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Verbal Interaction as a Factor in Cognition: An Interaction Analysis of Instructional Radio in Kenya's Urban Primary Schools

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VERBAL INTERACTION AS A FACTOR IN COGNITION: AN INTERACTION ANALYSIS OF INSTRUCTIONAL RADIO IN KENYA'S URBAN PRIMARY SCHOOLS

by

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VITA

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His primary school education was received at Masikonde Primary School and ole Sankale Boarding School (Regional Education Board), in Narok, Kenya. His secondary education was obtained at Narok High School and graduated in 1974.

In May 1975, he entered Scott Theological College in Machakos, Kenya and graduated with a Diploma in Theology in March, 1979. In September 1980, He joined Columbia Bible College, Columbia, South Carolina to further his undergraduate education and was granted a B.A. in June 1981.

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In January 1985, he entered Loyola University of Chicago, Chicago, Illinois, to pursue his doctoral program. He was admitted into candidacy in June 1988. Mr. ole Takona resides in Glen Ellyn, Illinois with his wife Lily and their two sons, Lantei and Salaon.

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INTRODUCTION

A. OVERVIEW

Massive expansion of formal education at all levels in developing countries[1] has come, almost instantaneously, with the epoch of decolonization and independence within the last three decades. The provision of "universal primary education," (UPE), by these countries is perhaps the greatest demonstration of their development priorities and commitment to effect socio-economic change to short-circuit their reliance on the industrialized nations, including their former colonial masters.

In the midst of overwhelming quantitative expansion, educational programs in all the developing nations are faced by a multi-dimensional crisis brought about by:

(a) world-wide economic recession;

(b) growth of school enrollment;

(c) universal explosion of unemployment.

Although an elaborate discussion of the above phenomena

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[1]Are any of the world's poor countries located in Africa, Latin America, and Asia. Some of these nations fall into a sub-category commonly referred to as Third World. Such nations were once called underdeveloped, however, most economists now prefer the term developing countries.

is beyond the scope of the foregoing dissertation, a brief overview would throw light on the practical understanding of the socio-economic dimensions within which the educational planning in developing countries is engaged. Further, a presentation of the socio-economic perspective viewed against the background of the now classic dilemma of the need, on one hand, to provide a quantitative education, on the other hand, to maintain and improve its quality.

Worldwide Economic Recession

Government resources among developing nations, as in the industrial west, have suffered strain from the world wide economic recession and the nature of the present international economic order. These range from the fluctuation of oil costs to high interest rates. This has resulted in an enlargement of their foreign debt crisis.

To illustrate,

> Liberia struggles to find a resolution to its current debt crisis, the poor are caught in the middle. As evidence by the austerity measures . . . stability has mean cuts in social services and public employment. But the most durable effects is that it has diverted resources that could have been used for development.[2]

This "diversion of resources" in most cases goes into foreign debt. In 1987 for example, 43.3% of the export earnings from Zambia were allocated to servicing the country's

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[2]"Origin of Debt," West Africa, 12 May 1986, 991.

external debt;[3] Ivory coast spend 32.5% (1982)[4] and 32% (1986);[5] Egypt 35% in 1987;[6] while Mali, often considered the "poorhouse of the world," allocated 29.3% in 1985 to servicing their external debt.[7]

Observable from the statistics on Kenya (Table 1.1), are efforts to reduce external economic imbalances have met with considerable success. This was a prime goal set in various Development Plans. An examination of **The Development Plan for 1984-88**, clearly depicts the government's intention to reduce dependency on foreign inputs.[8]

Kenya, like the rest of the countries in the developing world, is economically underdeveloped with a very low ranking on the measure of world economic development. Although the economic situation in Kenya ranks high compared

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[3] Collin Legum, ed., "Zambia," Surveys and Documents: Africa Contemporary Records, 1986-1987, vol. xix (New York: Africa Publishing Company, 1988), B887.

[4]Collin Legum, ed., "Ivory Coast," Surveys and Documents: Africa Contemporary Records, 1982-1983, vol. xv (New York: Africa Publishing Company, 1984), B473.

[5]Collin Legum, ed., "Ivory Coast," Surveys and Documents: Africa Contemporary Records 1986-1987, vol. xix (New York: Africa Publishing Company, 1988), B398.

[6]Collin Legum, ed., "United Arab Republic of Egypt," Surveys and Documents: Africa Contemporary Records 1986-1987, vol. xix (New York: Africa Publishing Company, 1988), B529.

