4

ISSUES IN
EDUCATIONAL MEASUREMENT AND EVALUATION IN NIGERIA

In Honour of

WOLE FALAYAJO

Edited by

Omaze A. Afemikhe
J. Gbenga Adewale

ISSUES IN EDUCATIONAL MEASUREMENT AND EVALUATION IN NIGERIA

Papers in honour of

Professor Wole Falayajo

2004

Educational Research and Study Group
Institute of Education,
University of Ibadan,
Ibadan. Nigeria.

© O. A. Afemikhe & J. G. Adewale, 2004

Printed in Nigeria.

ISSUES IN

EDUCATIONAL MEASUREMENT
AND EVALUATION IN NIGERIA

In
Honour of

'WOLE FALAYAJO

Edited by:

Omaze A. Afemikhe

J. Gbenga Adewale

Contents

Section Two: Teacher Education

Section Three: Science Education

Section Four: Programme Evaluation

Section Five: Measurement and Evaluation

19

METHODOLOGICAL CHALLENGES IN CONDUCTING PRESCHOOL-BASED NATIONAL STUDIES ON CLASSROOM INTERACTION PATTERNS IN NIGERIA

Monica N. Odinko

Background

The import of quality interactions in children's classroom is based on socio-cultural theories of cognitive development and teaching respectively. According to National Research Council (2000), advances in cognitive abilities take place in the context of the child's active interaction with others and with the environment. Such a conceptualization is also shared by Light and Littleton (1999) and Barbara (2001) who indicated that cognitive development is fundamentally constituted in discourse/social process; and through the use of tools and artifacts. Contemporary researches also encourage methods of teaching that is rooted in learner-centered interactions involving teacher-learner, teacher-material, learner-learner and learner-material interaction patterns within a context (Hayes, 1999; Okpala, 2002; Lybolt and Gottfred, 2004). The children should be exploring, manipulating, observing, questioning, reading, telling stories, singing and recording their findings and observations through talk, paintings, drawings and writing (Katz, 1987; Onocha and Okpala, 1990; Akinbote, et. al, 2002). Inspite of these, most of the research findings on early childhood education in Nigeria focus on the outcome variables of the programmes (Haggai,

2000). Information on process variables, which focus on characteristics and quality of instruction and care provided to young children in Nigerian preschool settings, seem to be lacking. There is therefore a need for intensive and extensive preschool-based national studies on classroom interaction patterns in Nigeria. Such studies, however, are associated with methodological challenges that need to be tackled in the course of the research process.

Design Challenges

The theoretical basis of studies on classroom interaction patterns in preschool settings presents a methodological challenge. Such studies seek to promote quality interactions in preschool classrooms in Nigeria. However, the notion that quality interaction is very important in preschool classrooms is based on socio-cultural theories of cognitive development and teaching respectively. For instance, Vygotsky's theory was an attempt to explain consciousness as the end product of socialization. The theory has provided the basis for principles that emphasize that: cognitive development is limited to a certain range at any given age; and full cognitive development requires social interaction. Again, the domain – specific theory of Karmiloff – Smith (1992) shares the view that cognitive development applies within specific domains of language, science, numbers, etc as against the domain-general view of Piaget's theory that development applies across all aspects of the cognitive system (language, numbers, science, etc) in a similar way. The theory also recognises an innate basis for cognitive development which can be specified in details or skeletally (a condition that determines the extent of environmental influence on cognitive development). A minimum environmental influence is associated with detailed specification of the innate component of cognitive development while a maximum environmental influence is associated with skeletal specification. The domain – specific theory supports Piaget's epigenetic–constructivist view of cognitive development but within a domain specific framework.

However, contemporary researchers on cognitive development place much emphasis on social – interaction hence the views of Brunner (1996), Valsiner (1997) and Light and Littleton (1999) that learning is culturally based and not just culturally influenced. It would thus seem that these cognitive development theories and the associated research that emanate from Europe are culture – sensitive (i.e; contextualized within European culture). In consequence, much of the theories and the research findings

may not have as much applicability in Nigerian socio – cultural settings as they would have in Europe. It is more so when research activities and responses focusing on social interaction learning are culturally – based (Light and Littleton, 1999). This view is also corroborated by Burman (1999) who described developmental psychology as a discipline that is tied to the culture which produced it.

