)	(12)	(13)	
	Corrosion	Alloy	Oxidation	Reduction	Condensation	Change of state	
HSES	109	142	151	143	134	119	
LSES	46	15	39	45	12	20	

Table 5. Chi square analysis on variables considered.

Variables considered	Degree of freedom	Calculated value	Table value	Remark
Ability or inability of students to relate chemistry concepts with home activities	12	125.83	21.0	*
Socio economic status of students who could relate concepts with home activities	12	112.78	21.0	*
Socio economic status of students who could not relate concepts with home activities	12	126.82	21.0	*

*Significant at $P < 0.05$.

table value of 21.0 at $df = 12$ and $\alpha = 0.05$) in low socioeconomic homes than those in high socioeconomic homes. Hypotheses 1 and 2 were rejected.

The response of the students on the ability of their teachers to refer to familiar home activities while teaching chemistry concepts is presented in Table 6. The data in Table 6 reveal that greater number of students indicated that their teachers were unable to make use of home activities in teaching chemistry concepts in the school. The chi-square analysis is significant, ($\chi^2 = 5.99$). This means that the difference in the number of students who indicated that their teachers often utilized activities in students' homes in teaching chemistry concepts in school is significantly less than those who indicated otherwise. The hypothesis 3 was rejected.

DISCUSSION

The finding that the bulk of the students reported they could not relate science concepts learnt in schools to home activities may be due to the wide gap that usually exists between the two family settings, homes where students participated in household chores and others where these activities are never engaged in by the students. Banu (1985) and Watanambe et al. (2007) once observed this trend. Both authors described as 'cultural mismatch' any comparison between home activities and school learning. Azmitia et al. (1994) highlighted the inability of chemistry teachers to cite home experiences in their teaching. This evidence is also revealed on Table 6 as many students claimed that their teachers do not

Table 6. Students' perception of teachers' use of home examples and illustrations in chemistry teaching.

Variables	Yes	No	Chi square analysis			
			Calculated value	Table value	Degree of freedom	Remark
Use of home activities	68	132				
Use familiar illustration	56	144	16.67	5.99	2	*
Use familiar language	87	113				

*Significant at $P < 0.05$.

cite relevant home experiences as examples and illustrations in teaching chemistry concepts.

There are more students from parents of high socio-economic level than those from low socio-economic homes who could not relate school and home science. This may be due to lack of involvement in household chores by the children whose parents prefer to hire house helps to do the job rather than allow the children to take part. However it need be noted that the performance of students may not follow this pattern, as the ability to relate these experiences are complementary and not a total factor of school achievement.

Conclusion and recommendations

In conclusion a substantial number of chemistry students could not establish a helpful relationship between school and home science in spite of daily exposure to both experiences. Also students from low socio-economic background, where there are no house helpers and are exposed to household chores struck a better relationship than their counterparts from high socio-economic background. This is not to say that their performance is better, but rather they could gain more especially if the teachers could cite these concepts related home activities in their teaching. Incidentally many chemistry teachers, as perceived by the students in the study, do not cite these home experiences in their teaching.

Socio-economic variables are very much beyond what the school management can manipulate. More attention is paid to the teachers' variable. Enhanced teaching strategies are advocated for meaningful learning through good school-home linkage practices. Teachers and students alike will do well to bring out salient chemistry – related home concepts in teaching and learning as illustrated in the example of boiling water in the literature review section.

This study has implication for science teachers, authors of textbooks, teachers' trainers and curriculum planners. Home activities can provide a veritable source of meaningful teaching and learning of science concepts. Parents must not see it out of place to engage their children in household chores; instead they should assist the children to learn from them. Teachers too must use students' home experiences to consolidate learning in school.

REFERENCES

- Abraham MR, Grybowski EB, Rennner JW, Marek EA (1992). Understan dings and misunderstandings of eight graders five chemistry concepts found in chemistry textbooks, *J. Res. in Sci. Teaching*, 29(2): 105-120
- Ainley J, Long M (1995). Measuring Student Socioeconomic Status. In Ainley J, Graetz B, Longand M, Batten M (Eds). *Socioeconomic Status and School Education*. P53-76, Canberra:AGPS.
- Azmitia M, Johnson B, Cooper CR, Lopez EM, Garcia E, Martinez-Chavez R, Lttel A, Rivera L (1994). Links between home and school among low-income Mexican-American and European-American families. Center for Research on Education, Diversity and Excellence, NCRCDCLI Educational Practice Report, University of California, Berkeley.
- Baddeley AD (1999). *Essentials of Human Memory*. Hove: Psychological.
- Baenninger, M, Newcombe N (1989). The role of experienceon spatial test performance A metaanalysis. *Sex Roles*, 20, 327-344
- Baenninger M, Newcombe N (1998). Environmental input to the development of sex-related differences in spatial and mathematics ability. *Learning nd Individual Difference*, 7, 363-379 .
- Bandura A (1990). *Multidimensional scales of perceived self-efficacy*. Stanford, CA; Stanford University
- Banu DP (1985). Science education in Nigerian secondary schools: a reappraisal, *J. Sci. Teachers Association of Nigeria*,22, 1 and 2,39-44
- family. *Annual Review of psychology*,51, 315-344
- Bussey K, Bandura A (1999), Social cognitive theory of gender development and differentiation. *Psychological Review*, 106: 676-713
- Cassel JRT, Johnston AH (1985). *Words That Matter in Science*. London: The Chemical Society .
- Crowley K, Callanan MA (1998). Describing and supporting collaborative scientific thinking in parent-child interactions. *Journal of Museum Education*, 23, 12-17
- Djallo AB (2004). Science Education in Danger. *Education for Today*Yhe Newsletter of UNESCO's Education Sector, No 11
- Fahmy AFM (2000). Systematic approach to teaching and learning chemistry for 21st century. 16th internatiinal Conference on Chemical Education: rkshop on New Trend in Chemistry. Budapest, Hungary, August 5-10, 2000. Fahmy@online.com.eg
- Gabel DL (1999). Improving teaching and learning through chemistry education research: a look to the future, *Journal of Chemical Education*, 76 4, 548-554
- Goodnow JJ(1988). Children's household work: Its nature and functions, *Psychological BULLETIN*, 103: 5-26.
- Gwatkin DR, Rustein S, Johnson K (2002). Socioeconomic Differences in Nigeria. Health, Nutritionand Population in Nigeria. Washington DC HNP/Poverty Thematic Group of the World Bank online at [http://www.worldbank.org/poverty/health/data/index.htm#lcr]
- Harrison AG, Treagust DE (1996). Secondary students mental model of atoms and molecules: implication for teaching chemistry, *Science Education*, 80, 5, 509-534.
- Jegade OJ, Okebukola PA (1989). Some socio-cultural factors militating against drift towards science and technology in secondary schools. *Research in Science and Technological Education*. 7, 2, 141-151
- Johnston AH (1984). New stars for the teachers to steer by? *J. Chemical Educ.*, 61, 10, 847-849.
- Johnston AH, Selepeng D (2001). A Language Problem Re-visited, *Chemistry Education: Rresearch and Practice in Europe (CERAPIE)*,

- 2,1 19-29.
- Mwamwenda TS (1996). Education al Psychology An African Perspective. Natal: Pietemaritzburg, Butterworth Publisheers, 107-145.
- Mwanwemda TS, Mwaanwenda BB (1989). Formal operational thought among African and Canadian college students. Psychological Report, 64, 43-46.
- Ohunche RD, Otaala B (1981). The Afrfrican Child and his Enviroment. NewYork: Pergamon press.
- Okebukola PA, Jegede OJ (1991). The relationship between African traditional cosmology and students acquisition of a science process skill, *Int. J. Sci. Educ.* 13(1): 37-47.
- Pedrosa HLR, Dachs NW, Maia RP, Andrade CY, Carvalho BS (2006). Educational and Socioeconomic Background of Undergraduates and Academic Performance: Consequences for Affirmative Action Programs at a Brazilian Research University. A paper presented at the IMHE/OECD General Conference, Paris, September 2006
- Peterson RF, Treagust DF (1989). Grade-12 Students concept of covalent bond and structure. *J. Chem.I.* 66(6): 459-460.
- Poole,J, Busther PA, Torres AT, McMullen CK, Markhan A, Mariam ML, Anderson JB, Qualls C (2005). Measuring dexterity in children using the nine-hole peg test. *J. Hand Therapy*, 13, 8
- Roehkepatain, E.C. (2007). Service-Learning with Disadvantaged Youth, Scotts Valley, CA: Learnand Serve America' National Service-Learning Clearinghouse, 2007.
- Rogoff B (1995). Observing sociocultural activity in three planes; Participatory apprpriation, guided participation and apprenticeship. In Wertsch P, Del Rio, Alvarez A (Eds), *Sociocultural studies of mind* (pp 139-164), New York: Cambridge University Press.
- Stavy R (1995). *Learning Science in the Schools* (Hillsdale NJ: Research Informing Practice: Lawrence Erlbaum), 131-154.
- Stumpf H (1998). Gender-related differences in academically talented students' scores and use of time on test of spatial ability. *Gifted Child Quaterly*, 42(3): 157-171.
- Taber, K.S., (2002). *Alternative Conceptions in Chemistry: Prevention, Diagnosis and Cure?* London: The Royal Society of Chemistry.:
- Taber KS, Coll RK (2003). Bonding. In Gilbert JK, De Jong O, Justi R Treagust DF, Van Driel JH (Eds), *Chemical Education Towards Research- Based Practice* Dordrecht: Kluwer.
- Tennbaum HR, Leaper C (2003). Parent-child conservations about science: the socialization of gender in equities. *Developmental Psychology*, 39, 1 34-47
- Vyas S, Kumaranayake L (2006). Constructing Socioeconomic Status Indices: How to Use Principal Components Analysis. *Health, Policy and Planning*, 21(6): 459-468
- 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, 2005).
- Zoller U (1990). Students misunderstanding and alternative conceptions in college freshman chemistry (General and Organic), *J. Res in Science Teaching*, 27(10): 1053-1065.

Full Length Research Paper

Establishing quality assurance in Nigerian education system: Implication for educational managers

Sunday O. Adegbesan

National Institute for Educational Planning And Administration (NIEPA), Akure, Ondo State, Nigeria.
E-mail: gbesco2001@yahoo.com. Tel: 08036783695.

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The importance of quality education in nation building cannot be over emphasized. There have been several calls on the educational managers on how to make the educational system to be more vibrant in the quality of its products after several quantity of mass failure and half baked products from our various educational institutions in the country. These over the years have generated a lot of debate and argument among Nigerians on the newspapers, radio and television programmed, including parent's religious bodies and non governmental organizations. They often expressed their concern about the manner in which the system is losing its confidence as regards to the effective and efficient nature of the system. However, this paper therefore, discusses the role of educational managers in assuring quality in the Nigerian education system. Consequently, the paper looks at the concept of quality assurance and strategies for establishing quality assurance in education and finally it also examines Educational managers' role in assuring quality in Nigeria education system.

Key words: Quality control, quality assurance, educational managers, educational system.

INTRODUCTION

Education has been described as the bedrock of every society and tool for nation building. For qualitative education to be achieved in a nation the principal actors of learning who are the teachers, learners and the environment must be cooperatively organized. In other words, the teacher must be adequate in quality and quantity, the students must be well trained and facilities must be provided as well. In recent time, the upspring and rapid establishment of private schools and institution in Nigeria is as a result of lack of confidence the Nigeria's education system which has adverse effect in the development of the nation.

Adepoju (1999) was right when he implied that, people and nations are what they are because of the nature and types of education they have been exposed to. However,

the modern view, even where only lip service is being paid to it, is that, quality education is the right of every citizen, not a privileged that the rulers may grant or withhold. This, view has been given greater urgency by demands of the modern industrialized and technological age. Education today must have the effect of making it possible for a country to have a steady supply of highly creative citizens who help to keep improving the living conditions of the general citizenry, and to solve the existential problems that are thrown up from time to time. Such problems are now being further and it is complicated by the theory and reality of the so-called global village.

As is well known, the problem that government has is in reconciling access with quality in the provision of education. But, it is abnormal to describe education as anything that lacks quality. (Yoloye, 2005) agrees that quality must characterize education at every stage and the real problem that governments have to face is deciding the mix of levels, of how many of its citizens must go beyond the basic education and how many must have

Abbreviation: SMOE, State ministries of education; SUBEB, state universal basic education board; LGUBEA, local government universal basic educational authority.

higher education? What goes on in Nigeria primary and secondary schools today bears little resemblance to the situation first described. One seldom hears of inspectors of education today at least of the variety which actually goes round and ensures good standards in primary and secondary schools.

It was claimed that, it is partly because they are now many more schools, but this need not to be so. The real reason is that, particularly after their ill-advised taken over all primary and secondary schools by the government of the federation. Education has become bureaucratized and subjected to the unenterprising attitude of the Nigerian Public Service. It is doubtful, if children in schools today have seen an inspector visit their schools. That is why today many primary and secondary schools are in fact turning into shopping malls. The learning environment has equally woefully deteriorated many so-called primary schools that have no furniture, in many cases even no doors or windows, and all in such hideous structures. Little wonder, then, that all those who can afford it give the government school a wide berth, a trend which is now raising the cry of commercialization of education in the country.

NEED FOR QUALITY ASSURANCE IN NIGERIAN SCHOOL

The need for quality assurance in Nigerian schools cannot be overemphasized in order to ensure quality of teaching and learning. However, the following are the major needs of quality assurance in our education system in Nigeria:

- (i) To serve as indispensable component of quality control strategy in education.
- (ii) To ensure and maintain high standard of education at all levels.
- (iii) To assist in monitoring and supervision of education,
- (iv) To determine the quality of the teacher input.
- (v) To determine the number of classrooms needed based on the average class size to ensure quality control of education.
- (vi) To determine the level of adequacy of the facilities available for quality control.
- (vii) It would ensure how the financial resources available could be prudently and judiciously utilized.

QUALITY AND QUALITY ASSURANCE IN EDUCATION

The concern for quality has been at the core of the motivating forces for reforms in education. Ajayi and Adegbesan (2007) see quality as the total of the features of a process, product or service on its performance, in 'customers' or clients' perception of that performance. It

is not just a feature of a finished product or services but involves a focus on internal processes and outputs and includes the reduction of wasted and the improvement or productivity. Taking a cue from the above definition, Fadokun (2005) characterized quality by three interrelated and interdependent strands:

- (i) Efficiency in the meeting of its goals.
- (ii) Relevance to human and environmental conditions and needs.
- (iii) Something more" that is the exploration of new ideas, the pursuit of excellence and encouragement of creativity.

With regards to education, the international institute for educational planning (IIEP) views quality from different perspectives. The first is from the internal criteria of the system such as profile expiration and the external criteria which are the fitness and relevance of such an education to its environment.

Arikewuyo (2004) views quality in education to be judged by both its ability to enable the students performs well in standard examinations and relevance to the needs of the students, community, and the society as a whole. He finally concluded that quality serves as determination of gradations based on standard of excellence beneath which a mark of inferiority is imposed or adduced and above which grades of superiority are defined. However, quality assurance is related to quality control, but it functions in a rather proactive manner in the sense that quality control serves as series of operational techniques and activities used to fulfill that requirement are met. While, quality assurance goes beyond that, because it extends the focus from outcomes or outputs to the process which produces them.

Similarly, Ajayi and Adegbesan (2007) argue that, quality assurance is related to accountability both of which are concerned with maximizing the effectiveness and efficiency of educational systems and services in relation to their contexts, of their missions and their stated objectives. In his own definitions, Ehindero (2004) says quality assurance focused on the:

- (i) Learners entry behaviours, characteristics and attributes including some demographic factors that can inhibit or facilitate their learning.
- (ii) The teacher entry qualification, values pedagogic stalls, professional preparedness, subject background, philosophical orientation etc.
- (iii) The teaching / learning processes including the structure of the curriculum and learning environment.
- (iv) The outcomes, which are defined for different levels in terms of knowledge, skills and attitudes including appropriate and relevant instruments to assess these objectives.

Finally, Fadokun (2005) sums the definition of quality

Table 1. The teachers in the sampled schools are professional qualified.

Qualification	Males	Females	Total	Female ratio (%)
B.Ed	664	524	1188	44.1
B.Sc	418	118	536	22.0
B.Sc with Educ.	439	279	718	38.9
MSC / MED	106	63	169	37.3
NCE Tech	668	444	1112	39.9
ND / OND with Educ	167	82	249	32.9
HND with Educ.	281	88	286	30.8
Total	27616	1589	4305	36.9

Source: FME, Abuja ESA Report (2005). Adapted from Ojedele (2007).

assurance in education as a programmed, an institution or a whole education system. In such case, quality assurance is all these attitudes, objectives, actions and procedures that through their existence and use, and together with quality control activities, ensure that appropriate academic standards are being maintained and enhanced in and by each programmed.

STRATEGIES FOR ESTABLISHING QUALITY ASSURANCE IN EDUCATION

The strategies used for quality assurance in education include:

(a) Monitoring: It refers to the process of collecting data at intervals about ongoing projects or programmed within the school system. The aim is to constantly assess the level of performance with a view of finding out how far a set objectives are being met (Ehinder, 2001).

(b) Evaluation: This is a formal process carried out within a school setting. It is based on available data which are used to form conclusions. It could be formative or summative. The aim of evaluation, a quality assurance strategy, is to see how the system can be assisted to improve on the present level of performance (formative) (Ijaiya, 2001).

(c) Supervision: Supervision might involve inspection, but it goes beyond inspection and includes attempt at bringing about improvement in the quality of instruction. It involves staff as essential part of the process. It is a way of advising, grinding, refreshing, encouraging and stimulating staff (Onocha, 2002).

(d) Inspection: Usually involves an assessment of available facilities and resources in an institution with a view to establishing how far a particular institution has met prescribed standards, it is more of an assessment rather than an improvement induced exercise (West-Burham, 1994).

(e) Quality control: The issue of quality control cannot be over-emphasized. It is one of the strategies for establishing quality assurance in the inferior education system at

all levels. Ojedele (2007) views that; quality control should be of concerns to the country in its drive towards technological development. For this to be successfully carried out, there is need to examine the qualification of teachers, teachers by gender, the adequacy of the curriculum, availability of equipment in the required number as well as the proper use of the processes involved in the various skills to ensure that the finished products are of high standard. On the qualification of teacher ESA 2005 findings show that about 16.7% of teachers in technical colleges for instances in the country have B.Sc. in addition to their professional qualification in education while 22.5 and 6.5% have NCE and HND in education to professional qualification in education, respectively. The overall study reveals that 76.7% of the teachers in the sampled schools are professional qualified (Table 1).

(f) Access and equity: Ojedele (2007) asserts that the trend of students transiting from the junior secondary school to other level of education has not been encouraging as it has been falling short of the expectation. He argued further that, the issue at the tertiary level presents a situation that calls for concerns in terms of variation in access at the Universities, Polytechnics and Colleges of education and in terms of gender disparity.

It is not a gain to say that Universities from time have been recording higher percentage in Joint Admission and Matriculation Board (JAMB) Examination than Polytechnics and Colleges of education in Nigeria. Table 2 shows the trends of admission

ROLE OF EDUCATIONAL MANAGERS IN ASSURING QUALITY IN NIGERIA EDUCATION SYSTEM

The roles of educational managers range from administrative to professional. Professional staff in the education industry should be concerned about how they manage the educational resources allocated to them for use as well as the control of their schools and students. The teacher's managerial functions by the same token should

Table 2. The trends of admission.

Institutions	Admission		Total (%)	Percentage (%)
	Male (%)	Female (%)		
Universities	57993(60.9)	37206(39.1)	95199(100)	74.30
Polytechnics	15444(64.5)	8508(35.5)	23952(100)	18.71
Colleges of Education	3542(39.7)	5421(60.3)	8963(100)	6.99
Total	76979	51135	12814	100

Source: FME Abuja Education sector Analysis Report (2005). Adapted from Ojedele (2007).

go beyond those of the beginning classroom teacher. He should be responsible not only to himself and his pupils but also to other staff members and their pupils. Not only that, he is faced with the responsibility of determining the priorities of management and the management style to be used for achieving qualitative educational results.