[7]Collin Legum, ed., "Mali," Surveys and Documents: Africa Contemporary Records 1986-1987, vol. xix (New York: Africa Publishing Company, 1988), B107.

[8]Government of Kenya, Development Plan for 1984-88 (Nairobi: Government Printers, 1984), 32.

TABLE 1.1

Disbursed Debt as Percentage of Gross Domestic Product (GDP)

	1976	1977	1978	1979	1980
Botswana	53.2	48.9	28.3	22.7	16.7
Tunisia	26.0	35.8	39.8	39.7	34.5
Egypt	36.0	41.9	45.1	75.5	63.0
Zaire	63.9	62.7	54.0	67.7	69.8
Malawi	41.0	42.4	46.9	38.9	41.2
Zambia	47.9	56.8	51.8	48.8	47.9
Kenya	20.2	20.4	20.4	23.5	24.6

SOURCES: United Nation: Statistical Information Bulletin for Africa (Washington: United Nations, 1976, 77, 78, 79).

to most African countries a large segment of Kenyans are still inhibited by poverty, "a condition of life characterized by malnutrition, illiteracy, disease and low life expectancy ..."[9]

Despite these economic strains, educational costs are continually stretching government budgets. Without being sarcastic, Uche who compares the educational system with an industry, rightly comments: ". . . education takes the lion share of the nation's resources."[10] This phenomenon has been

[9]Gerald E. Scott, "Debt and Development; The Modern Transfer Problem in Sub-Saharan Africa" (Ph.D. diss., University of Maryland, 1987), 30.

[10]P. I. Uche, "Some Statistical Enrollment Models for Developing Countries," Education and Development 1, no. 1 (1980): 72.

stressed by Carstens, et. al., when they write:

> Educational development of a country is but one sector of a developing state that need a large share of the limited resources that are available for development. Money spent on education is not available for the development of other sectors like welfare, agriculture, defence, etc...[11]

Growth of School Enrollment.

In its Universal Declaration of Human Rights Act of 1948, the United Nations stipulated that every one has the right to education and that education shall be free at least in the elementary and fundamental stages.[12] About three decades ago UNESCO organized three major conferences to help Latin American, Asian, and African countries determine their educational needs and goals for the years to come.

Policy-makers in the developing nations have since been under the pressure to provide at least some formal education for the entire school age population. Such pressure has not only come from international agencies as UNESCO but also from their own citizens. At the 1961 conference of African Ministers in Addis Ababa, Ethiopia, policy-makers, confident of the role education is supposed to play in development, were enthusiastic about the targets to be reached by 1980. These

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[11]P. D. Carstens, A. du Plessis, and M. Calitz, et al., The Implications of Forecast of Primary and Secondary School Enrollment in Owagwa, 1985-1989 (Bloemfontein: University of the Orange Free State, 1984), 1.

[12]United Nations, A Compilation of International Records of United Nations (Washington, D.C.: United Nations, 1967): 8, quoted in World Bank, Educational Policy Paper (Washington D.C.: World Bank, 1980), 6.

included universal free education and compulsory primary school; secondary education for 30% of all children finishing primary school; university places for 20% of secondary school completers.[13] Other targets indicated by some countries included,

> . . . to double the secondary school intake in the next five years; (to bring) the 3.5% of primary school enrollment rate to 6% by the end of the fifth year . . . . to provide universal primary education . . . .[14]

A close review of the National Educational Plans of the various countries represented at the conference, portray a bias toward rapid educational growth is evident. The introduction of the universal free education in primary schools by many of the developing nations is perhaps the greatest demonstration of their commitment to effect socio-economic change through education.

The 1976 introduction of Universal Primary Education (UPE), in Nigeria by the federal military government, drove the primary school enrollment figures from 4.97 million to 10.23 million by 1979, while secondary school enrollment rose from 507,270 to 1,650.300 in that some period.[15] As another example, between 1957 and 1977, primary school enrollment in

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[13]Conference of the Ministers of Education of African Member States, Education in Africa: Evolution, Reform, and Prospect (Paris: Unesco, December 1975), 15.

[14]Ibid., 18.

[15]"Nigeria: Fourth Plan (1981-1985), Africa Research Bulletin: Economic, Financial and Technical Series 18, no. 1 (28 February, 1981): 5821.