The fore-going underscore the need to contextualize the research process of classroom interaction studies and the interpretation of the associated results. In other words, in a multicultural African setting like Nigeria, it is necessary for meaning of events, phenomena or behaviours (e.g. classroom social – interaction learning) to be interpreted in terms of the context in which they occur. Therefore, a tangible methodological challenge in conducting national studies on classroom interaction patterns is hinged on the need for the studies to evolve acceptable criteria for evaluating the profiles of the interaction patterns in preschool classrooms that are rooted in varied cultural settings in Nigeria. The researchers should tackle this challenge by making efforts to ensure that the profiles' evaluation process and criteria take into consideration the specific historical, institutional and cultural contents associated with each social – interaction learning setting.

One of the challenges the researchers are likely to encounter is that of dearth of theoretical and empirical volumes of essential library and bibliographic resources, particularly the Nigerian – based sources on teaching preschool children. These volumes are considered critical for quality literature review and for contextualizing the theoretical framework of classroom interaction studies. In this light, Jansen (2004) observed that most researchers in Africa (Nigeria inclusive) have noted that the libraries in African countries are underdeveloped and library services provided, like interlibrary loans, are often not as efficient as they ought to be. Next to this is the lack of current issues of journals. This could be frustrating to researchers eager to locate their research within the broader field of inquiry (Jansen, 2004). The solution that seems to be available to investigators is the use of internet and internet–based electronic retrieval systems. However, one could even be frustrated the more because more often than not, the systems are usually off–line, unavailable, and when they are available, they appear very expensive and slow to access. Another major deterring factor of the internet is the epileptic nature of electricity supply in Nigeria. The fact is that, the power is not always generated, and in most situations when it is

generated, the supply is so low that it will be unable to carry any electrical appliances. To alleviate this challenge, investigators should consult most documentation centres/libraries and researchers in Early Childhood Care and Development (ECCD) in Nigeria. This perhaps will be a good supplement to the use of internet and internet-based electronic retrieval system.

Another issue which will pose a challenge for preschool-based studies on classroom interaction patterns is that of language. Nigeria has many language groups and the national policy on education had stipulated that children at the preschool age level (3 – 5 years) be taught in the language of their immediate environment. Thus, a researcher interested in evaluating social – interaction learning in Nigerian pre-primary school classrooms has to cope with the challenge of translation in a multi-language educational environment. The challenge may result in relevant information being "lost in transition – culturally, socially and intellectually" (Jansen, 2004:6). To tackle this problem, investigators should be assisted by observers who are conversant with both English language and the Nigerian language of the environment of the participating preschool institution. As part of the preparation for the field work, these observers should be trained on the technicalities of how to use the proposed observation instruments in collecting evidence. The training should seek to achieve high inter-observer and intra-observer reliability estimates. In addition, the investigators should endeavour to use video tape recorder to cover the classroom activities of the observed lessons. This procedure will provide opportunities for a second observer who is conversant with the Nigerian language of the preschool environment to review the tapped lessons and validate the recordings made during the original observation

The problem of restricted access to official information/data considered relevant to designing and implementing the studies will present a challenge to the investigator. In Nigeria, States and Local government officials perceive educational statistics at the pre-primary and primary levels (e.g. enrolment figures, number of schools and teachers) as politically sensitive considering that these statistics are tied to federal government financial allocations to the States and Local Government Areas (LGAs). Thus, a researcher in Nigerian educational setting has to battle with a lot of government bureaucratic scrutiny before having substantial access to valid and reliable data on number of pre-primary and primary schools and the associated enrolment figures. The investigators, perhaps, will need such

educational statistics in order to situate the proposed sampling procedure and sample within a known and defined target population distribution. To overcome this challenge, investigators should make requests to the government establishments in charge of educational statistics at the federal, state and local government levels. Discussions should be held with relevant government officials on the potential contributions of the studies towards improving the quality of pre-primary and primary education in the country. The discussion should also seek to solicit the cooperation and informed consent of the officials in providing the educational statistics considered relevant for effective planning and implementation of the studies.