Arikewuyo (2004) had listed the following tasks which must be done by education managers in order to have a qualitative education these include:

1. Measurement and standardization of academic attainments.
2. Evaluation of quality of work during supervision,
3. Use of competent teachers and administrative / supervisory personnel.
4. Dissemination of information to teachers and students,
5. Use of educational technologies with a view to increasing the efficiency of teaching.
6. New research and development to invigorate all educational activities.
7. Guidance and counseling.
8. Placing students in suitable employment.
9. Efficient management of all education.

However, educational managers are classified by their functions that is, by the role they play in their position as managers. To fulfill our purpose of quality assurance in Nigerian education system, there is need to identify educational management as a body of systemized knowledge, based on general principles which are certifiable in terms of school of practice.

Ogunsaju (2006) argues that, a school manager may manage with good or bad judgment, with great or little experience, with exemplary or undesirable character traits, that educational management functions for quality assurance in our education systems may be practiced in similar terms by all kinds of people, in all kind of schools by educational managers. These are:

1. Planning: This is an essential aspect of good management. It requires the ability of the manager to look ahead and be able to formulate and select appropriate objectives and procedures to be followed within the school system.
2. Organizing: This is the ability of the managers to

create structural work. That is, he should focus attention on the structure and process of allocating tasks to achieve common objectives.

3. Staffing: This is another essential role of educational managers. It requires his ability to search for the right people and to place them on the right job both in quality and quantity which would reflect their experience and capability for the school objectives to be achieved.

4. Motivating: This is the energizing force behind all other activities of educational managers. Managers should know how to keep good morals of their workers in order to obtain maximum efficiency and effectiveness from them. This includes constant payment of salaries and other emoluments needed for their welfare.

5. Evaluating: This is the ability of managers to assess and know the outcome of the school aims and objectives. He ensures that, set down goals and objectives are achieved through quality control system which includes:

- (a) An effective quality school system.
- (b) Periodic audit of the operation of the system.
- (c) Periodic review of the school system to ensure it meets changing requirements.

Ogunsaju (2000) however, concluded that, for a school manager to perform his roles effectively in assuring quality in the school, he should be able to play these parts: be a listener, an encourager, a dissuader, a reporter, a watcher, a judge, a critic, a decision taker and on occasion of a model.

Achieving quality assurance in Nigerian education system

- (i) Education curriculum and standards of education in Nigeria should be reviewed to reflect the needs and aspiration of the society.
- (ii) There is need to harmonize the internal and external criteria of quality assurance raising standard of excellence of the education systems.
- (iii) There is need to improve or employ modern teaching methods and techniques in the classroom.
- (iv) A more developed and reformed curriculum content is highly desirable. There is also the need for curriculum

evaluation to allow innovations and new techniques/ methods to be incorporated.

(v) Effective supervisory system should be injected into the system.

(vi) Full professionalization of teaching in the country to set a standard under which a qualified and well trained teacher must operate is highly imperative.

(vii) Government should endeavour to properly fund education institutions in the country to meet the expectation of the society.

CONCLUSION

It is clear and evident that the educational managers' role in achieving quality education cannot be over emphasized. Nigeria's educational system is totally in shambles as inadequacies are the order of the day with human and material resources. Teachers are not employed on quality basis. Rather, they are now being employed on political basis.

Evaluations are not carried out by school managers in the State Ministries of Education, (SMOE), State Universal Basic Education Board (SUBEB) and Local Government Universal Basic Educational Authority (LGUBEA) even heads of schools are not concerned with the set-objectives of the school any longer, even enthusiasm in the community as to have schools at their door step in order to eradicate illiteracy is not there again and under these conditions, quality can never be assured. Therefore, an assurance process recognizes the need for a school to accept responsibility for its own management process. It is in this regard that the main difference between inspection and evaluation and assurance arises.

Assurance for quality education is a total holistic process concerned with ensuring integrity of outcomes. Thus, the responsibility for quality assurance rests with the schools' managers and this is expressed through its relationship with other stakeholders in the school system. Lastly, quality assurance recognizes the autonomy of educational institutions and seeks to enhance their capacity to operate in a responsive way.

REFERENCES

- Adepoju TL (1999). principles and practice of primary education in Nigeria, Ibadan corporate publications.
- Ajayi T, Adegbesan SO (2007). Quality assurance in the teaching profession. Paper presented at a forum on emerging issues in teaching professionalism in Nigeria (14-16 March) Akure, Ondo State.
- Arikewuyo MO (2004). Effective funding and quality assurance in the Nigerian education system. A paper presented at the 1st National Conference of the Institute of Education, Olabisi Onabanjo University, Ago-Iwoye Jan. pp. 12-15.
- Ehindero S (2001). The pitfalls of UPE and the need to enhance quality in the implementation of Universal Basic Education. Paper presented at the National workshop on Universal Basic Education (UBE) organized by the faculty of Education, University of Ilorin.
- Ehindero S (2004). Accountability and quality assurance in Nigerian education. Paper presented at the international conference of the Institute of Education, Olabisi Onabanjo University, Ago - Iwoye. (Jan 12th - 15th).
- Fadokun JB (2005). Educational assessment and quality assurance implication for principal instructional leadership roles. Paper presented at the 31st Annual Conference of International Association for Educational Assessment 4-9 September, Abuja.
- Ijaiya Y (2001). From quality control to quality assurance: A panacea for quality education in Nigeria schools. Paper presented at the third annual conference of the national association of educational administration and planning held at University of Benin.
- Ojedele PK (2007). Vocational and technical education in Nigeria: Issues and challenges. Paper presented at the international conference of the Nigerian association for educational management administration and planning (NAEP) held at University of Lagos (24-27 Sept.).
- Onocha CO (2002). Quality Assurance in teacher education. A discussion paper presented at the NTI's 25th anniversary celebration, Kaduna.
- Ogunsaju S (2006). School management and supervision. Ile-Ife: Cleanpnut Publishers.
- Ogunsaju S (2001). Nature and Purpose of educational management in Durosaro DO, Ogunsaju S (Eds) The craft of educational management. Ibadan: Reginason Book Publishers.
- Stern JD (1994). The condition of education in rural schools. Washington, D.C: US. Department of education, office of educational research and improvement.
- UNESCO (2000). The State of education in Nigeria, Abuja.
- West-Burham J (1994). Inspection, education and quality assurance, In: Bush T, West-Burham J. The principles of educational management. Leicester; Longman.
- Yoloye EA (2005). The relevance of Universal Basic Education in the development of primary education system in Nigeria in Adepoju TL (Ed) Planning and implementation of Universal Basic Education in Nigeria. Ibadan. Educational Industries Nigeria Limited.

Full Length Research Paper

Using IRT approach to detect gender biased items in public examinations: A case study from the Botswana junior certificate examination in Mathematics

O. O. Adedoyin

University of Botswana, Botswana. E-mail: omobola_adedoyin@yahoo.com. Tel: 002673555107 or 0026771429736.

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This is a quantitative study, which attempted to detect gender bias test items from the Botswana Junior Certificate Examination in mathematics. To detect gender bias test items, a randomly selected sample of 4000 students responses to mathematics paper 1 of the Botswana Junior Certificate examination were selected from 36,000 students who sat for the examination. Out of which 2,000 were males and 2000 were females. The examination paper consisted of 38 test items. To detect the gender biased test items, the study used 3PL (Multilog software) item response theory (IRT) statistical analysis. This generated the item characteristics curves (ICC for the two groups (male/female). The study compared the results generated from the ICC curves for the male and female groups, and found that, out of 16 test items that fitted the 3PL item response theory (IRT) statistical analysis, 5 items were gender biased.

Key words: IRT (item response theory), ICC (item characteristics curve).

INTRODUCTION

There has been a lot of research in educational measurement directed towards improving the fairness of tests/examinations across various subgroups of examinees, because important decisions are made based on test scores. A fair test is one that is comparably valid for all groups and individuals and that affords all examinees an equal opportunity to demonstrate the skills and knowledge which they have acquired and which are relevant to the test's purpose (Roever, 2005).

The presence of bias is a cause for concern because, tests are used as a gatekeeper for educational opportunities, and it is a very important issue that test items are fair for every examinee. Bias is the presence of some characteristic of an item that results in differential performance for individuals of the same ability but from different ethnic, sex, cultural or religious groups. Item bias can also be defined as invalidity or systematic error in how a test item measures a construct for the members of a particular group (Camilli and Shepard, 1994, p. 8). An examination item is considered biased if it functions differently for a specified subgroup of test-takers, in such a case, students who are equally able do not have an

equal chance of success (Zumbo, 1999). A biased item according to (Williams, 1997), measures attributes irrelevant to the test construct.

An item may be biased if it contains content or language that is differentially familiar to subgroups of examinees, or if the item structure or format is differentially difficult for subgroups of examinees. Content bias refers to situations where knowledge and or skills are not part of the educational background of the examinee. Lack of familiarity with content in test items disadvantages individuals in their performance. The individual's responses to items are not based on the appropriate ability level but on other wrong premises. Language bias occurs where words in the items have different or unfamiliar meanings for different examinee subgroups. Item structure and format bias occurs where there is ambiguity in the instructions, item stem or options. The content, or clues and explanations given to successfully complete the tasks provided disadvantage to individuals in some subgroups (Hambleton and Rodgers, 1995; Perrone, 2006).

To ensure that tests are fair for all examinees, most

large testing boards, organisation, have a formal review, which is part of the test development process, where items are screened by content specialist for text that might be inappropriate or unfair to relevant subgroups. The items are reviewed before field testing by content specialists as well as after field testing. The screening and the test development processes involves test developers and practicing teachers. After field trial, statistical measures are employed to identify items that are biased against a certain group of examinees, such test items are removed before the final set of test items are compiled. Item bias is of particular concern on tests of mathematics achievement where differences between males and females are commonly found (Kimball, 1989; Scheuneman and Grima, 1997). The failure to understand and account for gender differences on any test may lead to misinterpretations of the examination results.

Previously, a variety of methods had been used for detecting item biasness, e.g. the chi-squared method, the transformed item difficulty method, but recent interest in item response theory (IRT) in the measurement community has helped to assess differences in subgroup performance at the item level. IRT statistical analysis produces parameter estimates and item characteristics curves for each test item. Item characteristic curve method is a kind of detecting biased test items, which is based on item response theory. That is, item characteristic curve is used to compare the item characteristic curve difference between different groups. Under an IRT framework, a test item is biased if the ICC is not the same for various different groups, e.g. gender groups (boys and girls), who are equal in level on the latent trait do not have the same probability of endorsing a test item (Embretson and Reise, 2000).

The purpose of this study is to detect gender test items that are biased from the Botswana Junior Certificate test paper 1 in mathematics, IRT method of gender item bias detection will primarily focus on if there is any difference between the item characteristic curves of the male / female sub-groups. The results will shed light on the effective use of IRT approach in detecting biased test items for sub-groups based on gender, ethnic, race or culture from the population of all examinees.

The Botswana Junior Certificate (JC) examination is a national examination completely managed by the Botswana Examination Council (BEC). The current structure of education in Botswana is seven years of primary education, three years of junior secondary education, two years of senior education, and four years of university education (7+3+2+4). The Botswana Junior Certificate (JC) examination is administered at the end of the third year of the Junior Certificate (JC) course to measure the achievement level of candidates at that point. The examination is used for two purposes; as a tool to select students who are to proceed to the next level of education, which is the senior secondary, also as

an assessment mechanism that measures the extent to which basic competencies and skills have been acquired. For the three years of junior secondary school, students are required to take six core subjects and one optional subject. The core subjects are Setswana, English, Mathematics, Science, Social Studies and Agriculture. The optional subjects are Home Economics, Design and Technology, Religious and Moral education.

Item response theory

IRT is that the probability of answering an item correctly or of attaining a particular response level is modeled as a function of an individual's ability and the characteristics of the item. And a paramount goal of IRT is predicting the probability of an examinee of a given ability level responding correctly to an item of a particular difficulty. The latent traits can be measured on a transformable scale having a midpoint of zero, a unit measurement of one and arrange from negative infinity to positive infinity. While the theoretical range of ability is from negative infinity to positive infinity, practical considerations usually limit the range of values from -3 to +3 (Hambleton et al., 1991).

IRT begins with the proposition that an individual's response to a specific item or questions is determined by an unobserved mental attribute of the individual. Each of these underlying attributes, most often referred to as latent traits, is assumed to vary continuously along a single dimension usually designated by theta (θ) (Hambleton et al., 1991). There are traditionally three IRT mathematical equations termed; one, two, and three parameter models that are used to make predictions. The general, IRT framework encompasses a group of models and the applicability of each model in a particular situation depends on the nature of the test items and the viability of different theoretical assumptions about the test items. These models relate the characteristics of individuals and the characteristics of the items to the probability of a person with a given characteristics or level of an attribute choosing a correct response. For test items that are dichotomously scored, there are three IRT models, known as three-, two- and one- parameter IRT models. A primary distinction among the models is the number of parameter used to describe items. Although the one- parameter model is the simplest of the three models, it may be better to start from the most complex, the three-parameter IRT model.

The three parameter IRT model takes the following form:

$$P_i(\theta) = c_i + (1 - c_i) \frac{1}{1 + e^{-D_{a_i}(\theta - b_i)}} \quad (1)$$

Where c_i is the guessing factor, a_i is the item discrimination

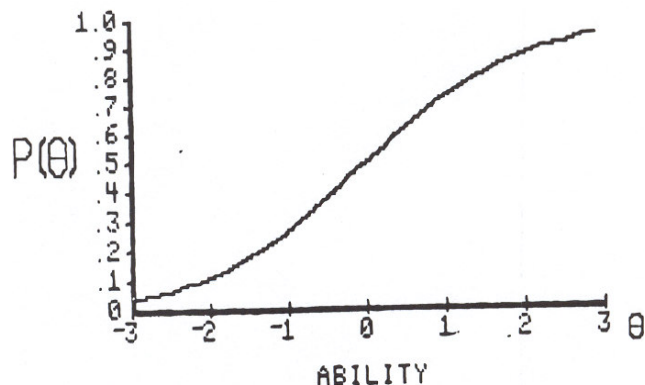


Figure 1. Example of item characteristics curve (ICC).

parameter commonly known as item slope, b_i is the item difficulty parameter commonly known as the item location parameter, D is the arbitrary constant (normally $D = 1.7$) and θ is the ability level of a particular examinee. The item location parameter is on the same scale of ability, Θ , and takes the value of Θ at the point at which an examinee with the ability-level θ has a 50/50 probability of answering the item correctly. The item discrimination parameter is the slope of the tangent line of the item characteristics curve at the point of the location parameter.

When the guessing factor is assumed or constrained to be zero ($c_i = 0$) the three-parameter model is reduced to the two-parameter model for which only item location and item slope parameters need to be estimated.

$$P_i(\theta) = \frac{1}{1 + e^{-D a_i (\theta - b_i)}} \quad (2)$$

If another restriction is imposed which stipulates that all items have equal and fixed discrimination, then a_i becomes a constant rather than a variable, and as such, this parameter does not require estimation, and the IRT model is further reduced to:

$$P_i(\theta) = \frac{1}{1 + e^{-D(\theta - b_i)}} \quad (3)$$

so, for the one-parameter IRT model, constraints have been imposed on two of the three possible item parameters, and item difficulty remains the only item parameter that needs to be estimated. The three-parameter model is the most general model, and the other two IRT models (two- and one-parameter models) can be considered as models nested or subsumed under the three-parameter model (Lord, 1980; Hambleton and

Swaminathan, 1985; Hambleton et al., 1991). The three IRT models are based on the logistic (cumulative) distribution function (Hambleton et al., 1991).

These logistic equations when graphed, produce plots that are called item characteristics curves (ICCs) (Figure 1). When ICCs are plotted the ability of the examinee is denoted by theta (θ) on the x-axis, while the probability of an examinee correctly answering the question is denoted by $P(\theta)$ on the y-axis. ICCs typically take the shape of an S-shaped curve called ogive (\int).

The probability of the correct response is near zero at the lowest levels of the trait and it increases to the highest levels of the traits where the probability of correct response approaches 1 (Hambleton et al., 1991). There are two technical properties that are used to describe ICC, the values of item difficulty and item discrimination. The value of item difficulty denoted by (b) is a location parameter, indicating the position of the item characteristics curve in relation to the ability that is required for an examinee to have a 50% chance of getting the item right. The item discrimination provides information on how well an item separates people with high and low ability levels.

The flatter the ICCs curve, the less the item is able to discriminate since the probability of correct response at the low ability levels is nearly the same as it is at high ability levels. The steeper the curve, the better the item can discriminate. The strongest utilization of IRT models have been in education, psychology and statistics fields primarily in instrument development and computerised adaptive testing. The growth in psychometrics, and computer adaptive testing in particular, has supported the growing interest in the use of IRT (Embretson and Reise, 2000). The backbone of IRT is the item characteristics curves produced for each test item. In using IRT to detect item bias, different ICC curves for each items / subgroups are produced for comparison.

In the context of large scale testing like the JC examinations, which is a national examination, the analysis of the scores of students is very essential in the production of student scores and grades, and in monitoring and evaluation of the quality of the test items for fairness within the country. In most of the African countries, Botswana inclusive, national examination are still analysed and interpreted using the classical test theory, which involves the use of the basic item analysis, like item difficulty, item discrimination and reliability coefficients. Apart from the common parameter estimates for analyzing tests/ examination scores, it is also necessary to assess differences in subgroup performance at the item level, commonly referred to as differential item functioning (DIF).

METHOD

The research population for this present study consisted of all students who sat for the Paper 1 of 2004 Botswana Junior secondary

school examinations in mathematics. The population of all students who sat for the Junior secondary school examination was thirty five thousand two hundred and sixty two (35, 262). Out of which 4000 students (2000 males and 2000 females) were randomly selected.

IRT (3PL) statistical method was used to analyse the responses from the different sub-groups (males/ females). The IRT statistical analyses produced parameter estimates for the two sub-groups and their corresponding Item characteristics curves. These item characteristics curves for the males and females groups were compared for gender item biased analysis.

The IRT model assumption

Unidimensionality is the most important assumption common for all IRT models. This assumption is sometimes empirically assessed by investigating whether or not a dormant factor exists among all the items of the test (Hambleton et al., 1991). The method used in this study for assessing the unidimensionality was performing exploratory factor analysis, principal component analysis with varimax rotation on the responses to the 38 items of Paper 1 Botswana JSS Certificate Examination in Mathematics using a sample size of 5000 examinees. This yielded five eigenvalues greater than 1. The first eigenvalue (5.718) was greater than the next four eigenvalues (1.781, 1.143, 1.012 and 1.004) (Table 1). The scree plot was plotted to guide in the determination of whether unidimensionality could be inferred (Figure 2). Unidimensionality was inferred because of the presence of a dominating factor, that is, a single underlying factor.

Determining the appropriate model for this study's data (the model FIT)

All applications of IRT assume that the model is correct. The utility of the IRT model is dependent upon the extent to which the model accurately reflects the data. The overall fit of the model to the data was examined using goodness of fit statistics to test if the items fitted the given IRT model. The one parameter model (1PL), two parameter model (2PL) and three parameter model (3PL) were used for the overall model fit. But the resulting approximate chi-square statistics for the goodness of fit, (Table 2), however, showed that only two items out of 38 items fitted the one parameter model, eleven items (11) fitted the two parameter model (2PL) and sixteen items (16) fitted the three parameter model. The results of goodness of fit indicated that the data fitted the two and three parameter IRT models.

With the result of the goodness of fit analysis, the 3PL model was used for the item parameter estimates of the 16 items and for the item characteristics curves. The items are numbers (1, 2, 3, 4, 5, 12, 15, 16, 21, 22, 23, 30, 31, 34, 37, 38).

RESULTS

Table 3, summaries the results for male/female students item parameter estimates from the generated item characteristics curves, for the following items (1, 2, 3, 4, 5, 12, 15, 16, 21, 22, 23, 30, 31, 34, 37 and 38). Out of the sixteen items the following eleven (11) items were non significant (1,4, 5, 16, 21, 22, 23, 30, 34 37 and 38), and five items were significant (2, 3, 12, 15, 31) because the item characteristics curves for both the male and female were different, which shows that these items were gender biased towards a particular group.

DISCUSSIONS

From the item characteristics curves for both male and female groups, the most obvious test items that exhibited gender test items bias were five (item numbers 2, 3, 12, 15, 31). The item characteristics curves for the five identified test items were not the same for both male and female groups, which means that the five test items were gender biased.