Nigeria soared over 300% increase from 2.5 million (1957), to almost 10.0 million in 1977.[16] Likewise, in Tanzania the number of pupils enrolled almost doubled between 1974 and 1977.[17] By the end of 1982 the numbers tripled.[18]

The provision of basic education to all citizens to enable them to contribute fully to social and economic development of the country is a basic requirement for enhancing the effort toward equality of economic opportunities and national unity. It was along this line that Kenya's ruling party, KANU, promised free education during the pre-independence campaigns prior to 1963.[19]

In 1974, the presidential edict on free education was realized, causing an upswing of primary school enrollment of 782,195 in 1961[20] to 3,233,000 in 1978,[21] an expansion exceeding 400%. During the period of 1961 and 1975, Kenya's government-aided secondary schools' enrollment rose from

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[16]Charles O. Akinde and Michael Omolewa, Mass literacy Campaign in Nigeria (Idanre, Nigeria: Center for Development Studies, 1983), 4.

[17]Ministry of National Education (Tanzania), Statistics of Education (Dar es Salaam:Government Printer, 1978), 34.

[18]Government of Tanzania, Ministry of National Education: Statistics of Education (Dar es Salaam: Government Printer, 1985), 26.

[19]J. Otiende, "Yesterday in Parliament," East Africa Standard, 11 July 1963, 3.

[20]Colony of Protectorate of Kenya, Statistical Abstract 1962 (Nairobi: Government Printer, 1962), 130.

[21]Republic of Kenya, Central Bureau of Statistics: Ministry of Planning and National Development, Statistical Abstract:1989 (Nairobi: Government Printer, 1990), 185.

18,400 to 106,300.[22] Between 1961 and 1984, the total number of Kenyans graduating from universities in East Africa grew from 99 to 2,750.[23] Further, it was estimated that by the end of 1983, over 9,000 Kenyans were studying overseas.[24]

This trend placed the Republic of Kenya, in 1977, among the few countries in Africa, Latin America, and Asia whose enrollment in primary school exceeded 90% of all eligible children. In addition, statistics released at the Geneva's 36th Session of the International Bureau of Education, Kenya was placed among the highest ten countries in the world in providing access to education for the majority of her people.[25]

Explosion in school enrollment undoubtedly comes with the most serious deficiencies in educational resources. This phenomenon has been discussed in an astounding large number of works in the literature.[26] Examples of such shortcomings

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[22]Government of Kenya, Ministry of Education, Kenya Syllabus for Primary Schools (Nairobi: Government Printer, 1983), 2.

[23]Republic of Kenya, Development Plan:1984-88 (Nairobi: Government Printer, 1983), 380.

[24]Ibid., 380.

[25]Republic of Kenya, Ministry of Education, "Kenya Education Team in Geneva," Newsletter 14, no. 14, (1977), 3.

[26]Tau Ngoc Chau, Population Growth and Cost of Education in Developing Countries (Paris: UNESCO/IIEP, 1972), 59ff; R. Jolly, Planning Education for African Development (Nairobi: East Africa Publishing House, 1967), 104-113; David T. Williams, "The Efficiency of Education," Education and Nation Building in the Third World, ed. J. Lowe (Edinburg: Scottish Academic Press, 1971), 66-78; H. M. Phillips, Basic Education: A World Challenge (London:John Willey and sons, 1975), 45; B. M. Raju, Education in Kenya (Nairobi: Heinneman Educational Books, 1973), 28ff.;

are mostly realized in shortages of classrooms, yielding to an increment in teacher-pupil ratio. Before the end of the first decade after Kenya obtained its own independence from Britain, the primary school teacher-pupil ratio had remained under 31. Following the 1974 declaration, classes of over 50 pupils were widespread. Today, the average teacher pupil ratio is 1:40.

In the 1960's and early 1970's, the Government of Kenya, generously, provided funds for essential textbooks, exercise books, and all school supplies. These were supplied freely to all primary schools. By the mid-1970's, with the oil crisis and the worsen economic situation, it became difficult to get increased government funds in proportion with the enrollment explosion. The shortage of textbooks and supplies does, unquestionably, limit learning tools and may affect achievement.