Another methodological challenge is that of getting a representative sample. In terms of size and diversity, Nigeria is a fairly big country that consists of 36 states and the Federal Capital Territory (FCT). The country is also characterized by multi-cultural and multi-linguistic groups. Thus, the size and diversity of the country will likely present a challenge that needs to be considered if the study is to achieve a school sample that is representative of the various states/FCT and cultural/linguistic groups. In tackling this challenge, however, the investigators should employ a multi-stage stratified random sampling procedure in the selection of schools that will participate in the study. Thus, the 36 states and the FCT should be stratified along six geo-political zones: North East (NE); North West (NW); North Central (NC); South East (SE); South West (SW) and South South (SS). Some states (at least two) should be randomly selected to represent each zone.

The school and classes/teachers should be selected as follows:

- ❖ From each selected state, a fixed proportion (about 10%) of the schools should be randomly picked in such a way as to ensure that location (urban/rural) as well as ownership of schools (private/ public) is reflected.
- ❖ In each selected school, a nursery class should be randomly picked (or the only nursery class should be selected) to participate in the study.
- ❖ The teachers of the selected classes are expected to participate in the study.

The research will also experience challenges that focus on instrumentation. For a study that is focused on evaluation of classroom interaction patterns in varied preschool settings in Nigeria, the investigators should collect

evidence on the relevant variables through the use of observational technique. Observation, as a research technique, is a systematic watching of events and collecting information on the events that are of potential significance to the proposed research questions (Manstead and Semin, 1996). It can be either structured or unstructured. Structured observations should be used for studies on classroom interaction patterns.

The choice is based on the following characteristics of structured observation:

- Specific and standardized evaluation criteria in order to minimize extreme variations in the criteria as well as observer inference in the course of collecting evidence (Kerlinger and Lee, 2000);
- High inter-observer and intra-observer reliability in collecting and interpreting information on interaction patterns (Li and Lautenschlager, 1997); and
- High adaptability for collecting evidence for classroom interaction process analysis with a view to describing and assessing quality of teaching strategies (Simpson and Tuson, 2003).

These characteristics are considered very important in producing valid, comparable and generalizable evaluation results across the different pre-primary school settings to be involved in the study. In addition, practising teachers and teacher-trainees in Nigeria tend to be more positively disposed towards the use of structured observation in providing feedbacks to facilitate the quality of interaction patterns associated with their lessons (Okpala, 2001). This disposition augurs well for such studies considering that thier results are expected to provide, among other things, empirical bases for designing and implementing counselling, training and retraining programmes aimed at improving the quality of classroom interaction patterns of preschool teachers/caregivers in the country.

However, the extent to which the study will benefit from the use of structured observation instruments are subject to the following challenges associated with the development and use of the instruments. The extent to which:

- behaviours are to be correctly assigned to categories;
- the categories are to be exhaustive and mutually exclusive.

- the presence of the observer can affect the objects of the observation (teacher/caregivers and pupils); and
- precision and clarity are associated with the variables being measured/observed behaviourally;

In the course of collecting evidence in the study, an observer is expected to stay within the classroom of the observed teachers and pupils. This action is not only seen as an intrusion into the privacy of other peoples' work life, but also raises the question of whether the very presence of the observer in the classroom environment will have serious distorting effects on what is being observed. There is a likelihood that the teachers and pupils may exhibit unnatural and atypical behavioural patterns due to the presence of the observer and this may distort the validity of the evidence to be collected. The process of collecting evidence also requires the observer to identify and classify classroom behaviours of teachers and pupils along the various categories and sub-categories of the observation instruments. Thus, the following questions are considered very pertinent: how precise and clear are the variables of interest? Are the variables sufficiently defined operationally (behaviourally) such that the observer can distinguish among the behaviours depicting the variables?