Item 2

Both the male and female item characteristics curves (ICC) shifted vertically up due to high guessing factor (male $c=0.438$ and female $c=0.569$) but it is more pronounced in the female group than the male group. This represents an easy item because of the probability of correct response is high for the low ability examinees due to guessing factor. The two item characteristics curves are not identical, which shows that item 2 is biased towards a male group, due to the fact that the female group can answer the question by guessing (Figure 3).

Item 3

For item 3, the two item characteristics curves are not identical, since the ICC for the female group shifted towards the right, and the guessing value $c=0.199$ is higher than the male group of $c=0.093$. This is a difficult item for both the male / female examinees, but more difficult for the female examinees due to the fact that the probability of correct response is low for most of the ability scale and it increases only at the high ability levels. This item was biased towards the female group (Figure 4).

Item 12

The ICC curves for the male and female groups are not the same, the two curves shifted up, more pronounced in the female than the male group. The test item was a bit easier for the female group than the male group. Looking at the two ICC curves, the item was biased towards the male group. While this item is easy for the female groups, but a bit difficult for the male group (Figure 5).

Item 15

Item 15 was easier for the males than the females. The low ability group in the male group has a high probability of correct response than the low ability female group. The female item characteristics curve shifted towards the right

Table 1. Total variance explained by the result of factor analysis.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	5.718	15.046	15.046	5.718	15.046	15.046	3.756	9.884	9.884
2	1.781	4.688	19.734	1.781	4.688	19.734	3.216	8.462	18.347
3	1.143	3.007	22.741	1.143	3.007	22.741	1.458	3.837	22.183
4	1.012	2.662	25.404	1.012	2.662	25.404	1.151	3.030	25.213
5	1.004	2.643	28.047	1.004	2.643	28.047	1.077	2.834	28.047
6	0.997	2.623	30.670						
7	0.986	2.595	33.266						
8	0.955	2.514	35.780						
9	0.950	2.499	38.279						
10	0.935	2.460	40.739						
11	0.925	2.434	43.172						
12	0.919	2.418	45.590						
13	0.910	2.395	47.985						
14	0.896	2.359	50.344						
15	0.887	2.333	52.677						
16	0.882	2.321	54.998						
17	0.875	2.302	57.299						
18	0.867	2.282	59.581						
19	0.855	2.251	61.833						
20	0.845	2.224	64.056						
21	0.838	2.205	66.261						
22	0.834	2.195	68.456						
23	0.822	2.164	70.620						
24	0.816	2.146	72.766						
25	0.813	2.140	74.906						
26	0.810	2.133	77.039						
27	0.805	2.118	79.157						
28	0.791	2.080	81.237						
29	0.782	2.057	83.294						
30	0.777	2.044	85.338						
31	0.755	1.987	87.325						
32	0.742	1.953	89.278						
33	0.726	1.912	91.190						
34	0.706	1.857	93.047						

Table 1. Contd.

35	0.679	1.786	94.833
36	0.675	1.777	96.610
37	0.672	1.768	98.378
38	0.617	1.622	100.000

Scree Plot

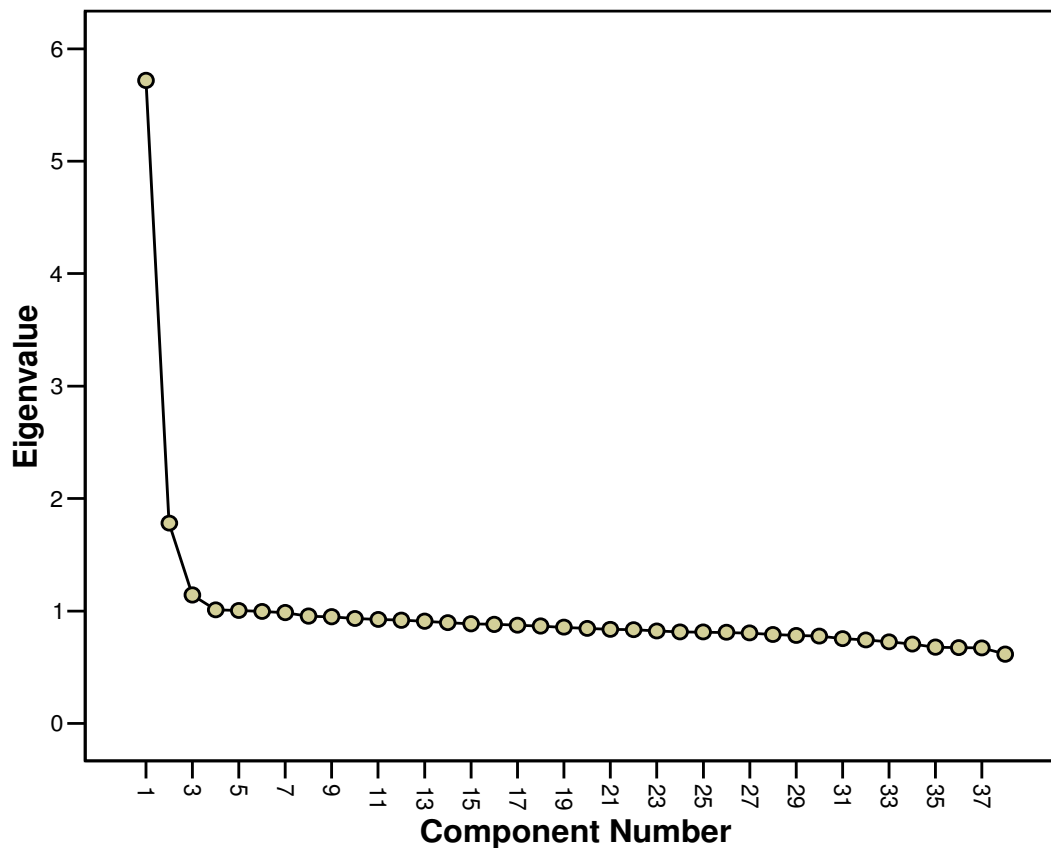


Figure 2. Scree plot of eigenvalue.

Table 2. Results of chi-square statistics for 1PL, 2PL and 3PL IRT models.

Items	1PL			2PL			3PL		
	Chi-square	df	p	Chi-square	df	p	Chi-square	df	P
1	201.4	8.0	0.0000	12.6	9.0	0.1796**	8.1	9.0	0.5271**
2	179.5	8.0	0.0000	19.3	9.0	0.2310**	11.4	9.0	0.2480**
3	215.5	8.0	0.0000	15.4	9.0	0.0817**	14.0	9.0	0.1220**
4	121.5	9.0	0.0000	16.6	9.0	0.0554**	18.4	9.0	0.0308**
5	23.3	9.0	0.0057	16.7	9.0	0.0537**	13.6	9.0	0.1370**
6	324.6	9.0	0.0000	57.5	8.0	0.0000	52.9	9.0	0.0000
7	296.4	9.0	0.0000	80.6	8.0	0.0000	76.7	8.0	0.0000
8	227	9.0	0.0000	53.5	9.0	0.0000	36.3	9.0	0.0000
9	96.2	9.0	0.0000	29.0	9.0	0.0006	29.7	9.0	0.0005
10	528.4	9.0	0.0000	78.2	9.0	0.0000	50.2	8.0	0.0000
11	310.1	9.0	0.0000	28.5	8.0	0.0004	24.6	9.0	0.0034
12	80.7	9.0	0.0000	12.2	9.0	0.2017**	14.1	9.0	0.1178**
13	78.9	9.0	0.0000	21.3	9.0	0.0115	7.7	9.0	0.0017
14	257.7	8.0	0.0000	57.3	7.0	0.0000	51.3	8.0	0.0000
15	6.9	9.0	0.6435**	6.3	9.0	0.7136**	8.7	9.0	0.4644**
16	75.1	9.0	0.0000	32.4	9.0	0.0002	8.4	9.0	0.4985**
17	31.8	8.0	0.0001	30.8	8.0	0.0002	31.5	9.0	0.0002
18	308.2	9.0	0.0000	79.3	7.0	0.0000	81.6	8.0	0.0000
19	94.1	9	0.0000	62.8	9.0	0.0000	62.0	9.0	0.0000
20	86.0	9.0	0.0000	73.0	9.0	0.0000	29.1	9.0	0.0006
21	34.4	8.0	0.0000	4.7	9.0	0.8612**	14.4	9.0	0.1084**
22	43.8	9.0	0.0000	7.7	9.0	0.5691**	13.8	9.0	0.1312**
23	20.0	9.0	0.0178	30.8	9.0	0.0003	10.9	9.0	0.2843**
24	105.6	9.0	0.0000	47.1	9.0	0.0000	34.7	9.0	0.0001
25	107.0	8.0	0.0000	125.0	9.0	0.0000	25.1	9.0	0.0028
26	27.2	9.0	0.0013	12.2	9.0	0.0003	21.2	9.0	0.0005
27	132.6	9.0	0.0000	111.4	8.0	0.0000	14.7	9.0	0.0001
28	24.7	9.0	0.0033	7.1	9.0	0.0002	8.5	9.0	0.0004
29	223.9	8.0	0.0000	81.6	9.0	0.0000	35.4	9.0	0.0001
30	17.3	9.0	0.0446	22.1	9.0	0.0087	13.3	9.0	0.1507**
31	59.4	9.0	0.0000	33.7	9.0	0.0001	15.5	9.0	0.0770**
32	366.6	9.0	0.0000	59.5	8.0	0.0000	34.5	9.0	0.0001
33	154.2	9.0	0.0000	62.0	9.0	0.0000	74.3	9.0	0.0000
34	440.2	9.0	0.0000	17.8	9.0	0.0373**	10.6	9.0	0.3068**
35	151.4	9.0	0.0000	105.0	9.0	0.0000	47.6	9.0	0.0000
36	259.5	9.0	0.0000	234.8	9.0	0.0000	104.0	9.0	0.0000
37	11.6	9.0	0.2353**	14.2	9.0	0.1156**	6.0	9.0	0.7436**
38	146.8	8.0	0.0000	27.9	8.0	0.0005	9.7	9.0	0.3773**

** The items selected with probability greater than the alpha level of 0.05 significant level.

Table 3. Summary of all non significant results for male /female students

items	Item discrimination (a)	Item difficulty (b)	Guessing parameter (c)
Item 1			
Males	1.053	0.220	0.216
Females	0.780	0.294	0.183
Item 2			
Males	0.887	-0.028	0.438 ***
Females	0.883	0.141	0.569
Item 3			
Males	1.345	0.320	0.093 ***
Females	1.495	0.501	0.199
Item 4			
Males	1.123	1.310	0.000
Females	1.217	1.213	0.104
Item 5			
Males	1.151	0.946	0.208
Females	1.028	1.253	0.149
Item 12			
Males	0.755	-0.689	0.244 ***
Females	0.859	-0.986	0.289
Item 15			
Males	1.015	-1.341	0.001 ***
Females	0.861	-1.586	0.000
Item 16			
Males	0.681	-1.954	0.001
Females	0.697	-2.329	0.000
Item 21			
Males	0.676	-0.415	0.000
Females	0.606	-0.914	0.000

Table 3. Contd.

Item 22				
Males	2.049	1.506	0.168	
Females	1.770	1.580	0.131	
Item 23				
Males	0.839	0.155	0.311	
Females	0.844	0.417	0.426	
Item 30				
Males	1.906	1.448	0.578	
Females	1.547	1.474	0.550	
Item 31				
Males	1.793	2.186	0.424***	
Females	-0.026	-24.300	0.252	
Item 34				
Males	0.859	0.779	0.250	
Females	1.062	0.938	0.304	
Item 37				
Males	0.752	-0.634	0.000	
Females	0.692	-0.255	0.018	
Item 38				
Males	2.243	2.050	0.185	
Females	1.562	2.228	0.142	

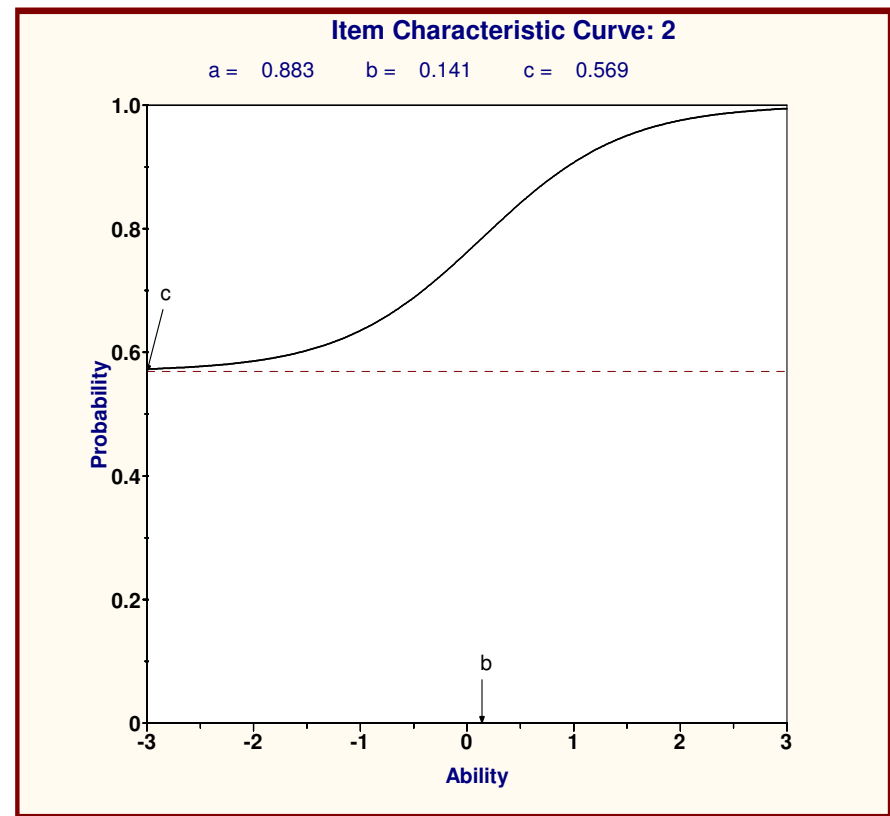
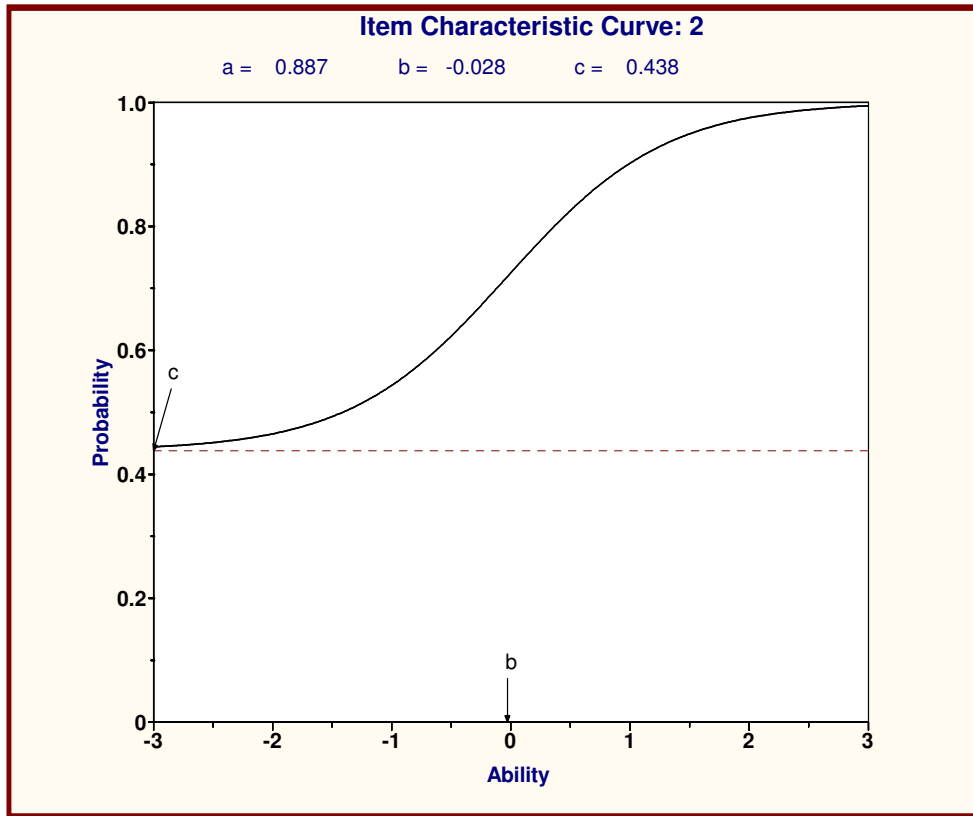
*** Significant items that were gender biased.

that is the probability of correct response is low for most of the ability scale and it increases only at the high ability levels. The guessing parameter for the female group was also higher than the male group. This item was biased towards the female group (Figure 6).

Item 31

The most obvious test item that exhibited test bias was item number 31, the item discrimination value for the male sub-group $a = 1.793$, item difficulty value $b = 2.186$ and the guessing value $c = 0.424$,

whereas the item discrimination value for the female sub-group $a = -0.026$, item difficulty value $b = -24.300$, and the guessing value $c = 0.252$. It shows that this test item was very difficult for both groups (male/female) but more difficult for the female examinees than the male examinees. The



3 Parameter Logistic Model Item: 2
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

3 Parameter Logistic Model Item: 2
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

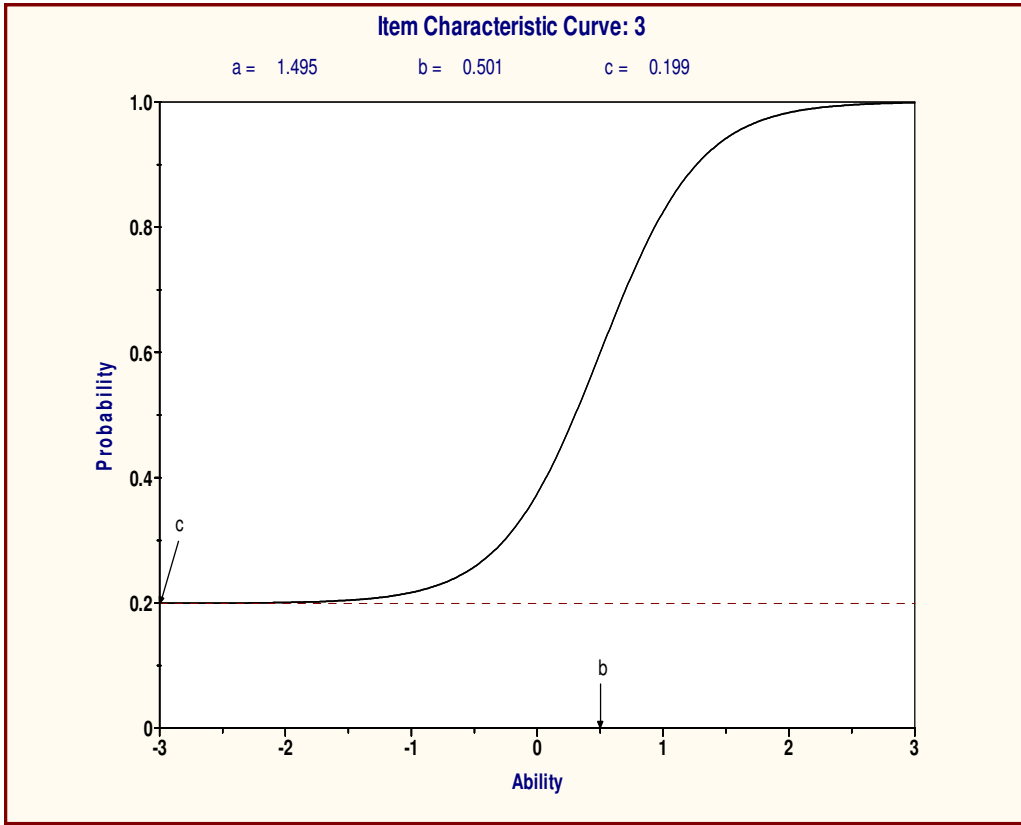
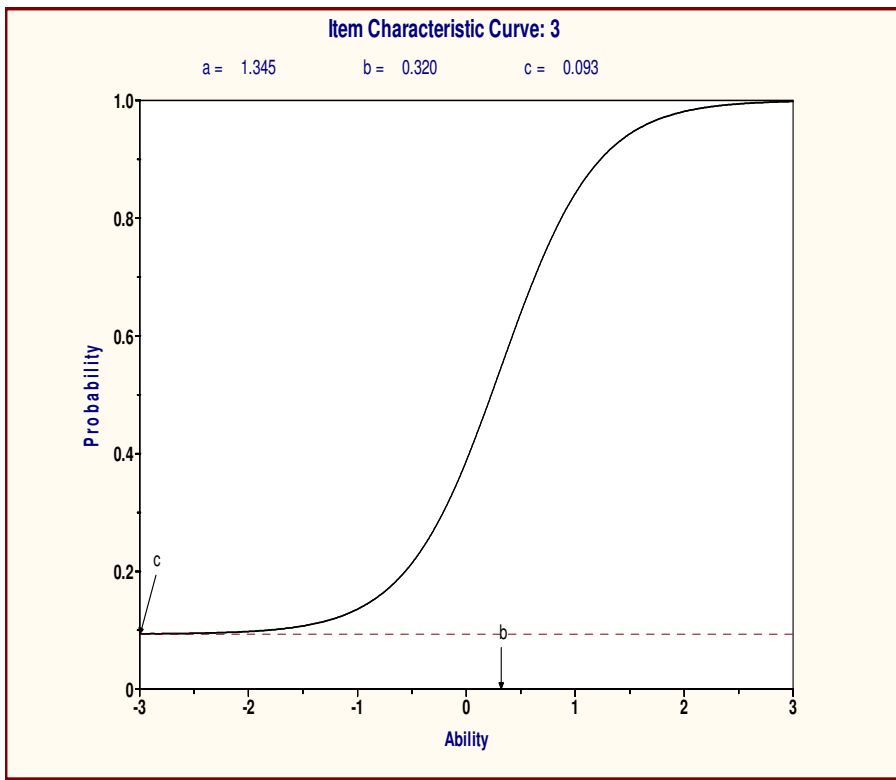
Figure 3. The two item characteristics curves. M (a=0.887, b=-0.028, c=0.438); F(a=0.883, b=0.141,c=0.569).

female item characteristics curve for item 31 was more or less flat, that is a straight horizontal line, which cannot discriminate well among the female group. This item was biased towards the female

group. This item is not fit to be part of a public examination (Figure 7).