Similarly, the enrollment explosion that has affected a number of developing nations has come with a dreadful shortage of qualified teachers. As a result, it has lead to a recruitment of "temporaries" and "unqualified" teachers. As an example, a close examination of government statistics for untrained teachers kept by the Government of Kenya depicts a

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Republic of Kenya, Ministry of Finance and Planning, Statistical Digest (Nairobi: Government Printer, 1971), 14; Kenneth King, "Primary Schools in Kenya," Discussion Paper no. 130, 12 (n.d.), Developmental Studies, University of Nairobi, Nairobi; A. Somerset, "Who Goes to Secondary School? Efficiency, Equity, and Relevance in Secondary School Selection," Discussion Paper no. 184, 1ff.(n.d.), Institute of Developmental Studies, University of Nairobi, Nairobi.

ratio of trained/untrained teacher to exceed 2:1 between 1974 and 1977.[27] An investigation of this propensity has caused an erosion of the quality of instruction.[28]

Indepth discussions that illuminate these ensuing predicaments have been given by Ciona, Male, de Sotelo and Jamison.[29] Independent nations that were formerly European colonies have maintained the use of standardized tests results as criteria for promotion to the next level within the educational cycle. These studies cited above have claimed that the repeater rates is often escalated by a reduces quality of instruction.

Universal Explosion of Unemployment

Education has often been referred to as the placebo for social and economic ailments of any given society. This concept has been expanded by Psacharopoulos who notes that the

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[27]Republic of Kenya, Ministry of Education, Annual Reports (Nairobi: Government Printer, 1974, 1975, 1976, 1977).

[28]Esther Nyabonyi Michieka, "An Investigation of the Causes of Pupil Drop-out in Primary Schools in Kisii District of Kenya," (Post-Graduate Diploma Thesis, University of Nairobi, 1983), 35.

[29]Jane N. Ciano, "An Investigation of Causes and Effects of Secondary School Drop-outs in Nairobi" (Post-Graduate Diploma Thesis, university of Nairobi, 1982), 40; Lamine Male, "A Study of the Causes and Effects of Pupils Drop-out of the Primary School Level in Mali" (Post-Graduate Diploma Thesis, University of Nairobi, n.d.), 23; Sylvia Schmelkes de Sotelo, "The Radio Schools of the Tarahurama, Mexico: An Evaluation," Radio for Education and Development: A Case Study, 1, no. 266, ed. Peter L. Spain, et. al., (Washington, D.C.: The World Bank, n.d.), 41; Dean T. Jamison and Joane Leslie, "Planning Radio's Use for Formal Education: Methodology and Application to Indonesia," Radio for Education and Development: A Case Study, 1 no.266, ed. Peter L. Spain, et. al., (Washington, D.C.: The World Bank, n.d.), 141.

returns on investment in education appear in most cases to be above the returns from alternative investment opportunities. In this regard, priority should be given to investment in man versus investment in machines.[30]

The universal explosion of unemployment may be envisioned in two dimensions. The first dimension is that which is related to the sociological aspect. Employment by its very inherent nature in affects the relationship between the individual and society. and to a significant degree, has torn down the national, classes, professional, ideological and religious supports which provide the social framework for the individual.

The ability of individuals to find a constructive role in society has become more dependent, than in the past. On the self consciousness and understanding which education provides, on better knowledge and understanding of the choices favored by society, and in certain respect on a "critical" view of society To state it in other terms, today in the developing nation (as it is in the industrialized West) the socializing role of education is dependent on individualization.

The second dimension is related economical aspect. If validity is in the human capital theory contending that poverty is often derived from low productivity then the quality of education depicts major implications. There is no

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[30]George Psacharaopoulos, "Rates of Return to Investment in Education Around the World," Cooperative Education Review, 16, no. 1, (February 1972): 54ff.

doubt that educational objectives are economically influenced. Developing nations invest large proportions of their government budgetary expenditures on education with the belief that education serves the purpose of predisposing and preparing its citizenry for the world of work.

An increasingly serious phenomenon in recent years in most developing nations, is the numerical count of its "literate" population admitted in the ranks of the unemployed. This scenario does not occur due to lack of education but rather due lack of the necessary skills required by industry. This is aptly characterized by the following quotation from the 1966 Economic Survey of Kenya:

> The rapid growth of Kenya's population continues to generate more unskilled and untrained manpower in the country than there are job opportunities for them, while at the same time, a significant number of vacancies exist for personnel with specialized training or skills.[31]

This assertion has been restated in similar terms in a governmental document, The Development Plan 1974-78:

> One dimension of this situation is the appearance, in ever increasing numbers, of individuals whom the formal educational system has not equipped with skills and qualities required by the economy.[32]

The Select Committee on employment added that:

> In Kenya's context, however, the school curriculum are such that they do not provide the school-leavers with immediate applicable skills after leaving

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[31]Republic of Kenya, Economic Survey of Kenya (Nairobi: Government Printer, 1974), 3

[32]Republic of Kenya, Development Plan: 1974-78, Part I, (Nairobi: Government Printer, 1974), 404-405.

school.[33]

A situation such as this arises when an educational system places emphasis on curricula that do not relate to the practical needs of the economy. The problem therefore, is no longer the provision of basic education; it is, rather, the type of education being provided.