In consequence, the investigators should seek ways to reduce the possible impact of the afore-listed sources of methodological challenges. In the case of the observer's effect, the implementation of the study should require the observers to pay prior visits to the teachers and pupils in their classroom setting. Such visits will enable the observers to get acclimatized with the teachers and children before the real observation days. The visits prior to the actual observation days will also allow the teachers and the pupils to get used to the observer and thus pay minimal attention to his/her presence during the actual lesson observations. Again, Kerlinger and Lee (2002), in contributing towards providing solutions to the problem of observer's effect, had noted that the effect of an observer's presence on the object of observation should not be a severe one for an initiated (trained) observer who is expected to be unobtrusive and not to give the person being observed the feeling that judgements are being made. In the same light, Babbie (1995) indicated that a good protection to the observer effect is provided if the observer is knowledgeable and sensitive to the problems his/her presence can create. It is thus imperative that the collection of evidence in such studies should be carried out by knowledgeable and trained individuals only. In addition, the researcher should make efforts

(through further consultations with experts in instrumentation) to ensure that the observation instruments have items and behaviour categories that are precise, clear, exhaustive, mutually exclusive and pilot-tested before using them to collect evidence during field work for the main study. The essence is to conduct the study with a set of observation instrument that are of high quality.

Studies on classroom interaction patterns are also likely to make use of rating scales. Thus, the constant rating error of halo effect that may be associated with obtaining the relevant information using the rating scales may also present a methodological challenge. This type of error is an intrinsic defect of rating scales. As noted by Okpala, Onocha and Oyedeji (1994), such a constant or biased error can manifest in three ways: error of severity; error of leniency; and error of central tendency. The error of severity is associated with observers who tend to rate too low in all the scale points, while the error of leniency is associated with observers who tend to rate too high in all the scale points. However, the error of central tendency is particularly associated with observers who appear to be unfamiliar with the attributes being rated. In order to cope with these possible manifestations of halo effect, the investigators should ensure that any rating scale in use has good characteristics, is trial-/pilot-tested and is used with care by highly trained and skilled observers during the main data collection exercise. In the same light, efforts should also be made to ensure that the data generated with the rating scale are put to appropriate statistical analysis.

In using the observation instruments, the study should adopt a time sampling approach to obtain evidence on classroom interaction patterns. This approach has the important advantage of increasing the possibility of obtaining representative samples of classroom interaction patterns. However, the approach poses a methodological challenge because the identified advantage holds only for interactions that tend to occur fairly frequently. In a time sampling approach, interactions that do not occur frequently have a high chance of escaping being observed and recorded. Yet the need to add more value to the results of the study makes it important for the observer to be also interested in some classroom interactions (e.g. those that border on hostile, creative and sympathetic behaviours) that may not be occurring frequently. Therefore, to increase the chances of capturing such infrequent interactions, the investigators should observe a particular teacher/caregiver during the teaching of different lessons each lasting for a

period of time. This, however, is against the background of the time and resources available for the field work as well as the need to obtain a representative sample of the interaction patterns in the defined target population of the study.

Ethical Issues Challenges

Some of the challenges to be faced in the conduct of the study have to do with ethical issues and the associated fears from the ministry of education officials, head teachers, teachers and parents of the children whose classes are to be observed. For instance, the ministry of education officials may think that the research activities will cause disruption to the routine activities of the participating schools. The head teachers of the schools may feel that the research study will expose the inadequacies of the school management while the class teachers whose class lessons are to be observed may think that the observations will lead to passing summative judgements on the teaching-learning activities of their classes. The head teachers and the teachers may also think that the research report could be used by the ministry of education officials as the basis for punishing them for any inadequacies highlighted by the research report. In addition, the head teachers, teachers and parents of the children whose classes will be used are likely to be concerned with how the research will ensure anonymity and confidentiality of the research information sources. All these alledged fears and concerns will, no doubt, pose tangible challenges to the field activity (information gathering) stage of the research implementation. More specifically, the challenges will border on getting informed consent from key participants in the research, the issue of anonymity, that of confidentiality and others.