The nature of the identified five (5) items that demonstrated DIF were such that the questions

leaned towards ideas that depict inherent interests depending on gender. Such interest could be in the area of questions that relate to sports that normally interest male rather than female, or



3 Parameter Logistic Model **Item: 3**

The parameter a is the item discriminating power, the reciprocal ($1/a$) is the item dispersion, b is an item location parameter and c the guessing parameter.

3 Parameter Logistic Model **Item: 3**

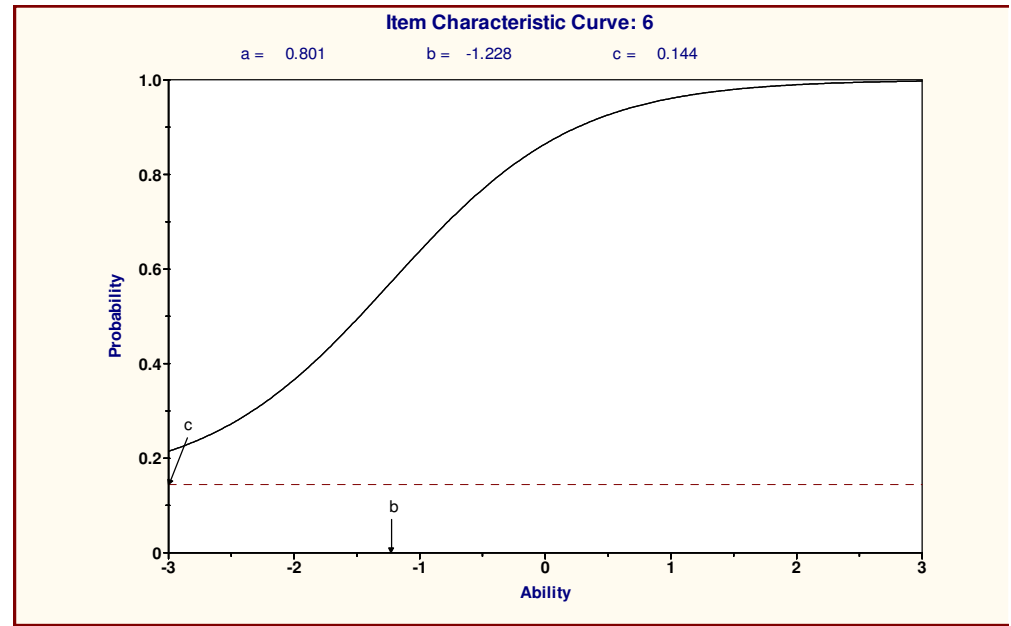
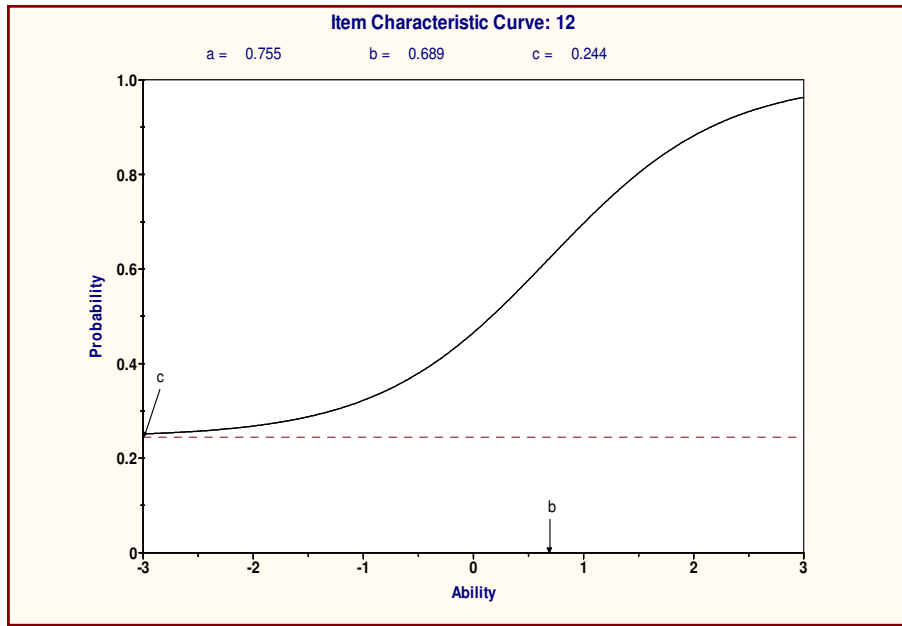
The parameter a is the item discriminating power, the reciprocal ($1/a$) is the item dispersion, b is an item location parameter and c the guessing parameter.

Figure 4. The three item characteristics curves $M(a=1.345, b=0.320, c=0.093)$; $F(a=1.495, b=0.501, c=0.199)$.

questions on everyday domestic activities which will interest the female rather than the male. For example, item 2 was biased towards the male group because the question was on

purchasing of items using the knowledge of cost price, selling price and calculation of discounts. This item favoured the female group because they were more familiar with buying and selling of

goods. Item 3 was a technical question on measurements, the diagram given showed some potatoes on a measuring scale, the question was "what is



3 Parameter Logistic Model **Item: 12**
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

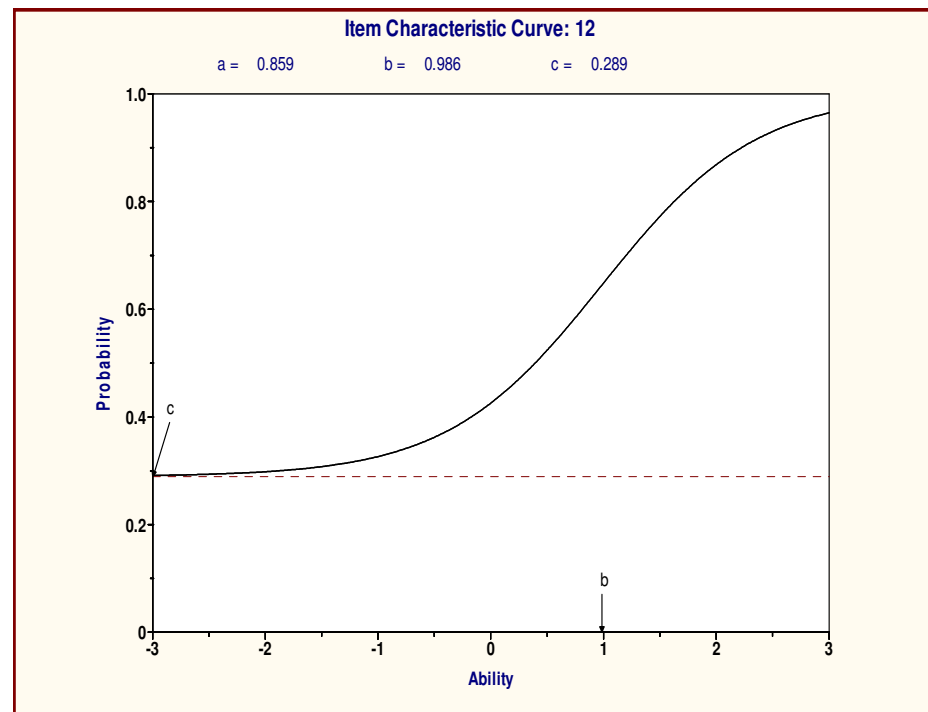
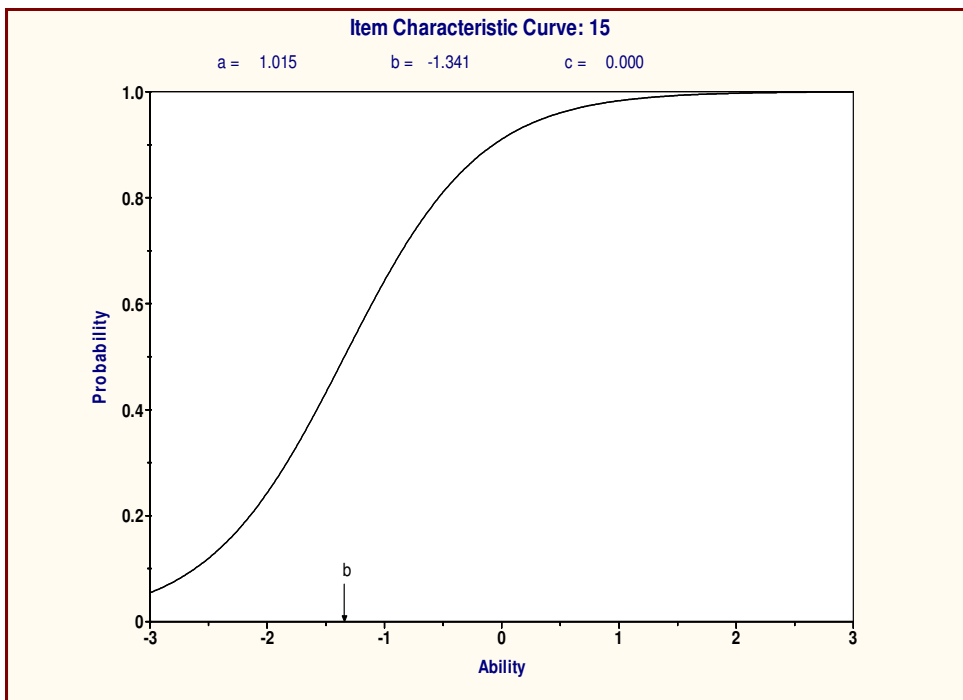
3 Parameter Logistic Model **Item: 6**
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

Figure 5. The twelve item characteristics curves $M(a=0.755, b=-0.689, c=0.244)$; $F(a=0.859, b=-0.986, c=0.289)$.

the mass of the potatoes” reading of the measuring scale could be a problem to the female group. Item 12 was biased towards the male group because of the language used, students were asked to give the name of the shape of “a living room”. The word living room gave the female group more advantage to answer the question than the male group, because domestically, female are more familiar to the word ‘living room’ than their male counterpart. Item 15 was on comparing performances of students

given a bar chart showing marks for four students in a test and the names of these students were left out. This item could be biased towards the female group, because it involved the use of diagrams and interpretation of the bar charts. Item 31, students were asked to give the number of lines of symmetry of a design which was inform of a football shape. Using a design like the football could be biased towards the female group. The findings of this study confirm the views of Scheuneman (1982a) on item bias, who

stressed that an item may be biased if it contains content or language that is differentially familiar to subgroups of examinees, or if the item structure or format is differentially difficult for subgroups of examinees. According to Scheuneman (1982a) an example of content bias against girls would be one in which students are asked to compare the weights of several objects, including a football. Since girls are less likely to have handled a football, they might find the item more difficult than boys, even though they have mastered the



3 Parameter Logistic Model **Item: 15**
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

3 Parameter Logistic Model **Item: 12**
 The parameter a is the item discriminating power, the reciprocal (1/a) is the item dispersion, b is an item location parameter and c the guessing parameter.

Figure 6. The fifteen item characteristics curves. M (a=1.015, b=-1.341, c=0.018); F(a=0.861, b=-1.586, c=0.283).

concept measured by the item.

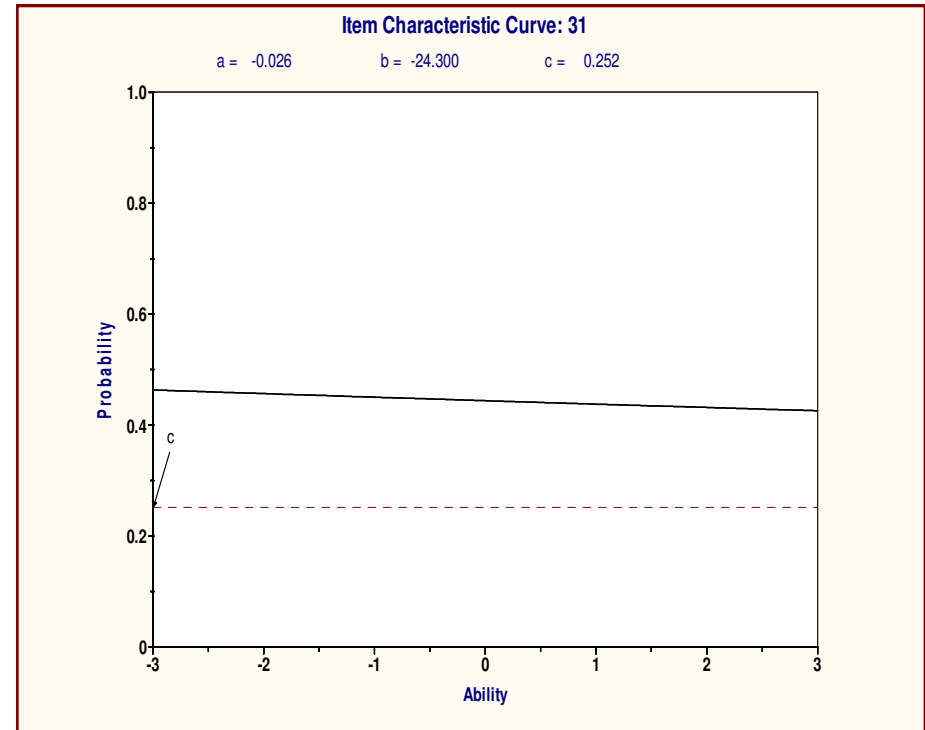
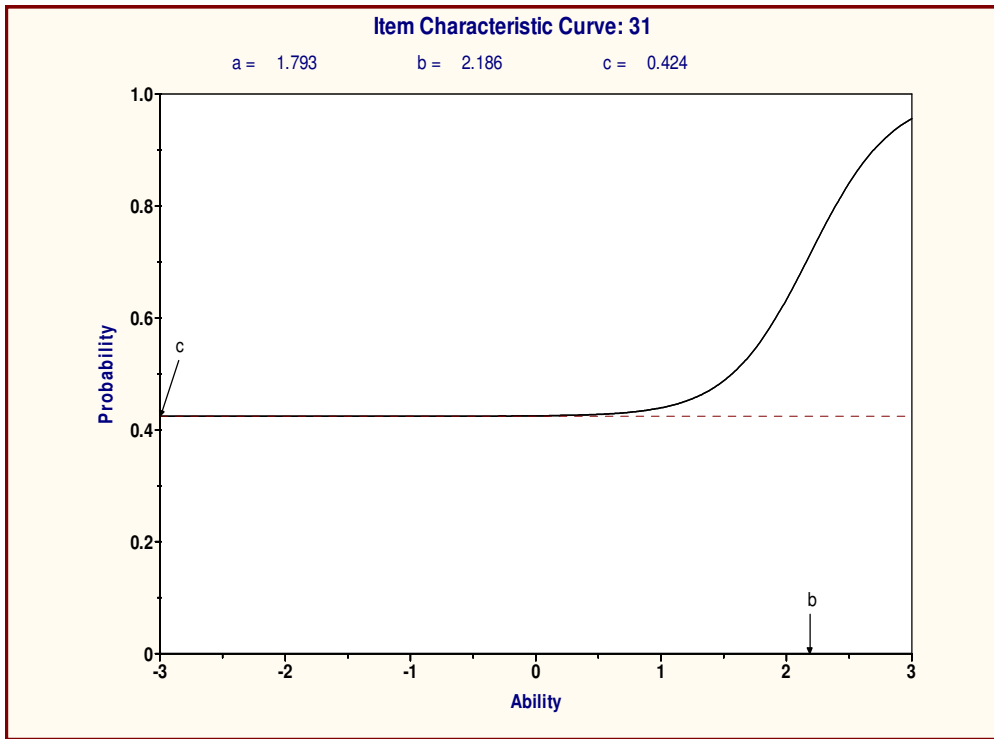
Conclusion

The reality of item bias is a phenomenon that must be acknowledged and appropriately dealt with in examinations and tests designed for

heterogeneous groups. In accordance with the findings of this study, it is suggested that item bias need not be a limitation to ensuring gender fairness, provided that the bias does not cause a recognizable difference in the total test scores of different groups.

Through the application of IRT methodology (ICC), it was clear that the biased items that were

identified in the 2004 Botswana mathematics paper 1 examination would definitely have caused a recognizable difference in test scores for the male and female groups. This study only tried to identify the test item bias for the 2004 Botswana mathematics paper 1, there is need to detect gender bias test items from other subjects in any public examinations, through the use of item



3 Parameter Logistic Model **Item: 31**
 The parameter a is the item discriminating power, the reciprocal ($1/a$) is the item dispersion, b is an item location parameter and c the guessing parameter.

3 Parameter Logistic Model **Item: 31**
 The parameter a is the item discriminating power, the reciprocal ($1/a$) is the item dispersion, b is an item location parameter and c the guessing parameter.

Figure 7. The thirty one item characteristic curve, M ($a=1.793, b=2.186, c=0.424$); F($a=-0.026, b=-24.300, c=0.252$).

response approach (ICC curves).

RECOMMENDATIONS

1. For more objective, educational measurement IRT theoretical framework should be incorporated

by Examination Boards into educational measurement practices, tests or examinations in Africa.

2. The construction and analysis of public examinations in Africa should utilise item response theory approach.

3. The item characteristic curves should be used

to detect for gender bias test items. Test items should be free from bias towards a particular group.

4. The issue of IRT parameter estimates is still new in Africa, therefore, workshops, seminars and conferences should be organised for researchers in educational testing.

5. It is high time for experts in educational measurement in Africa to rise to the challenges pose by the measurement community and be fully aware of the usefulness of IRT in constructing and scoring of tests or examinations.