An eloquent expression of this utilitarian theory has been illustrated by the Tanzania's introduction of the "education for self-reliance" policy into its educational system. This policy consequently envisages a primary school education that integrates school activities with productive work in the surrounding community. The Musoma resolution states:

> . . . the basic aim of our education is the development of socialist attitudes. A social is a worker. Therefore, by introducing work in schools, we are building socialist habits in the students, the socialist habits of wanting to work.[34]

Global economy has undergone a metamorphic change. This change moved from dependance on subsistence agriculture to industrial manufacturing; to service industry then to the present stage of information industry. Such change does affect the nature of the educational institutions which, too, must experience dramatic shifts. These dramatic shifts are

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[33]Republic of Kenya, Report of the Select Committee on Unemployment: National Assembly (Nairobi: Government Printer, 1970), 3

[34]Julius K. Nyerere, Musoma Resolution: Directives on Implementation of Education for Self-Reliance (Dar es Salaam: Government Printer, 1981), 42.

felt more in the developing nations. Alterations of this kind bring about major curricula changes that affect the structure of the educational model and its content. In addition, new methods of teaching are probably appropriately developed.

In the content area, the unfamiliarity of what is in many of the school textbooks, vexs not only parents but also teachers. As an example, a number of African countries that emerged from colonialism in the early 1960's adapted what has come to be referred to as "New Mathematics," with the metric system as its backbone.

Although this switch remained very controversial for a number of years, it nevertheless went beyond the mere change of curricula content to the total infrastructures of the nations. Society had to be re-skilled --traffic control signs had to be changed; meter readers had to acquire metric system conversion skills; etc.

Additionally, the present day socio-economic and cultural relativity seeks to challenge various unquestioned assumptions and points of view. English language teaching has been revamped in the direction of greater emphasis upon mastery of the spoken language and now occupies a somewhat more prominent place in the curriculum.

These social and educational changes are expensive both in time, skill, and budget. Kenya for example, has reconstructed not only its school curriculum but also the educational structure with the introduction of the 8-4-4 system.

This system is an educational cycle implemented in 1984 by the Kenya parliament to afford eight years of primary school; four of secondary school; and four of college or university. The government of the Republic of Kenya adopted this system with the intent that the Kenya educational:

> Structure . . . should lead to the development of communication skills (literacy) through the teaching of mother tongue, English and Kiswahili languages. The development of numerics will be done through the teaching of mathematics, while the development of scientific outlook will be done through the teaching integrated science. The development and acquisition of social and cultural knowledge, skills and attitudes will be done through teaching of social studies, religious education, musicians physical education. Art craft and home science will provide for practical knowledge and skills.[35]

No evidence has been found in the literature indicating a desire by a nation to turn primary schools into vocational institutions. There are, however, numerous examples in which certain nations have advocated that the school curriculum be made flexible enough to take care of the demands of society. Some of these demands are related to vocational and technical skills which will contribute to the socio-economic development.

An extreme to advocacy is clearly illustrated by the Tanzania's model of "Education for Self-Reliance". An extensive review of the literature on the Tanzania's model, Bueme writes:

> In Educational for Self-Reliance, Nyerere identified four characteristics of (the Pre-existing

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[35]Republic of Kenya, Ministry of Higher Education (Nairobi: Government Printer, 1984), 4.

> educational system) which ran counter to socialist objectives. It was elitist, preparing only a small percentage of the population with "purely academic" education: it separated students physically and intellectually from the rest of society; it assumed that only formal, academic learning was to be esteemed; and it constituted a significant drain on the country's financial and human resources, while contributing nothing . . . The fundamental remedy proposed was the reconstruction of the school from an isolated institution serving only a few academically talented individuals to a self-reliant community center focused on majority needs.[36]

In summary, this overview has highlighted various global socio-economic dimensions that serve a background for curriculum development and innovation in the developing nations.