Informed consent

Issues of informed consent are to do with acquainting the would be gatekeepers in the information collection sites with what one is working on, how one wants to go about it and when; and then seek their approval. Seeking for consent will require the researcher getting a valid letter of introduction duly signed and stamped to assure the would-be gatekeepers that the information to be collected is meant for research purposes only. With the letter, the researcher should introduce herself/himself to the gatekeepers and explain the purpose of the visit. This will include nature of the research (title and aims of the research), the target audience and the

extent to which the children and their teachers will be involved, number of schools to be covered, area of coverage (urban, rural), school type to be represented (public and private preschools), and length of time to be spent in every school. Copies of the instruments to be used should also be given to them to scrutinize and the method of information collection should be discussed. At this stage, the use of video/audio tape recording device during the observation activities should be discussed. Thus, audio/video tapes should only be used if the gatekeepers consent. Since the study should have a national spread, consents will be sought through a lot of key stakeholders in the education sector in Nigeria. Considering that the country's system of government has three tiers; the Federal, the State and the Local Government levels, permission should be sought along these levels through their respective education departments. At the Federal Government level, the office of the Minister of education should be informed through the Universal Basic Education (UBE) Commission. If permission is granted at this level, then the research should seek the consent of the education office at the State Government levels. In each State to be used, approval should be obtained via the State Primary Education Board (SPEB). At the Local Government Level, consent should be sought through the Local Inspectorate of Education (LIE). If approved, a list of schools registered and approved by them should be collected and those that are likely to be used singled out.

In each of the selected schools, permission should be sought through the head teacher and the teacher whose class has been selected. The process of seeking permission should involve discussing with the head teachers and the class teachers on the essence of the research work particularly how the research will help to improve the quality of teaching-learning in their preschool classrooms. Further explanations should be given on the nature of observation in terms of the length of time to be spent and the kind of instruments to be used. The field- work can only take place in the selected schools that consented to the details of the data collection procedure. As a result, more than the required number of schools should be selected to provide sufficient room for replacement in case some of the selected schools fail to consent to participating in the study. However, care should be taken not to tell them of the day on which the observation will take place. This is to reduce artificiality (producing very unnatural and untypical interaction patterns) The consent of parents of the children whose classes will be used should be obtained through the schools. To achieve this, letters

should be written to the parents via the schools, dul, signed by the head teacher and the class teacher and delivered by the children. It is believed that the vulnerable nature of the children will make it impossible for them to give approval on whether to participate or not. Therefore, the children's consent should be sought from their respective parents as well as head teachers and class teachers who serve as their gatekeepers, in terms of protecting them from harm and exploitation while in school (Masson, 2002).

Anonymity and Confidentiality

This has to do with making sure that the respondents are not being known or identified either by location or school type while writing up the report for dissemination. Therefore, explanations should be given to the gatekeepers on how the identities of the schools and teachers to be used will be anonymized. Details of how to ensure that the information gathered would be disclosed in such a way as to protect the identities of those who provided it should be discussed. For instance, distinctive features like numbers and letters should be used to hide the specific identities of schools and individuals who will provide the research information.

Dissemination of Results

Another challenge facing such research studies borders on how to develop strategies for dissemination of the research results so that they impact on policy making, implementation, and educational practice in the preschool institutions. In Nigeria, a number of well-conducted research reports are locked up in libraries and office cabinets where they tend to gather dust unnoticed. Thus, the entire efforts to conduct the proposed study might be an exercise in futility unless the research results are effectively disseminated to influence policy making, implementation and practice. To facilitate dissemination of the results of the study therefore, the investigator should:

(i)   present the research results during seminars, workshops, and conferences;

(ii)   submit executive summary of the major research findings directly to the ministries and parastatals as well as to individuals and organizations responsible for policy making and implementation at the pre-primary level of education in Nigeria.

(iii)   extract the major results of the research and submit them for

publications in learned journals. This will make it possible for a wider academic audience and practitioners (teacher trainers, caregivers, teachers of preschool children, policy makers, parents ,etc.) to have access to the research results;

(iv)   organize workshops on "Improving Classroom Interactions in Nigerian Preschools" for practicing teachers/caregivers in Nigeria; and

(v)   deposit the research data and accompanying copies of the research reports to school, public and special libraries in Nigeria.