REFERENCES

- Camilli G, Shepard LA (1994). *Methods for identifying biased test items*. Newbury Park, CA: Sage.
- Embretson S, Reise SP (2000). *Item response theory for psychologists*. Mahwah New Jersey: Lawrence Erlbaum Associates Publishers.
- Hambleton R, Rodgers J (1995). Item bias review. *Practical Assessment, Research, and Evaluation*, 4(6). Retrieved March 18, 2009, from <http://PAREonline.net/getvn.asp?v=4&dn=6>.
- Hambleton RK, Swaminathan H, Rogers HJ (1991). *Fundamentals of item response theory*. Newbury Park, California: Sage Publications.
- Hambleton RK, Swaminathan H (1995). *Item response theory: Principles and application*. Boston: Kluwer.
- Kimball MM (1989). A new perspective on women's math achievement. *Psychol. Bull.* 105: 198-214.
- Lord FM (1980). *Applications of item response theory to practical testing problems*. Mahwah, NJ: Erlbaum.
- Perrone M (2006). Differential item functioning and item bias: Critical consideration in test fairness. *Applied Linguistics*, 6(2): 1-3.
- Roever C (2005). "That's not fair!" Fairness, bias, and differential item functioning in language testing. Retrieved March 18, 2009, from the University of Hawai'i System Web site: <http://www2.hawaii.edu/~roever/brownbag.pdf>.
- Scheuneman JD (1982). A new look at bias in aptitude tests. In P. Merrifield (Ed.), *New directions for testing and measurement: Measuring human abilities*, No. 12. San Francisco: Jossey-Bass.
- Scheuneman JD, Grima A (1997). Characteristics of quantitative word items associated with differential item functioning for female and black examinees. *Applied Measurement in Education*, 4: 299-320.
- Thissen.D (1991). *Multilog version 7.0. Multiple categorical item analysis and test scoring using Item Response Theory*. Chicago; Scientific Software International.
- Zumbo BD (1999). *A handbook on the theory and methods of differential item functioning (DIF): Logistic regression modeling as a unitary framework for binary and Likert-like (ordinal) item scores*. Ottawa, Canada: Directorate of Human Resources Research and Evaluation.

Full Length Research Paper

Niger Delta youth restiveness and socio-economic development of Nigeria

Emma E. O. Chukwuemeka^{1*} and V. N. O. Aghara²

¹Department of Public Administration, Nnamdi Azikiwe University, Awka, Nigeria.

²Department of Marketing, Nnamdi Azikiwe University, Awka, Nigeria.

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This paper examines youth restiveness in the Niger Delta region of Nigeria, and the challenges it posed to Nigeria democracy and foreign investment. Non-parametric statistical and content analyses were essentially used as tools of analysis. The results showed that dissatisfaction of the people of Niger Delta especially the youths on the level of attention given to the development of their region and the damages to their ecology by oil spillage are the major causes of the alarming youth restiveness. Surprisingly, the Niger Delta region constitutes about 80% to the revenue of Nigeria. It is against this backdrop that the paper suggests an immediate review of the current revenue sharing formula. The new formula should be made to address poverty, and neglect of the Niger Delta region. Oil companies operating in the region should pay a greater percentage of their royalty directly to the host communities in the Niger Delta region.

Key words: Youth, restiveness, marginalisation

INTRODUCTION

The assertion by the then Governor of Akwa Ibom State Victor Attah that his people were ready for war with the Federal Government of Nigeria over resource control, particularly the on-shore/off-shore, controversy, between the Federal Government and the state governments that had since been taken to supreme court for a declaration of the constitutionality or otherwise of the contending claims was not simply the latest indication of the bitter relationship between the government and the people, but a clear manifestation of the endemic nature of restiveness both among the adults and youths (Nweke, 2002).

It is important to state that the human society, and in fact, the entire universe is simply and squarely a complex entity. To that extent, individuals and groups have their own complexities, needs, aspirations, hopes, goals, opinions, views, and values which could be social, economic, religious, psychological or political (Anioke, 2002).

Consequently, restiveness is bound to occur. It therefore presupposes that since conflict is a situation that is natural to man, our social life revolves and grows in con-

flict and restiveness.

Contributing to the dialogue on the Niger Delta, Elaigwu (2008) said that despite being the goose that lays the golden eggs for the nation, the Niger Delta is widely regarded as a region wounded by youth militancy, fragmented by internal strife, bruised by incessant conflicts between local communities and oil producing multinationals, and glamorized by series of high-profile kidnapping incidents. Continuing, he said, that obviously what makes Nigeria what it is today is oil; what makes Nigeria comfortable comes from the Niger Delta; but unfortunately, the Niger Deltans are not comfortable at all. A lot of people, especially at the grassroots, are suffering in the midst of plenty, and unless they are made comfortable to some extent, this crisis will keep escalating and possibly degenerate to a full blown war that might engender the possible break-up of the country. He added that re-branding the Niger Delta is a brilliant idea and it is the best thing that can happen to Nigeria and Nigerians as a whole. This is because anytime the Niger Delta is mentioned, what immediately comes to mind is violence. However the point remains that you cannot re-brand the Niger Delta in isolation of the larger entity Nigeria.

The EGBESU, OPC, MASSOB, MOSOP, MEND and

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

other ethnic cleavages abound and are getting out of proportion. The invasion of the multinational oil companies by restive youths in the Niger Delta, the abduction and kidnapping of foreign nationals working in oil companies, the incessant harassment of traders in Lagos and the every-day-clash in Jos, Nigeria pose a lot of questions to the very ideal of a sustainable democratic government in Nigeria. The composite unemployment in Nigeria increased from 3.8% in December, 2001 to 4.2% in the first half of 2006 (Chukwuemeka, 2003). The rate is still high, and when it is realised that an average figure has been given, indications are that it could be higher in some places like Bayelsa one of the states in the Niger Delta region. Structural unemployment results in talents not being used where they are available, idle mind definitely is the devil's workshop.

The people of the Niger Delta region where the nation derive greater percentage of her natural resources has persistently complained that adequate attention has not been given to them as regards development, employment, social amenities etc, despite, the environmental devastation resulting from oil, which cause them untold hardship. The situation has degenerated to a lot of controversies and conflicts which has resulted in loss of lives, personal and public properties as well as the kidnapping of foreign oil workers.

The situation worsened between the period 1999 and 2007 and has resulted in the declaration of curfew in some states in the Niger Delta. It is against this backdrop that one wonders the ideal and survival of the present nascent democratic dispensation in Nigeria. Also worrisome is the safety of the foreign nationals and their investment.

It is therefore the objective of this study to make a critical examination of youth restiveness in the Niger Delta region and how it affects socio-economic development in Nigeria.

HYPOTHESIS

Dissatisfaction of the people of Niger Delta on the level of attention to the development of their area by the Federal Government of Nigeria and multinational corporations is one of the major causes of the alarming youth restiveness in the region.

LITERATURE REVIEW

traced to Isaac Adaka Boro, a Niger Delta militant and radical youth. While in the University of Nigeria, Nsukka, he organised secession. The primary aim was to liberate his people from oppression and consequently form the Republic of Niger Delta. This happened in the 1960s. The Federal Government frowned at his secession bid, and subsequently, Boro was arrested and punished accordingly. Marginalisation and utter neglect of the region did

not stop after that. Between 1980 and early 1990s, another radical environmental activist in the person of Ken-Saro Wiwa emerged. He organised some restive youths in the Ogoni land against the Federal Government because of marginalisation and utter neglect. In spite of the fact that the mineral that contribute 90% of Nigeria income is sourced from their region, their region is one of the most underdeveloped in Nigeria (Chukwuemeka, 2003).

During the reign of General Sani Abacha's military junta, Saro Wiwa and the members of his restive group were arrested, tortured and gruesomely murdered by hanging.

From 1999 youth restiveness in the Niger Delta took a new dimension. The new form of militancy and restiveness include, kidnapping of foreign oil workers, kidnapping of top notchers in government and those supporting government, arson, assassination, and other forms of gruesome murder.

Restiveness according to Abudah (2004) is self generating theory of conflict process within social groups. He further stated that any restive acts of groups whether inter or intra in nature in contemporary history of Nigeria is synonymous with conflict. Intra group restiveness or conflict occurs when there is a competition for an interest (Onah, 1999). The relative deprivation theory asserts that psychological variables and deprivation is the basic product for conflict and restiveness of any kind. The more widespread and intense deprivation is among members of a population, the greater is the magnitude of violence in one form or the other (Famham and Pilmot, 1998). Coleman (1966) argues that the unequal socio-economic development of the various ethnic groups in Nigeria led to inter ethnic and intra ethnic conflict. Once there is an uneven development in all or some facets of human existence within a given society, the different groups will definitely become immersed in the competition for the goods of modernity which invariably leads to a conflict situation.

Asobie (2004) says that there are approximately 300 spills per year in the Niger Delta region. And he blames the restiveness of the Niger Delta youths on the oil multinational corporations that operates in the region that is not committed to the plight of their host communities. Again, he argues that the oil multinational corporation and Federal Government of Nigeria are implicated in the collaboration of militarizing the Niger Delta region.

In the view of Saro-Wiwa (1985), the root causes of conflicts in the Niger Delta are inequitable distribution of revenue, uneven development among the Niger Delta region. He goes on to say that development in the centre has been given much attention than the other levels of government and that there is evident inequality in the developmental approach in Nigeria. He argues that the grassroots and the people of Ogoni land in particular and the people of Niger Delta in general are like goose that lays the golden egg. He argues further that the articulation of

Table 1. A list of seven major oil multinationals, their year of incorporation and oil production position as at 2001 and oil quota as at 2001.

S/N	Oil company	Year of incorporation	Oil production position (2001) (%)	Oil quota as at 2001 (bpd)
1	SPDC Ltd	1939	1 st (42)	950,000
2	EXXON/Mobil	1970	2 nd (21)	700,000
3	Chevron	1960	3 rd (19)	410,000
4	Agip Nigeria Ltd.	1962	4 th (7.5)	155,000
5	Pan Ocean Nigeria Corporation	N/A	5 th (6.6)	NA
6	ELF Petroleum Nigeria LTD.	1983	6 th (2.6)	NA
7	Texaco Nigeria Ltd.	1961	7 th (1.3)	83,769

Source: Asobie (2004) P. 53.

fundamentally different development paradigms had resulted in controversies to peace in the Niger Delta conflicts. Wiwa (1985) further argues that the proximate causes of most of the conflicts in the Niger Delta can easily be identified as the dominance of leaders of specific groups to gain office and use such states and institutions to distribute economic and political benefits preferentially to their interest groups. Discrimination against subordinate groups, often portrayed as less deserving human beings accompanies this preferential treatment. The Niger Delta citizens are in such a very pitiable circumstance. It is based on the above view that Wiwa contends that "... the protection and promotion of the rights of the Niger Delta citizens as well as other disadvantaged groups are essential for a conflict free Nigeria". Pinning it down to the Ogoni people, Wiwa (1985) holds the view that his people Ogoni citizens are people who are internally colonised in the Nigerian Federation. According to him, during the first oil boom, Ogoni land's fifty six oil wells accounted for almost 15% of Nigerian oil production. And in the past three decades as estimated, 30 billion petroleum revenue was realised from Ogoni land. Yet Oloibiun where the first oil was pumped in 1958 had no single motorable road all round season. Ogoni land argues Wiwa (1985) is wrecked by unthinkable misery and deprivation. Only few Ogoni communities have electricity, there is one medical doctor per one thousand people, child mortality rates are the highest in Nigeria Nation, unemployment is 85% of the population and a greater percentage of the population are illiterates and close to half of the Ogoni youths have left the Niger Delta region in search of work. Life expectancy is barely fifty years (Eghosa, 1996).

In the words of Saro Wiwa (1985):

Economic conditions have deteriorated in the Niger Delta region, especially in Ogoni land since the onset of oil production. That is to say, no progress in local development since 1960...and he finally summed up that systematic reduction of Federal allocation and lack of concern by the Federal and Government of the various states in the Niger Delta region. Part of a long history of the politics of minority suffocation.

Omoku (2003) argues that the first issue to be addressed is how the pursuit of oil wealth underlies persistent national policy failures in Nigeria. Since 1970, the Country's political, economic, and policy elites have established an authoritarian power structure to enable them to centralise control of strategic resources including the Country's substantial oil deposits. Such a structure has not only banished the great majority of ordinary Nigerians from the policy making process, but it has also led the power elites to pursue social and economic strategies that are short sighted, self-serving, and not driven by the needs of the people. The consequences have been material scarcity, deep frustration, and youth restiveness in the Niger Delta region.

The role of the multinational oil corporations (MNCs) in the Niger Delta conflicts

Exploration and production of oil in the Niger Delta region are done by various oil multinational corporations. It all began in 1938 when the colonial government granted Shell and Amay Petroleum the first mineral oil concession. The Company immediately began geological mitigation. The Shell British Petroleum's monopoly came to an end in 1955, when Mobil Exploration Nigeria Ltd., a subsidiary of the American colony, Mobil Oil Company joined the exploration search. Since then other multinational corporations have joined the oil business in the Niger Delta region. The table below (Table 1) is a list of seven major oil multinationals, their year of incorporation and oil production position as at 2001 and oil quota as at 2001.

The table shows that oil sector is in the hands of foreign multinational corporations. Their operational base is in the Niger Delta region where the oil is exploited. The oil rich Niger Delta has been visited with the worst form of environmental pollution and degradation from the activities of these oil multinationals. Despite this, all multinational corporations do not live up to their billings in terms of performing their social responsibilities to the oil producing host communities, rather they collaborated with Federal Government to perpetrate the underdevelopment of the Niger Delta region.

Though in a few cases social infrastructures like pipe borne water, electricity, motorable roads, school buildings, scholarship programmes and job opportunities among other things are provided for the oil producing communities, but such facilities are not commensurate with the impact of environmental pollution and degradation suffered by the oil producing communities, neither is it commensurate with the high profit they made from the activities in the region. The most painful of all activities of the oil multinational corporations is that they have been implicated in the act of collusion with the Federal Government in the militarization of the Niger Delta region. They invariably divert the resources they should have used in the development of the Niger Delta region to security.

As to youth restiveness in the Niger Delta region, the oil multinationals are the worse off as the militant groups destroy their industries, installations, their workers are either kidnapped or taken hostage by the militant groups, Pipelines and other equipment are also vandalized. Work normally stops in such circumstances leading to the loss of some 12 million barrels of crude oil worth billions of naira. In Ogoni land alone, Shell has been loosing about 8,000 barrels of crude oil per day since the Ogoni rally of January 1993 (Chukwuemeka, 2007). Even as at today, SPDC has not fully resumed exploration activity in Ogoni land. In all, the Company estimates that over 60% of spills and leakages affecting its installation are caused by acts of sabotage by aggrieved oil producing communities of the Niger Delta (Chukwuemeka, 2007).

One of the major grievances of the Niger Delta people is that all laws relating to oil exploration and land ownership be abrogated. Having in mind that decrees and laws were schemed to keep the Niger Delta people in total penury and nothing short of the restructuring of the Nigerian Federal structure and abrogation of such obnoxious laws will be capable of restoring and maintaining peace in the region. All conflicts in the Niger Delta region is as a result of the injustice meted out on them by the Federal Government of Nigeria.

Re-branding as a Way of Polishing the Image of the Niger Delta

From the marketing perspective, Berkowitz, Kenn, Hartley and Rudelius define branding as an activity in which an organization uses a name, phrase, design or symbol, or a combination of these, to identify its products and distinguish them from those of a competitor. However, re-branding becomes necessary when that product/brand starts losing its image or essence of existence. Hence the need for re-branding, re-packaging, etc becomes necessary.

Coincidentally, we are in the process of re-branding Nigeria as a nation and by extension a brand that has started losing its image or essence of existence. So invariably, the Niger Delta being a sub-system of Nigeria, what is

happening in the Niger Delta is not entirely different from happenings in the rest of the country. The only difference however, is that about 90% of the resources that sustains Nigeria comes from the Niger Delta. If these resources come from any other region and given the same posture of the Federal Government, that region's reaction will not be different from that of the Niger Delta. Take the issue of employment, the best any other state will give a Niger Deltan is a contract employment (not minding that the Niger Delta region provides the bulk of the resources that drives that home state and Nigeria).

Giving further insight into the re-branding process, Elaigwu and Isichei (2009) said that techniques of nation branding need to be employed in the repackaging process of the Niger Delta. They emphasize that nation branding is both a theoretical and practice-oriented process which seeks to measure, build and manage a nation's reputation, with a view to making the nation more appealing and marketable to the international community and pave the way for more trade tourism and socio-political interactions.

A British branding expert, Olins (1999) listed a seven-step plan to brand a country which includes:

- (i) Set up working party with representatives of government, industry, media, etc to start the program.
- (ii) Find out how the nation is perceived both by its people and other nations through qualitative and quantitative research (2-way communication).
- (iii) Develop a process of consultation with opinion leaders to look at national strengths and weaknesses.
- (iv) Create the central idea on which the strategy is based with professional advisors.
- (v) Develop ways of articulating the central area visually, including logos.
- (vi) Look at how the messages required for tourism, export, etc are appropriate for each audience.
- (vii) Create a liaison system through the working party to launch and sustain the program and encourage supportive action from appropriate organizations in industry, media, etc.

The above steps were amplified by Tench and Yeomans (2006) who view nation branding from the perspective of International Public Relations (IPR), for countries in terms of destination branding, country branding, cultural diplomacy, public diplomacy and perception management. Drawing a reference, they said that another driving force behind International government PR was the deadly attack on the World Trade Centre on September 11, 2001, which made the US government realize that its foreign policy objectives and values are not understood by many nations. After the attack, different task forces and think-tanks were set up to communicate US values, policies, images etc, to the world, but mostly as a one-way communication. 'Branding US', was one of the responses, which involved the failed advertising efforts in Arab countries. The failure demonstrated that branding in itself is not sufficient, especially if the 'product' itself is pro-

blematic. The other reason for failure was the lack of systematic research into Arab cultures at the planning stage. The US government has to realize that it was not engaging in two-way systematic communication at all.

Comparing the above with the efforts of the Federal Government in re-branding Nigeria, one sees a lot of inconsistencies, when viewed from the perspective of Olins seven-step plan to brand a country. To start with, the average Nigerian does not believe in the re-branding. They see the country's leadership as inept and corrupt which rubs-off on the international community, where holding the Nigerian passport is simply repulsive. So to re-brand Nigeria is problematic. The leadership has not taken into account the internal dynamics of the citizenry before embarking on the re-branding. Take the issue of the \$180m (USD) bribe money collected by top and high ranking government officials from Halliburton corporation of the US, to get a \$6bn (USD) oil service contract in the Niger Delta. While Halliburton and their other US associate companies have since been punished according to US law, the Federal Government of Nigeria has not bothered to bring the officials named in the bribe scandal to book. One can then imagine how the average Niger Deltan will feel when he reads in the pages of newspapers the level of recklessness with which government officials mismanage their natural resources. So a re-branding of the Niger Delta and indeed Nigeria should start with the President and the governors of the Niger Delta states.

Kalawole (2009) aptly described Nigeria thus: "...may be Yar'Adua wants to redeem the image of his administration and show the world that he means business. Let's wait and see". He did nothing about the Siemens and Wilbros scandals. Has he repented? If those untouchable Halliburton bribe takes (and not just their fronts) are actually brought to book, there is no way the world would not take Yar'Adua seriously. In fact, he would be invited to the next G20 and G7 meetings. Yar'Adua needs to re-brand himself urgently.' Also equally important is that for this re-branding to be effective and worth its while, Olins seven-steps plan to brand a country must be fully taken into consideration.

The role of the environmental activists and the international community in the Niger Delta conflicts

Environmental activists such as Ken Saro-Wiwa did a lot to ignite environmental consciousnesses among the Niger Delta people and that has been the order of the day. The Niger Deltans are now aware of the damage, which the oil exploration and production has done to their environment, and now make bold request for compensation because of the environmental degradation and pollution caused by the activities of the oil companies for the region. Through this environmentalist, the course of the Niger Deltans became an international issue. When in 1994/1995 the movement for the survival of Ogoni

people (MASSO), an ethnic militant organisation aimed at protecting the environment and economic rights of the Ogoni people against pollution and, exploitation, found itself at a head on collusion with the military government and oil companies. MASSOP leaders were rounded up and accused of complicity in the killing of several Ogoni chiefs and leaders who were regarded as sympathetic to the oil companies and the Nigeria Military Government. The incident led to the execution of the members of the movement and several leaders under that usual judicial circumstance, which led to serious international anger against the then Military Government of Sani Abacha.

Recently, the European Union (EU) has announced its intention to execute 12,000 projects in the Niger Delta region. According to Pratt EU's Programme Manager in charge of the micro projects 6 (MPP6), the Commission chose the Niger Delta region because, the region is characterized by very complex web of conflicting interests around environment and development. The project is aimed at improving basic physical and social infrastructure to reduce tension in the region. The project is in line with recognition of tension and conflicts in the Niger Delta region by the international community.