B. THE PROBLEM

As it has been indicated in the preceding pages of this study, education is a sector of the economy that requires a high proportion of public expenditure. And, as nearly all projections imply, a high proportion of qualified manpower. It is in this context that this study attempts to determine the effectiveness of instructional radio as a method of instruction adapted by the government of the Republic of Kenya to meet the educational needs of its growing primary school population.

The effectiveness of an educational system, like any other kind of service, depends on the results obtained per

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[36]C. Buema, Self-Reliance Activities in Tanzanian Schools: A Review of Literature (Stanford, CA.: Stanford University, n.d.), 2.

unit spent. What unit should be chosen in the case of this particular service to measure its results? The reply to this question is tantamount to trying to define exactly the characteristics of the final output of the educational process.

It is generally acceptable to state that the main aim of any educational service is to provide knowledge to a group of people. In this case to improve the effectiveness of a service is to increase the output capacity of the unit invested.

In a discussion that was provided in an earlier page, change within certain components in society has been immense. To that effect, it is not self-evidently true that the process of education is stagnant. The educational system can rarely have been in such rapid change as it is at the moment. Examples of these changes includes the relationships of teachers and pupils; the role of educators and policy-makers; and the adaptation and introduction of new methods of instruction.

As for the case of Kenya, accelerating inflation, multiplication in birth rate (4.3% p.a), soaring enrollment following the 1974 presidential edict on free education, educational resource as instructional materials and qualified teachers have became scarce (especially in specialized subjects as mathematics and language instruction), certaily predict trouble.

The Ministry of Education, and subsequently, the policy-

makers in the Kenyan Parliament are convinced with both the soundness and efficiency of instructional radio. Reports and studies provided by the Washington D.C. based Academy for Educational Development: Agency for International Development (AID), have influenced the Kenya's Ministry of Education to accede to instructional radio as a strategy

> . . . bringing into rural classrooms instructional techniques that might not otherwise be available in providing a systematic coverage of curriculum, a strong model of correct English, sophisticated pedagogy, maximum exposure to the target language, and lessons that can capture children's attention and motivation.[37]

The objectives of primary school education have been delineated by the Ministry of Education, Science and Technology for the purpose of providing learning opportunities which will enable pupils to:

1. Acquire literacy, numeric and manipulative skills;
2. Develop self-expression, self-discipline, self-reliance and full utilization of a child's senses;
3. Develop ability to clear logical thought and critical judgment;
4. Experience a meaningful course of study which will lead to enjoyment and successful learning and a desire to continue learning;
5. Acquire a suitable basic foundation for the world of work in the context of economic and manpower needs of the nation;
6. Appreciate and respect the dignity of labor;

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[37]Philip Christensen, The Radio Language Arts Project: Teaching by Radio in Rural Kenyan Primary Schools, Unpublished paper presented at the Northwestern University Conference on Communication, Mass Media and Development, Evanston, Illinois, 13-15 October 1983, 19

7. Develop desireable social standards and attitudes;

8. Grow into a strong and healthy person;

9. Develop a constructive and adaptive attitude to life based on moral and religious values and responsibilities to the community and the nation;

10. Appreciate one's own as well as other people's cultural heritage, develop aesthetic value and make good use of leisure time;

11. Grow towards maturity and self fulfillment as useful and well adjusted members of society.[38]

The questions that now exist, and indeed susceptible to reasonable answers, are in the following areas:

a. What are the best means of achieving educational objectives utilizing this strategy?

b. What is the degree of effectiveness of instructional radio lessons in meeting the intended curriculum objectives?

c. To what extent is instructional radio satisfying the educational objectives as delineated in the Kenya Primary Education Syllabus?

C. THE PURPOSE OF THE STUDY

This study attempts an inquiry into the effectiveness of instructional radio as a teaching method adopted by the Ministry of Education in the Republic of Kenya. It seeks to examine the assumption that "serious improvement is possible

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[38]Government of Kenya, Ministry of Education, Science and Technology, 8-4-4 System of Education (Nairobi:Government Printers, December 1984), 3f.

in the teaching of a second language in primary school . . . through radio-delivered teaching instead of through conventional classroom instruction.[39]

This quotation has been extracted from the literature prepared by the Academy for Educational Development, a department of the U.S. Agency for International Development (AID), which has convinced developing nations, including Nicaragua, Kenya, and Thailand that the "prospect for improvement using conventional educational means are grim--in fact, educational quality may decline further.[40]