Summary

Usually, the process of conducting research has its intellectual demands. However, this paper has focused on aspects of those demands that relate to methodological challenges in conducting evaluation research on classroom interaction patterns at the pre-primary level of education in Nigeria. The challenges discussed include those that border on the need to contextualize the theoretical basis of the proposed study; dearth of relevant library and bibliographic resources; restricted access to valid official educational statistics for designing and implementing the study; and the need to achieve a school sample that is representative of Nigerian states and cultural groups. The paper also highlighted the challenges associated with developing and using observation instruments, conducting research in multi-language setting, ethical issues and developing efficient strategies for dissemination of research results. It is hoped that the implementation of the suggestions on how to tackle these methodological challenges will enhance the quality of preschool-based studies on classroom interaction patterns in Nigeria..

References

Babbie, E.R. (1995). The practice of social research (7th ed.). Belmont, CA: Wadsworth.

Bruner, J. (1997). The culture of education. Cambridge Massachusettes: Havard University Press.Burmaan, E. (1999). Mortality and the goals of developme In M. Woodhead, D. Faulkner and K. Littleton (Eds.) Making sense of soci development (pp 170-180. London,: Routledge.

Hayes, D. (1999) Foundations of primary teaching. 2nd (ed). Trowbridge, Wilts: The Crimwell Press.

Jansen, J. (2004) 'Lost in transition' Researching education in Africa. A paper presented at Royal African Society Scotland Lecture/ Methodological Challenges of Researching Education and Skills in Africa at Moray House School of Education, University of Edinbrugh.

Karmiloff-Smith, A (1992) Beyond modularity: A developmental perspective on cognitive science. Cambridge Massachusetts: The MIT Press.

Katz, L.G. (1987). What should young children be learning. ERIC Digest.

Kearsley Greg, (2004) Explorations in learning and instruction: The theory into practice database. Downloaded from the Internet at http://tip.psychology.org/index.html

Kerlinger, F. N. and Lee, H. B. (2000) Foundations of behavioural research. Wadsworth:T. M. Academic Resource Center.

Li, M.F. and Lautenschlager, G. (9197) Generalizability theory applied to categorical data. Educational and Psychological Measurement, 57, 813-822.

Lybolt, J and Gottfred, C. (2004). Promoting pre-school language. The International Bureau of Education –IBE, Series 13.

Manstead A.S. R. and Semin, G.R. (1996) Methodology in Socio-psychological: Putting Ideas to Test. In M. Hewstone, W. Strobe, and J. M. Stephenson (Eds) Introduction to social psychology. U.K.: Blackwells Publishers Ltd.

Masson, J. (2002) Researching children's perspective: a psychological dimension. Buckingham: Open University press. Buckingham.

National Research Council Institute of Medicine (2000). From neurons to neighbourhoods: The science of early childhood development. Committee on Integrating the Science of Early Childhood Development. Jack P. Shonkkoff and Deborah A. Philips, Eds. Board on Children, Youth, and Families, Commission on Behavioural and Social Sciences and Education. Washington, D.C.: National Academy Press..

Okpala, N.P. (2002) Mid-term Evaluation of the Second Primary Education Project (PEP 2). Universal Basic Education Commission, Abuja, Nigeria, pp. 57.

Okpala, P. N.; Onocha, C. O. and Oyedeji, A.O. (1994) Measurement and Evaluation in Education. Ibadan: Stirling-Horden Publishers (Nig.) Ltd.

Okpala, P.N. and Onocha, C.O. (2001) Evaluation of teaching effectiveness. In J.O. Obemeata, S. O. Ayodele and M.A. Ayodele (eds). Evaluation in Africa (pp93-109). Ibadan: Stirlin-Horden Publishers, Nigeria, Ltd.

Onocha, C.O. and Okpala, P.N. (1990). Classroom Interaction Patterns of Practising Pre-Service Teachers of Integrated Science. Research in Education. 43, pp. 23 – 31.

Simpson, M. and Tuson, J. (2003) Using Observation in Small-scale Research: A Beginner's Guide SCRE (University of Glasgow) Publication

Vygotsky, L.S. (1962). Thought and Language. Cambridge, MA: MIT Press.

Vygotsky, L.S. (1978). Mind in Society. Cambridge, MA: Harvard University Press.