METHODOLOGY

Method of data collection

Questionnaire, oral interview and personal observation were used as major instrument for data collection.

Target population/sample selection

The population of the study is an infinite one (about 40,000) made up of adults between the ages of 30 and 70 and youths between the ages of 20 and 30. Therefore 350 respondents were selected using quota purposive sampling technique.

Questionnaire return rate

On the whole 350 copies of questionnaire were distributed, but a total of 320 were returned duly filled.

Validation of research instrument

Pilot test

The questionnaire were administered to a proportion of the sample and others not included in the sample. The aim was to find out whether the questionnaire and interview guide meant the same thing to all the respondents and to find out whether the questions would be easily understood by the respondents.

Content validity

Content validation was used to ensure that the two instrument measure what they suppose to measure to ensure that reliable data were collected from the respondents.

Table 2. Respondents opinion on the major causes of youth restiveness in the Niger Delta region.

Response	Youth	Adult	Total
Yes	140	20	160
No	125	35	160
Total	265	55	320

Source: Field survey (2007).

Table 3. Respondents' opinion on inordinate pursuit of wealth by some members of the Niger Delta region.

Response	Youth	Adult	Total
Yes	50	10	60
No	215	35	250
Total	265	55	320

Source: Field survey (2007).

Table 4. Respondents' opinion on increment in fund allocation to the Niger Delta.

Response	Youth	Adult	Total
Yes	135	30	165
No	130	25	155
Total	265	55	320

Source: Field survey, (2007).

Criterion related validity

This was employed to compare tests and scale scores with external variables known to measure the attribute under study.

Method of data analysis

The main statistical tool used for analysis is Chi-square. The exercise essentially involved data that were discrete, categorical and non-parametric in nature.

Data presentation

Question 1: Youth restiveness in the Niger Delta is as a result of utter neglect by Government and oil multinationals, oppression, internal colonisation and political suffocation (Table 2).

Question 2: Do you think that the restiveness in the Niger Delta region is not a function of marginalisation but inordinate pursuit of wealth by some overzealous members of the region? (Table 3).

Question 3: Do you think that the restiveness in the Niger Delta would stop if the government increases the fund allocation to the region? (Table 4).

Question 4: Do you think that if youth unemployment and poverty is controlled, restiveness would cease in the Niger Delta region? (Table 5).

Question 5: Ecological devastation and poor fund allocation, which one do you consider more serious? (Table 6).

Test of hypothesis (calculation of X^2)

Ho: Dissatisfaction of the people of the Niger Delta on the level of

attention to the development of the area by Federal Government and multinational companies is one of the major causes of the alarming youth restiveness in the region.

To test the hypothesis, Chi-square X^2 non-parametric statistical measure was adopted.

Degree of freedom

$$Df = (r-1) (c-)$$

$$df = (2-1) (2-1) = 1 \times 1 = 1$$

5% level of significance at 1 degree of freedom = 3.841.

From the Chi-square table, table value at 5% significance level and 1 degree of freedom is 3.841, computed value of X^2 , 4.938 is greater than the table value. Therefore H1 is accepted and H0 rejected.

DISCUSSION AND FINDINGS

This study has made an overview of Niger Delta restiveness and social-economic development of Nigeria. The outcome of the empirical test supports the secondary data that we critically evaluated in the literature review.

The item-by-item analysis revealed that the Niger Delta people are actually oppressed, and politically marginalized. In spite of the fact that many respondents failed to agree that the restiveness is more of a function of inordinate pursuit of wealth and avarice, some of the people interviewed were of the view that restiveness is more or less a function of inordinate quest for materialism.

Table 6. Respondents' opinion on the preference between increased fund allocation and ecological devastation.

Response	Youth	Adult	Total
Yes	140	40	180
No	125	15	140
Total	265	55	320

Source: Field survey, (2007).

Table 7. Computation of X^2 .

Cell	Fo	Fe	(fo-fe) ²	(fo-fe) ² /fe
1.1	140	132.5	56.25	0.424
1.2	20	27.5	-56.25	2.045
2.1	125	132.5	-56.25	0.424
2.2	35	27.5	56.25	2.045
				4.938

Source: Compiled from Table 2.

Inadequate distribution of revenue of the federation and poor revenue base of the Niger Delta region is also established to contribute largely to the restiveness. Many respondents were of the opinion that restiveness would cease if more fund is allocated to the region.

Youth unemployment, poverty and other related social maladies are discovered to be prevalent in the Niger Delta region, and therefore have heightened restiveness. Many of the people interviewed were of the opinion that if the youths in the region are gainfully employed, restiveness would die a natural death since, 'an idle mind is a devil's workshop'.

Environmental degradation and pollution of the region by oil companies make it almost impossible to breathe good air and drink clean and good water, which results to low level of life expectancy. The respondents were more critical on environmental degradation than fund. According to them they would prefer the preservation of their ecology than devastate it and pay for it.

Implications of this study for Nigeria nascent democracy, socio-economic development and foreign investment

As already noted, the incidence of marginalisation, denial of social right, environmental degradation and economic devastation activities by the Government of Nigeria had triggered off the irate youths in the Niger Delta region to involve in all sorts of restiveness in demand of their right. This act had led to hijacking, abduction, hostage and kidnapping of oil expatriates in the Niger Delta region. The situation is now degenerating into other regions in Nigeria.

From all indications, this quagmire portends a serious threat to the new democratic dispensation which is at its

nadir stage. It cannot also allow any meaningful economic development to thrive in Nigeria.

Democracy will find it difficult to thrive in crises. The leaders would spend the time they would have used to formulate policies that would touch the life of the people to formulate conflict-control policies and sink fund that could be used for development to control restiveness. The situation would not also encourage international cooperation. No foreign investor would also like to invest in a vulnerable and crisis prone economy.

CONCLUDING REMARKS AND RECOMMENDATIONS

It is therefore the position of this paper that the following should be done:

- Revenue sharing formula should be reviewed without further delay. The new formula must be made to address poverty and neglect in the Niger Delta.
- Oil companies operating in the Niger Delta region should pay a greater percentage of their royalty direct to the host communities.
- Nefarious activities of the governing elites who hijack special funds mapped out to address the problem of the Niger Delta citizens should be checked. Any culprit should be prosecuted, tried and jailed with hard labour.
- The nefarious practices of those who sponsor and spur the youths into restiveness for their own selfish ambition should be checked.

Unless these recommendations are urgently implemented, Nigeria in the near future would become a war-zone, a situation which would be most catastrophic to the indigenes and foreign nationals and investors. Most importantly, the situation if not checked and controlled could

degenerate to mar the “guided nascent democracy” in Nigeria.

REFERENCES

- Abdah KB (2004). Alternative dispute Resolution, in Niger. Law Practice J., 2(1): 6.
- Agbara VNO, Okpala CG (2008). The Effect of Federal Government Policy On Nigerian Exporters a Paper presented at the Internet Session of the Global \ Conference on Business and Finance (GCBF), Winter Conference January 9-12, 2008 at Sharaton Waikiki, Honolulu, Hawaii.
- Anioke U (1998). “Crises situation and its management” a paper presented In a workshop at Modotels, Enugu.
- Anioke U (2002). “Conflict Resolution in the Local Government” paper Presented in a workshop, organised by Local Government Service Commission, Enugu.
- Asobie A (2004). Conflict Resolution and Human Rights: A case study approach Ibadan: E Watch Print.
- Chukwuemeka E (2003). Principles of Human and Personnel management in Nigeria, Enugu: HRV Publishers
- Chukwuemeka E (2007). “Youth crises in Nigeria, causes and solutions” J. P. D. S. 2:1
- Chukwuemeka E (2006). “Bourgeoisie against peasants: A political diagnosis Of the evil consequences of multinationals in Africa” J. Int. Stud., No. 1.
- Coleman JS (1996). Nigeria, Background to Nationalism, Benin City: Borburg and Winston.
- Egbosa TO (1996). Ethnic Minorities and Federalism Lagos: African Affairs.
- Elaigwu A (2008). Re-branding the Niger Delta for Socio-economic Development, *Businessday Newspaper*, 7(11): 476, 72-73
- Kolawole S (2009). So Yar’Adua could be Bothered. *Thisday Newspapeer*, April, 05 14(5096): 124.
- Farnham D, Pilmot J (1998). *Understanding Industrial Relations*, London: Cassel Publishers.
- Olins W (1999). *Taking Identities – Why countries and companies are taking Each others Roles*, London: Foreign Policy Centre.
- Omouku A (2003) Sustainable Development as a strategy for conflict Resoultion, The case of Niger Delta (on line <http://ogele.org/featuresNigerdelta2.html>).
- Onah KE (1999) *Theories of Political violence and Revolution*, Ibadan: London House.
- Okpata FO (2004). *Theory and Practice of Public Administration, An Integrated Approach*, Enugu: Chelston Agency, Ltd.
- Saro-Wiwa K (1985). *A month and a day: A detention diary*, London: Pengium Books.
- Schatz LH (1969). *Petroleum in Nigeria*, Ibadan: Oxford University Press.
- Tench W, Yeomans L (2006). *Exploring Public Relations*, Harlow, Pearson Educational Limited.

Full Length Research Paper

Secondary school headteachers' quality assurance strategies and challenges in Gucha district, Kenya

Florence Osiri Mobegi^{1*}, A. Benjamin Ondigi² and Paul Odhiambo Oburu³

¹Eregi Teachers Training College, Kenya.

²Department of Educational Management and Foundations, Maseno University, Kenya.

³Department of Educational Psychology, Maseno University, Kenya.

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The desire to provide quality education for all Kenyan children was one of the major objectives of the struggle for independence. The government is currently implementing measures to improve the quality of education in secondary schools. The Kenya Education Staff Institute is strengthening capacities of education managers and reviewing staffing norms in order to ensure the equitable distribution of teachers and thus improve on their utilization. The government is also providing in-service education for teachers in various subjects to enhance subject mastery, and rationalizing the curriculum with a view to reduce the workload on both students and teachers. Despite the efforts to provide quality education, the secondary sub-sector continues to face challenges that could compromise the quality of education provided. The current study set out to investigate the strategies employed by headteachers and the challenges headteachers had faced in their attempts to provide quality education. The research design used was descriptive survey method. The study population consisted of 120 public secondary schools. Stratified random sampling technique was used to select five girls', four boys' schools and 37 co-educational schools. Questionnaire, interviews and observations were used to obtain data. Data were analyzed by the use of descriptive statistics of frequencies and percentages. Data from interviews were analyzed qualitatively in an on-going process as the themes and sub-themes emerged from data. The findings of the study showed that headteachers' curriculum supervisory methods were limited to checking of teachers' professional records and gave less emphasis to departmental supervision, self appraisal and class-visits. Financial constraint was revealed as the major challenge which impacted negatively on physical facilities, teaching and learning materials, and teaching methods. Therefore, the study concluded that headteachers employed inadequate methods for the supervision of teachers in the sampled schools, preferring to rely on written records to establish the quality of education and recommended that they should take up their roles as quality assurance officers and ensure that all modern methods were employed in secondary schools. Further, headteachers should devise school income generating projects to improve on financial problems that currently result in student absenteeism, transfers and inadequate facilities.

Key words: Quality education, quality assurance, challenges, strategies, teaching methods, curriculum supervision, teacher appraisal, headteachers.

BACKGROUND TO THE STUDY

Previous researchers have suggested that a number of factors contribute to the establishment of quality education in schools. For example, Digolo (2003), and Eshiwani (1993) observed that the maintenance of factors such as curriculum, instructional materials, equipment, school

management, teacher training and resources are some of the indicators of quality education. In addition, Gogo (2002) reported that low performance could be attributed to inadequate finance which resulted to inadequate supply of teaching and learning materials and equipment. Olembo (1992) also suggested that provision of quality education requires that headteachers be involved in translation of education policies and objectives into viable

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

Table 1. Nyanza province Kenya certificate of secondary examination performance per district for the period 1997 - 2005.

District	Mean scores in Kenya certificate of secondary examination								
	1997	1998	1999	2000	2001	2002	2003	2004	2005
Kisumu	5.241	5.212	5.293	5.257	5.246	5.300	5.432	5.851	5.824
Homa Bay	5.519	5.384	5.311	5.623	5.580	5.384	5.684	5.894	5.812
Kisii	4.182	4.123	4.119	4.391	4.362	4.208	4.483	4.352	4.498
Siaya	5.665	5.582	5.373	5.874	5.628	5.523	5.776	5.872	5.954
Nyamira	3.996	3.930	3.967	4.315	4.087	4.214	4.501	4.545	4.351
Migori	5.825	5.858	5.621	6.113	5.888	5.471	5.620	5.826	5.855
Suba	4.976	5.671	5.919	6.046	6.014	5.701	5.727	5.791	5.505
Rachuonyo	4.911	4.868	4.973	5.440	5.401	5.001	5.373	5.562	5.958
Gucha	4.958	3.958	3.798	4.160	4.077	3.977	4.277	4.391	4.310
Bondo			5.923	6.112	5.973	6.698	5.935	6.005	6.013
Nyando			5.367	5.846	5.817	5.415	5.626	6.025	6.017

Source: Provincial director of education office Kisumu (2006).

programmes within the school; while Shiundu and Omulando (1992) emphasized that on a daily basis headteachers have the responsibility to ensure that teachers implement the set curriculum and that learning activities take place.

In order to support teaching and learning processes, Doharly (1993) observed that the headteacher should ensure quality curricular supervision and provision of adequate physical resources. Neil and Kitson (1996) further maintained that the headteacher is responsible for selection of subject appearing in the school curriculum. This was necessary to ensure that a well- balanced education is provided to students. On the same point, Bound et al. (1994) suggested that the quality of principals is a relevant indicator of quality schools, and therefore underscored the importance of headteachers in school administration. Given this background, the aim of the current study was to investigate the strategies employed by secondary school headteachers in the supervision of the curriculum and the challenges they faced in their attempts to provide quality education.

Statement of the problem

One indicator of quality education is evidenced by the performance of schools in the national examination outcomes (Coombs, 1968). In Gucha district found in Kenya, examination performance has long remained poor especially when compared to Nyamira and Kisii central. The expected maximum mean score is 12 the equivalent of grade A, while the minimum score is 1 the equivalent of grade E. The performance of Gucha district in national examinations in 1997 -2005 was averagely a mean score of 4 the equivalent of D+ which is considered a failure because the graduates of this grade cannot be admitted in most careers for further education and training (Table 1). From the literature that was reviewed, no research on

quality education has been conducted in this district to find out why the quality of education has remained low. With the persistent poor academic performance in the district, there is a need to identify strategies which can be laid down by headteachers as in their role as Quality Assurance agents in order to bring about improved performance in national examinations. This study, therefore aimed at investigating the challenges and opportunities, and possible strategies that could be put in place to provide quality education in Gucha District.

RESEARCH METHODOLOGY

Research design

The study explored the strategies employed by headteachers and the challenges they faced in their attempts to provide quality education in Gucha district. Descriptive survey research design was used. This design was found to be ideal as it enabled an in-depth study of the relevant variables to be made in order to establish existing conditions in the schools. Studies that are concerned with what people think and what they do, and different types of educational fact finding, can utilize this research design (Babbie, 1979; Frankel and Wallen, 1993).

Area of study

This study was conducted in Gucha District in Nyanza Province in western Kenya. According to the 1999 national census, the district had a total population of 438,123 persons and a population density of about 1000 persons per km². The number of poor individuals in the district was estimated to be 269,252. This makes 61% of the population to be living below the poverty line. Poverty Index Range per division is between 51 - 69% (Republic of Kenya, 2003). The economic activities practiced in Gucha are crop farming, dairy farming, soapstone carvings, brick making and small scale businesses. There are few tea processing factories which offer employment to the people. The inhabitants of the area attach great importance to better quality education for their children but this has not been achieved.

Sample and sampling techniques

A stratified random sampling technique was used to select the schools and the category of respondents to be included in the sample. In this study the population strata included boys, girls, and mixed schools. From single sex schools, four boys schools and five girls schools were selected through saturated sampling technique and 37 mixed schools were selected randomly. The 37 mixed schools together with four boys and five girls schools formed a sample of 46 public schools from a total of 120 public schools. This accounted for 38.3% of the total public schools in Gucha District.

Instruments of data collection

Data were collected using questionnaires, interviews and observation checklist. Questionnaire was preferred for its suitability to this study. It was suitable as a method of data collection because it allowed the researcher to reach a large sample within limited time and ensured confidentiality of the information given by the respondents. We designed two questionnaires; one for headteachers, and the other for the curriculum masters and mistresses. The two questionnaires sought to identify the strategies employed by headteachers in their supervision of the curriculum, and also the challenges which had affected their efforts to provide quality education. These include such factors as teachers, the distribution of physical facilities, adequacy, availability and utilization of teaching and learning materials, regularity of external school inspection, financial constraints, student transfers and student discipline, in-service programmes and community interference.

Interview schedule

Interviews were administered to 42 headteachers of the sampled schools with an aim of getting more information on the challenges they faced in their attempts to provide quality education. Responses from interviews were recorded under headings emerging from interviews with interviewees.

Observation checklist

Information was also gathered through observation of physical facilities and other visible school equipment. This observation helped to verify the responses to questionnaires and interviews. The researchers prepared observation checklist which contained observable school factors related to quality education in secondary schools. The checklist was completed by the researchers during the period when each school in the sample was visited.

Validity and reliability of research instruments

To ascertain the validity of the research instruments, the researchers presented questionnaires, interview schedule guide and observation checklist to three lecturers in the Department of Educational Management and Foundations at Maseno University who are authorities in the area for scrutiny, advice and verification. Validity and reliability were ascertained through piloting instruments of data collection. Researchers conducted a pilot study in nine schools. Questionnaires were administered after intervals of two weeks and information obtained were used to remove or clarify any vague and ambiguous questions in the instrument.

METHODS OF DATA ANALYSIS

The data collected by questionnaires was analyzed using descriptive statistics (frequencies and percentages). Data collected through in-depth interviews were transcribed, organized into themes and sub themes as they emerged in an on going process. The researcher then used statistics to indicate percentages. This helped to capture the challenges and opportunities for headteachers in their attempts to provide quality education.

RESULTS AND DISCUSSION

The goal of the current study was to identify the supervisory strategies employed by secondary school headteachers in the provision of quality education. We also sought to investigate challenges that hampered headteachers efforts to provide quality education.

Supervisory methods employed in public secondary schools

Data indicated that over 80% of public secondary schools headteachers preferred the use of written records (records of work covered, schemes of work, progress records and class attendance register) in the supervision of the curriculum, however, data also indicated that less emphasis was given to departmental supervision, self-appraisal and less than 50% undertook class visits and observation.

Teaching and learning methods in public secondary schools

Headteachers were asked to identify teaching and learning methods which were frequently employed by their teachers. Their responses were summarized in Table 3.

The obtained results revealed that in all public secondary schools teachers preferred using discussions and lecture methods in the teaching and learning processes (Table 3). Other methods such as the use of assignment, investigation, experiment, project and dramatization were employed less frequently.

Challenges experienced by headteachers in their attempts to provide quality education

Data obtained indicated that all the sampled public secondary schools in Gucha district experienced financial constraints, inadequate facilities and teacher shortage while 86.4% faced problems of admission of students with low marks, student absenteeism, transfer and indiscipline. It was also noted that over 80% public schools experienced the problem of community interferences such as demands to have schools headed with their own

Table 2. Curriculum supervisory approaches employed in public secondary schools.

Approaches	Mixed n = 37		Boys' n = 4		Girls' n = 5		Total n = 46	
	No	%	No	%	No	%	No	%
Check records of work	37	100	4	100	5	100	46	100
Schemes of work	37	100	4	100	5	100	46	100
Departmental supervision	11	29.4	4	100	2	40	40	36.9
Check on students' marks	31	83.8	4	100	4	80	39	84.7
Frequent testing	34	91.9	4	100	5	100	44	95.6
Self appraisal	12	32.4	3	75	1	20	16	34.7
Attendance registers	37	100	4	100	5	100	46	100

people with or without the necessary qualifications, withholding fees payments and transferring children from one school to another frequently.