In addition:

> Interactive radio, we believe, now stands ready to serve as a powerful tool for educational development. Radio instruction can now be used with assurance to improve teaching quality, to increase educational access, and to introduce new subject matter.[41]

The specific objectives of this study are:

1. To conduct an inquiry into the cognitive outcomes of the English course curriculum;

2. To ascertain the amount of interaction occurring in English lesson classrooms;

3. To determine whether the degree of interaction in English lesson classrooms has a bearing on cognitive outcomes;

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[39]M. Imhoof and P. Christensen, eds., "Forward," Teaching English by Radio: Interactive Radio in Kenya (Washington, D.C.: Academy for Educational Development, 1986), vii.

[40]Ibid., viii.

[41]Ibid., ix.

4. To draw conclusions from the findings and suggest some policy recommendations.

D. THE SCOPE AND LIMITATIONS OF THE STUDY

This study is limited to an analysis of the non-traditional instructional medium adapted by the ministry of Education in the Republic of Kenya. The study is focused on interaction as a factor affecting cognitive outcomes in formal education. It is confined to urban-based primary schools and strictly limited to standard three (STD 3), classrooms in the category A type primary schools of the Nairobi City Council school system.

Category A schools are in the majority in the Republic of Kenya. Although instructional radio lessons are aimed at all schools, there are few and sparse category B and C schools utilizing them. This is because the category B and C schools are predominantly private elitist institutions.

This study is limited to Nairobi where there are specific advantages exist. These include:

1. Age /grade uniformity as opposed to rural schools where pupils' ages vary considerably within grade;

2. Cultural heterogenity. Pupils in urban environment are more diversified culturally and more socially prepared than their rural counterparts. To the rural pupil, electronics, including the radio, is foreign;

3. Consistency in school attendance. Urban pupils attend school a more regularly than do their rural counterparts;

4. Language factors. Urban youngster are more likely to exhibit uniformity in the mastery and usage of the Kiswahili language in addition to their mother-tongue.

E. SIGNIFICANCE OF THE STUDY

Quality versus quantity in education is becoming a major issue in developing nations in the last two decades. This has inspired the revision of educational policies to meet the increased demand for education.

It could be documented, precisely, that developing nations envisage that efforts should be directed, in the foremost, to the expansion of education, particularly at the primary school level, to cater to the majority of the population. In an effort to curb inequality in educational distribution, many developing nations have achieved considerable success in providing education for more children with the damaging effects in many cases on its quality. Little, however, has been done in seeking to determine if the basic educational concerns of skills in observing, analyzing, communicating, capacity to learn and re-learn throughout one's life are achieved via the various instructional modes that are now being utilized.

This study is significant because of the following reasons: First, an investigation into the literature suggest that those educational technologies designed to increase the effectiveness of the teaching-learning components have not received much attention in empirical and experimental

research. While this dissertation appreciates the growing recognition that traditional methods no longer suffice in relation to the magnitude of educational expansion, it does, however, seek to expand the literature favoring the enhancement of the teaching methods.

Second, this study will provide a basis for the evaluation of instructional radio programs in measures relating to decision-making and planning processes for in-service teachers' and refresher programs, curriculum planners and radio program developers, and even for African teacher training colleges.

Finally, and most importantly, the findings, conclusions, and recommendations of this study may be used by policy makers (who for the most part are only educational laymen), to go beyond the mere consideration of adopting less costly means of providing education to their citizens. In so doing, they will begin to consider alternative means that are sufficient enough in achieving the nationally established aims of education without compromising curricula content.

CHAPTER II

REVIEW OF RELATED MATERIAL AND DISCUSSION ON KENYA

A. INTRODUCTION

Readings on classroom learning have identified a spectrum of factors associated with cognitive outcomes but no coherent theory linking them with the social context has yet been developed. A closer review of studies seeking to understand differences in school progress have, undoubtedly, been observational or quasi-experimental inquiries amalgamating psychological and sociological studies of the classroom environment. The results obtained, although confirming each other in some instances, have generally been inconclusive, conflicting, or non-replicable. Bennett and his colleagues have claimed that teaching styles have a bearing on student achievement;[1] Stallings asserted that the length of school day and amount of direct teacher instruction are determinants of cognitive achievement;[2] and Bossert maintains that pupils' achievement is influenced, positively or negatively, by the task organization of a classroom through

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[1]Neville Bennet, Teaching Styles and Pupil Progress (Cambridge, Mass.: Harvard University Press, 1976), 22.