Training

Results indicated that the majority (90%) of headteachers and teachers had undertaken initial training courses (e.g. Diploma and first Degree). It was also noted that a half of headteachers (50%) had received short in-service courses in school and financial management. However, very few (6.4%) headteachers and teachers had managed to further their education to masters level. About 30% of teachers from all schools had received training in the teaching of Science and Mathematics in Secondary Schools Education (SMASSE).

Teacher distribution

Results on the composition of teacher distribution in public schools revealed that overall schools had 20.2% untrained teachers, 11% Approved Teachers, and 9.3% diploma holders. However over a third (37.7%) of the teachers were first degree holders in Arts and 23% in science. Results indicated that schools had a shortage of science teachers, especially in physics and chemistry. It was also reported that in cases of teacher shortages, form 4 school leavers were sometimes employed instead of a qualified teacher.

Physical facility, teaching and learning materials distribution in public schools

Results on facilities indicated that all schools had inadequate physical, learning and teaching materials. The ratio of textbook-pupil was 1:20. It was also reported that over 81.1% Mixed and Girls schools had no essential facilities, such as transport, tapped water and electricity. However, all boys' schools were reported to have adequate transport and water supply. Results also

indicated that all public schools had inadequate guidance and counseling services and over half of headteachers reported that their schools had locally appointed counselors.

Student indiscipline

Data obtained also indicated that schools within the sample experienced similar student indiscipline problems. In boys' schools the major problems were drug abuse (100%), fighting (60%), student absenteeism (75%), disobedience to teachers (75%) and destruction of property (50%). It was also revealed that mixed and girls' schools experienced student absenteeism (97.2%), failure to do assignment (100%), student flirting (60%), disobedience to teachers (80%), and destruction of property (Table 4). The results, however, indicated that common indiscipline problems in public schools were student absenteeism, destruction of property, failure to do assignment and disobedience to teachers.

DISCUSSION

The use of written records as illustrated in Table 2 was headteachers' most preferred method of supervising the curriculum in secondary schools. This present findings illustrate that headteachers found it easy to check on teachers' records due to their accessibility and availability. Headteachers did not employ self-appraisal frequently. This could be due to lack of experience on how to use it successfully or because teachers felt intimidated and victimized by headteachers. On the other hand, this could indicate lack of concern or commitment on the part of headteachers. Lack of departmental supervision could be due to lack of heads of department appointed by the Teachers Service Commission. This could also be the result of headteachers' lack of experience on how to utilize and encourage self-appraisal. Results indicated that there was also a lack of class visits and observation on the part of headteachers. This could be due to either headteachers being

Table 3. Methods of teaching and learning employed in a sample of public secondary schools in Gucha.

Methods	Mixed n=37				Boys n=4				Girls n=5			
	HTs		CMs		HTs		CMs		HTs		CMs	
	f	%	f	%	f	%	f	%	f	%	f	%
Class discussion	37	100	37	100	4	100	4	100	5	100	5	100
Group discussion	37	100	37	100	4	100	4	100	5	100	5	100
Lecture method	29	78.4	23	62.2	3	75	3	75	2	40	3	60
Assignment	16	43.2	14	37.0	2	50	3	75	3	60	1	20
Investigation	3	8.1	6	16	1	25	2	50	1	20	1	20
Project	7	18.5	15	40.0	1	25	2	50	1	20	1	20
Experiment	12	32.4	6	16.0	3	75	3	75	4	80	2	60
Dramatization	2	5.4	10	27	2	50	3	75	1	20	1	20

Table 4. Indiscipline problems experienced in public schools.

Indiscipline problems	Mixed schools n = 37		Boys schools n = 4		Girls schools n = 5		%
	f	%	f	%	f	%	
Drug abuse	15	40.5	4	100	1	20	20
Fighting	13	35.1	4	100	2	40	40
Theft	18	48.6	4	100	3	60	60
Student flirting	18	48.6	1	25	2	40	40
Student absenteeism	36	97.2	3	75	5	100	100
Disobedient to teachers	25	67.5	3	75	4	80	80
Failure to do assignment	37	100	1	25	4	80	80
Destruction of school property	17	45.9	2	50	1	20	20
Use of home clothes	10	27	1	25	4	80	80
Cheating in examination	13	35.1	1	25	3	60	60

committed to administrative functions or ignoring it as well as regarding it as a less important aspect of their supervisory role. However, absence of class visits meant that teachers could decide to attend to their lessons or not. This therefore left headteachers employing the easiest alternative method, that is, the checking of records. This also made strategies of curriculum supervision inefficient and inadequate since they were not balanced between inside and outside teaching and learning venues. This finding is inline with the views given by Nyamu (1986) who observed that supervisory methods employed by headteachers were inadequate since they were limited to checking of teachers' professional records.

The frequent use of discussion and lecture methods could be due to inadequate teaching and learning facilities. It could also be attributed to the nature of learners depending on admissions criteria and lack of frequent in-service training on methodology. Methods of learning and teaching are linked fully on the availability and adequacy of facilities. Use of methods such as class discussions and lecture methods suggest that much of the work was initiated and done by teachers since they could use the very few textbooks, make notes and then

discuss these with the learners. However, this rendered the whole learning process fully teacher-centred. The missing aspect of student assignment, investigation, experiment, project and dramatization illustrates that teaching in most cases was done theoretically and therefore no room was left for discovery on the part of learners. This could be due to lack of facilities for practical teaching. This finding is similar to that of Gogo (2002) who concluded that low performance could be attributed to lack of adequate finance which resulted in inadequate supply of teaching and learning materials and equipment. Lewis (1984) also observed that a shortage of textbooks and teaching materials had harmful effects on satisfactory teaching in mathematics and sciences.

Schools in the sample experienced financial constraints as revealed from the findings. This could be due to non-payment of fees, accumulation of arrears and untapped school resources. This could also be attributed to mismanagement of school funds. The issue of finance is crucial to the provision of quality education since it determines the quality of physical facilities, teaching and learning materials, quality of teacher motivation and teachers employed at the time of shortage. It also impacts on the methods of teaching and learning

employed in schools as they depend to a large extent on the facilities available. It also supported efficient utilization and exploitation of school resources. Hence, many of the problems experienced in schools, such as community interferences, student indiscipline, absenteeism, and transfers, lack of adequate facilities, shortage of teachers, could all be attributed to have stemmed from financial constraints.

Inadequacy of facilities could be due to financial constraints faced by schools. Since mixed schools and girls' depended on the good-will of the parents, especially those from the community, financial constraints probably stemmed from non-payment of fees. Lack of facilities affected the methods of teaching and learning used in schools. Hence, availability of facilities meant that teachers could save time for extra work on the part of students since many of the activities could be done practically. However, this was a missing aspect in most sampled schools. This finding was in-line with the views of Eshiwani (1984), who asserted that availability of classrooms, desks, laboratories; workshops and library were symbols of high education quality. Lewis (1984) also made a similar observation that shortage of textbooks and teaching materials had harmful effects on satisfactory teaching in mathematics and sciences. Mwiria (1985) also suggested that students' performance was affected by the quality and quantity of teaching and learning resources. He noted that schools with adequate facilities such as laboratories stood a better chance of performing better in examinations than poorly equipped schools.

Findings from this research revealed that schools were irregularly visited by quality assurance officer. This could be because of the inaccessibility of some schools or lack of commitment on the part of the respective officers. Lack of visitation is an indication that headteachers did not receive the advisory services which they could expect from the officers, especially on supervisory methods of curriculum implementation. This therefore, meant that every headteacher did things in his or her own way, hence, affecting the universality of a balanced and uniform education for all children in the District.

Findings also revealed that school had inadequate guidance and counseling services. This could be due to either a lack of trained counselors in schools posted specifically to handle students' matters or because of uninterested headteachers in the establishment of such essential services in the schools. However, the counselors in schools were found to be locally appointed, untrained, inexperienced, and had inadequate counseling skills. This eventually had an effect on the smooth running of student discipline in schools. The findings of this study were in line with the observation made by Makinde (1984) who suggested that the trained school counselors had skills and competencies that could assist him/her use the peer groups for beneficial educational purposes in schools. The Constitution of Kenya Review

Commission (CKRC, 2000) maintained that the government should ensure that the guidance and counseling departments in schools were operational with a person who would be always available for the students, if the management of discipline was to succeed in schools. Ndiritu (1996) observed that lack of serious guidance programs was the major cause of dismal academic performance in learning institutions.

Conclusions

Various generalizations can be derived from our study:

- (i). Headteachers employed inadequate methods for the supervision of teachers in the sample schools, preferring to rely on written records to establish the quality of education delivered.
- (ii). Methods of teaching and learning employed in the sample public secondary schools were more teacher-centred and this failed to encourage students to learn by participation and experimentation.
- (iii). Financial constraint was the major challenge faced by headteachers and all other challenges such as inadequate facilities, low quality teachers employed, student absenteeism, student transfers and indiscipline, unexploited resources and lack of in-service training are linked to this.
- (vi). Quality assurance officers had ignored their roles of visiting the sample schools and offering the necessary advice on the improvement of quality of education.

RECOMMENDATIONS

Based on the findings of this study, it was therefore recommended that:

- (i). Secondary school headteachers should take up their roles as quality assurance officers in their schools and ensure that there is adequate departmental supervision.
- (ii). Headteachers should introduce staff appraisal through locally designed forms to enhance standards and engage in evaluative class observation, to ensure that a variety of teaching methods, apart from class discussion, is utilized.
- (iii). Headteachers should devise school income generating projects to alleviate current financial problems that result in student absenteeism, transfers, indiscipline and inadequate facilities.
- (iv). Headteachers should frequently invite quality assurance officers to advise on school affairs and community relationships. The quality assurance officers should also increase the frequency of their visits to schools in Gucha district. The Ministry of Education should devise a timetable of events (an inspection schedule) to be utilized by the headteachers for inspection and evaluation in schools.

(v). Headteachers should be in constant communication with the Teachers service commission to ensure that school receive adequate staffing for the delivery of quality education.

(vi). Headteachers should devise strategies, such as old students' associations and organize communal fund-raisers, to help equip schools for the delivery of quality education.

Suggestion for study research

Headteachers' perceptions of self-evaluation and how it may be encouraged in Gucha secondary schools.

REFERENCES

- Bound G, Lyle Y, Mel A, Gipsie R (1994). *Beyond Total Quality Management towards the Emerging Paradigms*. Singapore: McGraw-Hill, Inc.
- Digolo OD (2003). Response to the paper entitled: "Education Sector Review: How far have we come since independence and what still needs to be done to meet the education needs of all Kenyans". Paper presented in Education conference. Nairobi: Government Press.
- Doharly GD (Ed) (1993). *Developing quality systems in Education*. London: Routledge.
- Eshiwani GS (1993). *Education in Kenya since Independence*. Nairobi: East African Educational publishers Ltd.
- Fraenkel RJ, Wallen EN (1993). *How to design and evaluate Research in Education*. 4th Edition. Illinois: F. E. Peacock Publishers, Inc.
- Gogo JO (2002). "The impact of cost sharing on access, equity and quality of secondary education in Rachuonyo District Kenya." Unpublished M.Ed. Thesis. Maseno University.
- Lewis K (1984). *Quality in Question Curriculum: Issues in Curriculum and Development: Mimeo*.
- Makinde O (1984). *Foundations of Guidance and Counselling*. London: Macmillan Publishers Ltd.
- Mwiria K (1985). "The Harambee school movement: A historical perspective". Unpublished Ph. D.Thesis. University of Wisconsin.
- Ndiritu JK (1996). "An Investigation into the provision of Guidance and Counselling services in Kenyan Secondary Schools. Case Study of Ndaragua division in Nyandarua district" unpublished pot-graduate diploma in Education research project, Kenyatta University.
- Neil C, Kitson J (1996). *Effective Curriculum Management*. New York: Routledge.
- Nyamu ZI (1986). "A study of supervisory strategies employed by primary school headteachers in supervising Teacher Curricular instruction in Northern Division of Nairobi.". Unpublished M.Ed. Thesis, Nairobi University
- Okumbe JA (1987). "Effectiveness of supervision and inspection in selected secondary schools in Kiambu District". Unpublished M.Ed. Thesis, Kenyatta University.
- Olembo JO (1977). "Education Administration, Management and Supervision in Kenya schools" Nairobi, Education lecture Series Vol. 1. Kenyatta University College.
- Olembo JO (1992). "Major Functions of school supervision in Kenya schools". A paper presented in Education Forum, Kenyatta University.
- Republic of Kenya (2000). *Handbook for Inspection of Education Institutions*. Nairobi: Government Printer.
- Shiundu JS, Omulando JS (1992). *Curriculum Theory and Practice in Kenya*. Nairobi: Oxford University Press.

Full Length Research Paper

Teachers and administrators' views on the implementation of career stages in the teaching profession (case of Turkey – Ankara)

Murat Gurkan Gulcan

Faculty of Technical Education, Gazi University, Ankara – Turkey. E-mail: muratgulcan@mynet.com.

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The criteria for teachers' climbing the career steps have been determined with the Law No. 5204, which was enacted in 2004 after long debates about making a career in the teaching profession. In the preamble of the law, it is stated that "teachers' professional and personal development should be ensured on the basis of their seniority, education, and job performance" since "a special importance should be attached to the betterment of teachers' qualifications and status." With the "Teachers' Climbing Up Career Steps Regulation" career steps were defined, and the number of these steps and the conditions of appointment were determined. The purpose of the study is to determine the views of the teachers and administrators on the implementation of career steps. A questionnaire developed for this purpose was conducted on 600 teachers and administrators from 12 schools selected randomly in Ankara Province. The study carried on showed that teachers and administrators do not support the practice in general and that they regard the level of goal realization of the practice and the results of the process unsuccessful.

Key Words: teaching profession, teacher career stages, teachers' professional promotion.

INTRODUCTION

Education is the most important factor which directly or indirectly affects the development level on all indicators. In our era, which is called the information age, one of the important characteristics of societies is to pass on the ways of reaching exponential information to next generations. All over the world, more importance is being attached to education and it is accepted that investing in education means investing in the future of the society.

All over the world, the principles "life-long learning" and "education everywhere" have been embraced, and school, as the most benefited stage in education, and teacher, as the most important element of school, have been accepted as the two important factors in education. Teachers are always expected to develop terminal behaviours in students, to reinforce these behaviours and to shape students at school. It is seen that rapid technological advancements have moved these expectations beyond the determined programmes and imposed many of the roles of families and other social institutions on teachers. This characteristic of the school and education is one of the basic reasons why teaching has become an important profession; therefore, it can be said

that the main responsibility is the teacher's in education.

According to Basaran (1996, p. 14), school has to work efficiently as it is the fundamental system that produces the education service. In order for the school to work efficiently, the school administration should achieve the following objectives:

1. Increasing productivity: Improving student quality.
2. Ensuring the job satisfaction of education workers: Ensuring that educators are gratified by their job since they receive a recompense for their work.
3. Protecting the health of the school: Directing the personnel to work in unity in accordance with the educational objectives by minimizing conflict.
4. Providing a dynamic structure for the school: Implementing novelties pertinaciously and in time.
5. Making the school useful to its environment: Providing the society with appropriate education and leadership in accordance with its requirements.

In Turkey, a developing country, the need for especially moderately and highly trained labour force is increasing

(Celik, 1995). Schools and teachers have been obliged to lead societies to meet the requirement for trained labour force. Therefore, it is accepted that the teaching profession has a little more meaning than being a student. According to Tatlidil (1995, p. 51), the teaching profession is quantitatively more important than other professions. The elite's not having a monopoly on the right to education anymore and the common people's being granted the right to education in parallel with democratic edifice have put schools and teachers at the forefront. In every society, teaching's being perceived as a profession and education's being undertaken by the state have caused teaching to be accepted as a profession. According to this, teacher's job satisfaction is accepted as an important factor which affects the enhancement of quality in education and the effectiveness of school. Individuals (prospective teachers) receive a training to gain some knowledge about the teaching profession. However, only knowledge is not enough to be a good teacher (Tezcan, 1996, p. 279). In the article 43 of the Basic Law on National Education No. 1739, teaching is defined as "a profession which requires specialization and which undertakes the duties related to education and training and the relevant administrative duties of the State." When legal regulations and scientific studies about the teaching profession are taken into consideration as a whole, it is clear that the teaching profession should be a dynamic profession which requires specialization and which should be continuously improved. And specialization means becoming an expert in field and promotion. In order to realize this, a career planning peculiar to the teaching profession is required.

Career is described as the stages one passes through during his/her working life, the tasks he/she has done in these stages, mobility in the process, and knowledge. Although there are different stages in one's career development, this development is actually a process which starts before birth and continues up until death. Career development is affected by universal factors and environmental changes have an effect on career (Bakioglu and Ozcan, 2005, pp. 41- 42).

Teachers' career planning is an important process since it enables each teacher to improve himself/herself in his/her profession, since it offers new opportunities in the working life and since it gives status. Tortop (1994) describes career as one's proceeding step by step and continuously, gaining experience and skills in any line of business during the years he/she can work, and he summarizes the characteristics of the career system as follows:

1. Specialization in a line of business.
2. Improvement and becoming successful.
3. Status' being determined by laws.
4. Placing emphasis on pre- and in-service training in promotion,
5. Placing emphasis on seniority and working time.
6. Taking competences into account.

7. Implementing a wage system in parallel with continuous improvement and promotion.

With the "Recommendation concerning the Status of Teachers", which was prepared cooperatively by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and the International Labour Organization (ILO), a set of common rules and measures have been determined by taking into account the great diversity of the laws, regulations, arrangements, and customs in different countries, and the following basic principles regarding teacher training have been adopted:

1. Education should be directed to the all-round development of the human personality and to the spiritual, moral, social, cultural and economic progress of the community, as well as to the inculcation of deep respect for fundamental freedoms and human rights.
2. It should be accepted that advance in education depends largely on the ability, the human, pedagogical and technical qualities of the individual teachers.
3. The status of teachers should be commensurate with the needs of education as assessed in the light of educational aims and objectives; it should be recognized that the proper status of teachers and due public regard for the profession of teaching are of major importance for the full realization of these aims and objectives.
4. Working conditions for teachers should be such as will best promote effective learning and enable teachers to concentrate on their professional tasks.

As well as similar international decrees and practices, on national level there has been a debate regarding teachers' professional promotion for ages. Some decisions were made about teachers' promotion at the 11th National Education Council meeting, but there were no implementations for a long time. Some recommendations about the issue were also made in some scientific studies. In the doctorate study of Gulcan (2003), there is the following recommendation: "In order to increase teachers' professional success, to encourage personal improvement and to prepare them for higher positions the teaching profession should be classified under titles and career stages such as teacher candidate, teacher, expert teacher and head teacher."

In the career systems where career paths and promotion rules are fixed, enabling workers to improve themselves by gaining different knowledge and skills is of secondary importance, the advancement and improvement of workers are in the administrator's initiative and these can be achieved only by the administrator's own decision (Akçay, 2006, p. 18). It is assumed that the rewarding methods such as a pay rise, promotion and status increase in reply to good performance are enough to increase motivation (Akçay, 2006, p. 19).

The fact that the higher positions workers can climb is limited caused horizontal specialization as an alternative to vertical specialization. Career planning programmes in

institutions play an important role in effective horizontal specialization since they match the needs of the institution and the interests and skills of the workers (as cited in Akcay, 2006). The needs in organizations, personnel qualities, technological developments, and the changes in the understanding of management and career models have caused traditional vertical career models to be replaced by functional organization and career developing models which are horizontal and based on specialization.

Although our country is experienced in teacher training, there are hardly any significant practices about making a career in the teaching profession. In the last two decades, studies, mainly the decrees of National Education Council, to make teaching a profession which requires competency have been very frequently carried out. Until 2004, recommendations and decrees regarding the issue were evaluated and in July 2004, teacher career stages were determined with. In the preamble of the law it is stated that "teachers' professional and personal development should be ensured on the basis of their seniority, education, and job performance" since "a special importance should be attached to the betterment of teachers' qualifications and status." One year later, with the "Teachers' Climbing Up Career Steps Regulation", which was enacted in August 2004, career steps were defined, and the number of these steps and the conditions of appointment were determined. Following these, two examinations were carried out in 2005 and 2006.

The studies and debates carried out after the implementation of Teachers' Climbing Up Career Steps Regulation show that teachers do not regard the practice successful enough. It is also understood that scientific studies on the issue involves significant criticism.

Akcay (2006, p. 21), who studied the effects of the developments in career management after the teaching career practice on the teaching profession, has introduced the following findings:

1. A career practice which is based upon the traditional understanding of career was also applied to the teaching profession.
2. There are fewer higher positions in teaching. And this makes the career system more static and less dynamic.
3. Professional promotion paths have fewer alternatives. It is impossible for teachers to improve themselves unless these alternatives are increased.
4. Professional promotion is (more often) carried out according to subjective conditions based on seniority.

In his study, Akcay (2006, p. 22) makes the following recommendations in the light of his findings:

1. Alternatives regarding professional promotion and becoming an executive should be increased.
2. Professional promotion should be based on an objec-

tive system based on competency, not on a subjective system based on seniority.

3. Teaching career stages should be organized in fields such as educationalist, public education specialist, and education programmer.

4. The number of higher teaching positions should be increased.

In his study, Gumuseli (2005, p. 14) states that "The career stages developed with the regulations as it is has no meaning, except for a hollow title and a limited pay rise. This drawback will have a negative effect on teachers' willingness to climb up the career stages." And in his study, Celikten (2006) expresses that "The purpose is to increase the quality of teaching, to distinguish the ones working and not working, to create a difference between the ones who wants to improve themselves and the ones who resist change, and thus to increase the quality of education.", and in his criticism to the practice he draws attention to the fact that the tasks and roles of the teacher candidate, teacher, expert teacher and head teacher have not been described in the regulations.

When we look at the practices abroad, we see similar practices in some countries such as the USA, Germany, France and Japan. In Germany, the process of entering into the teaching profession and making a career in the profession is generally complex. Although there are different practices in different states in Germany, generally teacher candidates are entitled to become teachers after a two-step (Erste und Zweite Staatsprüfung) examination and they generally become just contracted teachers (Angelstaeter) after a two-year training (Referand). Teachers become permanent teachers (Beamter) after two guidance supports in-service training (Fortbildung) and two supervisions (Visitation) they receive during their contracted teacher status which varies between two to four years. This period may change according to the situation of the teacher and the school and teacher requirement. The joint resolution of the school principal and the Provincial Directorate of Education applies to teachers' professional promotion. The obtained permanent teacher status is tenure.

Teachers who want to improve themselves can become expert teachers-advisory teachers on condition that they meet the requirements as well as studying for master's degree and doctorate degree in their fields. The teachers obtaining this title contribute to on job training by giving guidance to trainee teachers at least twice a year. This guidance, expert teachers offer to trainee teachers, has an important function, which means preparing the teacher for supervision during the process of transition to permanent teaching. In Germany, teachers can make a career as vice principal (Konrektor) and school principal (Rektor) in the school system. In Germany, there is no practice of single-stage exam for professional promotion after obtaining the status of teacher. Instead of this, there is a system based on performance and training.

And when we study the practice in France, we see that teachers have various opportunities for promotion by receiving training during their course of duty and sitting for exams. In France, teaching career stages are as follows (MEB; 2006, p. 291):

1. *Agreje Teacher*: Teachers who get their master's degrees in their fields during their course of duty.
2. *High Chair Teacher*: They are selected among teachers showing excellence during their course of duty.
3. *Formator Teacher*: Teachers receiving the title of "formator" by graduating from the Higher Institute for Initial Teacher Training.
4. *School Principal*: The ones appointed as school principal after completing the related courses and being appointed as vice principal.

When the practices in Germany and France are reviewed, it is seen that the teaching profession is not static, teachers who want to make a career are given chances, making a career is based on success and training rather than exams, and that teaching career stages are associated with administration.

When the practice was compared to the practices abroad and the teachers were interviewed, it was found out that the practice of teachers' career stages is both necessary and useful; however, the process has been problematic. The following sub-problems were formed after consulting the relevant literature and the interviews:

1. Selection could not be made according to standard and objective criteria.
2. Teachers' career stage job descriptions were not made, and responsibilities, capacities, and roles were not set.
3. Equal and fair application terms could not be set for promotion.
4. Exams could not be carried out with appropriate measurement and evaluation methods and techniques, and context which are in accordance with teachers' job descriptions.
5. There is no continuity of the practice.
6. Quota restrictions had a negative effect on the number of applicants.
7. The practice has become litigation.
8. It has caused some divergences among teachers.
9. The exam results, the rights and the documents of the ones who passed the exam were delivered to the teachers late.
10. Titles have not been used by the ones who acquired them.
11. The competencies of some fields such as foreign language and mathematics were not used as criteria.
12. The time required for the practice was not used well. The process was railroaded.

When the said debates are taken into consideration together, although they are not clearly stated in the re-

lated law and regulations, the objectives of the practice of teaching career stages could be expressed as follows:

1. To develop a payment system for teachers which is based upon success and performance.
2. To provide teachers with the opportunity for professional promotion.
3. To develop a model and mechanism supporting teachers' professional development.

The following sub-problems related to the implemented model could be formed to support teachers' professional development with a practice that is continuous, permanent and open to improvement:

1. Does the implemented models support the career system; is it in accordance with the objectives of the career stages; what is the level of goal realization of the practice?
2. What are the views of teachers on the implementation process of career stages?

The aim of the study

The aim of this study is to have teachers, expert teachers, head teachers and administrators' view on the "Teachers' Climbing Up Career Steps Regulation" ("Ogretmenlerin Kariyer Basamaklarında Yükselme Yönetmeliği") and the practice, to determine if there is a difference between these views, and if there is a difference, to identify the reasons for it, and to offer some solutions to the problematic issues.

METHOD

The descriptive survey method was used in this study. The population of the study comprises of teachers and administrators working in Ankara. Since the number of teachers (41.000) is high, sampling was used. The sample of the study consisted of teachers, expert teachers, head teachers and school administrators working at 12 schools selected randomly among the schools in Ankara Metropolitan Municipality. The developed questionnaire was sent to 600 personnel at 12 schools and 422 questionnaires were returned. A questionnaire was used to collect data for the study. The questionnaire consists of three parts. The six questions in the first part comprise the participants' independent variables such as seniority, gender, and branch. In the second part, there are questions to identify the teachers' perception of career stages, and to identify if the implemented model supports the career system and if the career stages are in accordance with the objectives of the career stages in the teachers' opinion. And the third part consists of questions to identify teachers' views on the level of goal realization of the practice and how the implementation process was carried out.

The questions in the developed questionnaire were based on the opinions of a limited number of teachers interviewed, scientific studies, views in the websites of some teacher institutions, and the texts in the practice manual. The first draft of the questionnaire consisting of 30 questions was reviewed by the experts. Accordingly, two questions were combined, four questions were omitted

Table 1. If the implemented model supports the career system; if it is in accordance with the objectives of the career stages; and the level of goal realization of the practice.

Items about the regulations regarding teachers' career stages and the implementation process	Disagree		Agree	
	F	%	F	%
1. Teachers' motivation has increased since it ensures professional promotion.	260	61.6	35	8.3
2. It has increased the social status of the teacher.	315	74.6	16	3.8
3. It has given teachers the opportunity and the occasion to use their skills and talents.	287	68.0	17	4.0
4. Expert teachers or head teachers work more willingly.	314	74.4	21	5.0
5. Teachers have better adopted themselves to changes.	274	64.9	25	5.9
6. It has increased teachers' willingness for professional development.	263	62.3	27	6.4
7. Teachers' knowing their promotional chances has increased their willingness to work.	253	60.0	26	6.1
8. It has provided teachers with an opportunity for development and equality of changes.	290	68.7	26	6.1
9. The practice has caused some divergences among teachers.	148	35.1	132	31.3
10. The practice has increased teachers' job satisfaction and morale.	264	62.6	19	4.5
Total mean	267	66.4	34.4	7.5

and a 25-question test was developed. Participants' views on the items were assessed through the 5-point Likert-type scale in the form of "Completely Disagree" (1), "Slightly Agree" (2), "Mildly Agree" (3), "Strongly Agree" (4) and "Completely Agree" (5).

The data obtained was analyzed using the SPSS program. Then, the mean and standard deviation of the data was calculated and the variations between the groups were analyzed using the "t" test.

FINDINGS AND INTERPRETATION

1. Does the implemented models support the career system; is it in accordance with the objectives of the career stages; what is the level of goal realization of the practice?

For the first sub-problem of the study, teachers and administrators' views were categorized into two groups according to their responses for the first 10 items of the questionnaire. The ones choosing "Completely Disagree" were regarded as "Disagree" while the ones choosing "Strongly Agree" or "Completely Agree" were regarded as "Agree". The frequency and the percentage of the respondents who agree and who disagree with the questions related to the model were given in Table 1 (Item 9 is a reverse item, so the data was corrected).

When the data related to if the implemented model supports the career system; if it is in accordance with the objectives of the career stages; and to the level of goal realization of the practice is analyzed, it can be stated that 66.4% of the teachers and administrators participated in the study perceive the model to be unsuccessful whereas only 7.5% of them perceive it to be successful.

2. What are the views of teachers on the implementation process of career stages?

For the second sub-problem of the study, teachers and administrators' views were categorized into two groups according to their responses for the last 15 items (items 11 - 25) of the questionnaire. The ones choosing "Completely Disagree" were regarded as "Disagree" while

the ones choosing "Strongly Agree" or "Completely Agree" were regarded as "Agree". The frequency and the percentage of the respondents who agree and who disagree with the questions related to the implementation process of the practice were given in Table 2 (Items 21 and 22 are reverse items, so the data was corrected).

When the data related to the implementation process of teachers' climbing up the career stages is analyzed, it can be stated that 64% of the teachers and administrators participated in the study perceive the process to be unsuccessful, whereas, only 7.6% of them perceive it to be successful.

3. Differences between groups according to the participants' responses to the questions: (a) When the results of single variance analysis with respect to the variable "seniority" were compared according to the total points, it was seen that variances were not homogeneous; therefore, complete digit series were used in the Post Hoc test (Table 3).

When the results with regard to the variable "seniority" were examined, a significant difference was found between the group means ($0.013 < 0.05$). This difference was caused by the teachers who are in the group of (3) 15 - 21 years of seniority and who are in the group of (5) 29 years and more of seniority.

According to this, senior teachers did not agree with the items related to the process of the teaching career stages practice and the implementation of the developed model ($X = 44.46$) while the teachers with moderate seniority agreed more ($X = 50.46$). And the teachers who started their post recently agreed at a moderate level ($X = 49.51$).

(b) With regard to the variable "gender", there was no significant difference between the total points (Female $X = 47.04$, Male $X = 47.82$) ($t = 0.594 > 0.05$).

(c) When examining the total points with regard to the variable "position", the results of Group 3 were not taken into consideration since only two head teachers partici-

Table 2. Teachers' views on the implementation process of career stages.

Items about the developed model regarding teachers' career stages	Disagree		Agree	
	F	%	F	%
11. The time required for the practice was used well.	298	70.6	17	4.1
12. It had a negative effect on the teachers who failed the exams.	97	23.0	194	4.6
13. Varied salary policy caused teachers to develop themselves.	264	62.6	46	19.0
14. The exam results, the rights and the documents of the ones who passed the exam were delivered to the teachers on time.	179	42.4	75	17.8
15. Varied salary payments for the acquired titles are sufficient and satisfying.	307	72.7	14	3.3
16. Exams were carried out according to standard and objective criteria.	266	63.0	33	7.8
17. Career stage job descriptions were made, and responsibilities and capacities were set.	271	64.2	44	10.4
18. Equal and fair application terms were set for promotion.	268	63.5	44	10.4
19. Exams were carried out in accordance with teachers' job descriptions.	272	64.5	23	5.4
20. Continuity of the practice was ensured.	295	69.9	17	4.0
21. Quota restrictions did not have a positive effect on the number of applicants.	292	69.2	57	13.5
22. Teachers did not complain about the practice.	335	78.3	25	5.9
23. Teachers had been trained before they took the exam.	367	87.0	14	3.3
24. Collaboration with teacher organizations was made.	331	78.4	12	2.8
25. Teachers used the titles they acquired and they were satisfied with it.	291	69.0	24	5.7
Total mean	275	64.0	43	7.6

Table 3. N, X and difference between groups with respect to the variable "seniority" - Post hoc test.

Years	N	X	S	2	3	4	5	Sig.
1 - 7	39	49.41	12.45	4.39	- 1.07	1.29	4.95	0.13
8 - 14	84	45.02	11.78		- 5.96	- 3.10	0.56	
15 - 21	101	50.49	15.49			2.36	6.02*	
22 - 28	96	48.13	15.46				3.66	
29 and more	102	44.46	13.09					
Total	422	47.31	14.12					

pated in the study. When the results of single variance analysis with respect to the variable "position" were compared according to the total points, it was seen that variances were not homogeneous; therefore, complete digit series were used in the Post Hoc test. With regard to the variable "position", a significant difference was found between the total points (Table 4).

When the results with regard to the variable "position" were examined, a significant difference was found between the group means ($0.00 < 0.05$). The difference was caused by the points of Group 1 (teachers) and Group 2 (expert teachers).

According to this, teachers did not agree with the items related to the process of the teaching career stages practice and the implementation of the developed model ($X = 44.43$) while expert teachers agreed more ($X = 60.42$). And administrators had a total point ($X = 48.81$) close to the teachers'.

Expert teachers supported the process and the model while teachers and administrators did not.

(d) When the total points with regard to the variable "gra-

duation" were examined, it was seen that variances were homogeneous and a significant difference was found according to the Tuckey Test results (Table 5).

When the points with regard to the variable "graduation" were examined, a significant difference was found between the group means ($0.00 < 0.05$). According to this, the point averages of the ones having an associate degree and the ones having an undergraduate degree were close to each other ($X = 43.91 - 48.64$) whereas, the points of the ones having a postgraduate degree were high ($X = 58.07$). According to this, the ones having an associate degree and the ones having an undergraduate degree did not support the process of the teaching career stages practice and the implementation of the developed model while the ones having a postgraduate degree supported these at a moderate level.

(e) No significant difference was found between the group means with regard to the teachers and administrators' knowledge level and Views on the process of teaching career stages practice and the implementation of the developed model ($0.076 > 0.05$).

Table 4. The table of N, X and difference between groups with respect to the variable "position" - Post hoc test.

	N	X	S	2	4	Sig.
1. Teacher	335	44.63	11.88	- 15.80*	- 4.18	0.00
2. Expert teacher	66	60.42	17.10		11.62*	
3. Administrator	21	48.81	14.17			
Total	420	47.31	14.12			

Table 5. N, X and difference between groups with respect to the variable "graduation" - Post hoc test (Tukey HSD).

	N	X	S	2	3	4	Sig.
1. Associate degree	79	43.91	11.81	- 2.59	- 4.73	- 14.16*	0.00
2. Undergraduate degree (Education faculty)	212	46.50	13.98		- 2.14	- 11.57*	
3. Undergraduate degree (Other)	103	48.64	13.77			- 9.43*	
4. Postgraduate degree	28	58.07	17.22				
Total	422	47.31	14.121				

Table 6. The table of N, X, and difference between groups with respect to the variable "taking the examination" - Post hoc test (Tukey HSD).

	N	X	S	Sig.
1. Those who did not take the examination	325	45.18	11.81	0.00
2. Those who took the examination	90	54.54	13.98	
Total	415	50.09	12.77	

(f) When the total points with respect to the variable "taking the examination" were examined, non-parametric test was used since the variances between groups were not homogeneous (Table 6).

When the points with regard to the variable "taking the examination" was examined, a significant difference was found between the group means ($0.00 < 0.05$). According to this, the teachers and administrators who took the examination supported the process and the model more than the ones who did not take the examination.

Conclusion and Recommendations

As a result of the study, it was found out that the teaching career stages practices were not supported by teachers and administrators. As a result of the study, the findings obtained and recommendations with regard to the replies given to the questions asked to teachers and administrators are presented below:

1. Motivation and the social status of the teachers has not increased. Teachers did not use the titles they acquired in their daily lives and they were not satisfied with it. Teachers should be given the opportunity of using their titles
2. Varied salary policy did not cause teachers to develop themselves. Varied salary payments for the acquired

titles are not sufficient and satisfying. The difference of the salaries between the career stages should be increased to a sufficient and satisfying level.

3. Long-term plans should be made about the "Teachers' Climbing Up Career Steps Regulation". Exams should be carried out after giving teachers enough formation (training) by collaborating with universities.

4. It should be carried into practice after enough collaboration with teacher organizations (unions, associations and etc.). The exam should not be a single-stage and multiple choice exam; it should be a three-stage exam which also includes hands-on practice and interview.

5. For each teachers' career stage, job descriptions should be made. The practices carried out in European countries should be examined to achieve this (for instance, expert teachers' giving guidance to trainee teachers during their probationary period).

6. Quota restrictions should be eliminated and replaced by competencies and minimum criteria. Quota restrictions implemented in accordance with the branches may have a negative effect on the teachers' willingness and achievement motive to climb up the career stages.

7. Part of the teachers have not found the implementation process safe enough. If the selection process is implemented without establishing a safe environment, factions may arise within the teachers. First of all, a safe environment should be provided for an objective practice.

8. Seniority restrictions developed for the teachers and

administrators to climb the career steps may have a negative effect on the young teachers. Professional experience may be demanded from the teachers who started their post recently. Despite the fact that it is not appropriate to eliminate the seniority restriction, it should be reevaluated.

9. It has negative effects on some branches that the majority of the questions are from social and linguistic sciences in the exams. For this reason, branch expertise (Foreign language expert, Maths expert, Computer expert, and etc) should be offered to teachers as an alternative.

10. Continuity of practice should be paid attention (an exam every two years and etc.). The practice has not been repeated from the time of the research. This kind of practices should be carried out periodically and declared publicly. The teachers do not have information on the time of the next exam.

As a result, it is determined that while the teachers and administrators in the large city centers have titles because of their seniority, few teachers and administrators in relatively small residential areas have titles. Therefore, quotas should be set according to the residential areas and accumulation of teachers in some locations should be prevented.

REFERENCES

- Akcay C (2006). "The Problems of Teaching Profession Which Are Caused By Contemporary Changes in Career Management and a Career System Model" *Eurasian Journal of Educational Research*, 18pp, Ankara.
- Bakioglu A, Ozcan K (2005). "Career Development of Primary School Principals" *Educational Sciences: Theory & Practice (ESTP)*, Istanbul.
- Balci A (2007). *Comparative Education Systems*, Pegem Academy Publishing Company, Ankara.
- Basaran IE (1996). *Education Management*, Yargi Publishing Company, Ankara.
- Bursalioglu Z (1999). *New Structure and Approach in School Management*, Pegem Academy Publishing Company, Ankara.
- Celik S (1995). "Labor Force in Turkey, Employment and Structural Characteristics" *Kastamonu Education Journal*.
- Celikten M (2006). "Search for New Model in the Teaching Profession" 3rd International Symposium on Teacher Training, Canakkale.
- Dagli A (2007). "The Conception of Elementary Education Teachers about the Promotion System on the Steps of Teaching Career" *Electronic Journal of Social Sciences - C.6 S.22* (184-197).
- Gulcan MG (2003). *The Structural Problems of Turkish Educational System in The Process of Candidacy to the European Union and Structural Adaptation Model Study* (Ankara University, Institute of Educational Sciences Doctoral Thesis) Ankara.
- Gulcan MG (2005). *European Union and Education Process*, Ani Publishing Company, Ankara.
- Gumuseli A (2005). "Criticism on the Career System of Teaching Post", *Arti Egitim Journal*.
- Law no 5204 on Amendments to the National Education Fundamental Law and Civil Servants Law, Official Gazette dated July 8, 2004, Ankara.
- Ministry of National Education (2006), *Teacher Training Systems of Countries*, State Publishing, Ankara.
- National Education Fundamental Law numbered 1739, Official Gazette dated June 24, 1973, Ankara.
- Tatlidil E (1993). "A Research on the Society, Education, Teacher and Teacher Candidates" *Publications of Ege University Faculty of Letters*, Izmir.
- Tezcan M (1996). *Sociology of Education*, Feryal Publishing Company, Ankara.
- Tortop N (1994). *Management of Personnel*, Yargi Publishing Company, Ankara.
- Regulation on Teachers' Climbing Up Career Steps, Official Gazette dated August 13, 2005.
- Sonmez V (2003). "Historical Fundamentals of Education" *Introduction to Teaching Profession*, Ani Publishing Company, Ankara.



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