[2]J. A. Stalling, "How Instruction Processes related to Child Outcomes in a National Study of Follow-through," Journal of Teaching Education, 27 (1976): 43-47.

the tasks activity's effect on teacher assistance pattern.[3]

Carroll hypothesized that time could affect student achievement.[4] He developed a model of school learning suggesting that the degree of learning attained by an individual is a function of the time spent learning the task divided by the time needed to learn the task.

Linton, in his comparative study, found that students' socio-cultural characteristics affect school achievement.[5] Contrary to some of the studies above, Jencks found that the environment and teacher differences exert minimal effect on pupils' learning.[6]

Basil Bernstein has identified three "message system" in modern education experience that are inextricably intertwined. He writes:

> . . . curriculum defines what counts as valid knowledge, pedagogy defines what counts as valid transmission of knowledge, and evaluation technique defines what counts as the valid realization of knowledge on the part of the taught.[7]

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[3]Steven T. Bossert, Task and Social Relationships in Classrooms (London: Cambridge University Press, 1979), 95.

[4]J. B. Carroll, "Model of School learning," Teachers'College Record 64 (1963): 732.

[5]Harvey T. Linton, "Socio-Cultural Characteristics, Alienation from School and Achievement among Mexican American and Anglo-sixth Grade Students" (Ph.D. diss., New Mexico University, 1970), 89.

[6]Christopher Jencks, Inequality: A Reassessment of Family and Society in America (London: Allen Lane, 1973), 43.

[7]Basil Bernstein, Class Code, and Control: Theoretical Studies Toward a Sociology of Language, 1 (London: Routledge and Kegan Paul, 1971), 203.

Bernstein, however, stops without mentioning either the role of the teacher as one whose activities through communicative practices within the actual classroom setting produce the working out of these message system or the "perfect" environment within which the learner manipulates the actual cognitive structures in an instructional experience.

The central aim of this review is to examine literature on the implicit theory of learning that, often, underlies certain communicative choice and the transmission of knowledge. For the purpose of avoiding the possibility of presenting a cumbersome and less functional review of literature for this dissertation, the researcher has determined two dimensions to the study of classroom interaction. The first one will contribute a descriptive examination of the teaching learning environment. The second will examine teaching-learning style -- more specifically, the process-product dimension.

B. THE TEACHING-LEARNING ENVIRONMENT

Within the educational discipline, two major approaches to the study of teaching-learning process are widely used. The first approach lends itself to the description of the teaching-learning environment with the primary aim of reporting recurring sequences and identifying predictable patterns of behavior. The second approach attempts to examine specific observable activities (as teacher management and

consequent stimuli, feedback, pupils response, and others), in the teaching-learning environment and ultimately linking them to learner achievement (cognitive and affective).

Classroom dynamics, usually conceived as the interaction between teacher and pupil, and pupil and pupil, and their effects to cognitive achievement continue to be a source of much interest to education researchers and practitioners. The varied perspectives introduced into their particular field of inquiry is clearly illustrated by the various observational processes and schemes that have been used, and indeed, "canonized" to describe and assess classroom ecology. Simon and Boyer[8] have provided an extensive compilation of observational systems that have been used in a variety of interactive settings.

As examples, Dodl has develop a scheme that examines pupils' questioning behaviors;[9] Jecker, Maccomby and Breitros[10] in their attempt to examine pupils' understanding of instructional material as reflected by non-verbal cues have developed a classification model; Aschner have provided a classification of classroom dialogue and the cognition of

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[8]A. Simon and E. G. Boyer, eds., Mirrors for Behavior Ill: An Anthology of Observation Instruments (Wyncote, Pennsylvania: Communication Materials Center, 1974).

[9]Norman R. Dodl, Pupil Questioning Behavior in the Context of Classroom Interaction (Palo Alto, California: Stanford University, 1965), 12.

[10]Jon D. Jecker, Nathan Maccomby and H. S. Breitros, "Improving Accuracy in Interpreting Non-verbal Cues of Comprehension," Psychology in the Schools, 2 (February 1965), 241.

teachers and pupils.[11] Flanders,[12] Bale,[13] and Aschner[14] have individually provided closely related schemes useful in the examination of the socio-emotional climate.

While pertinent differences exist in, sofar as, the extent of the methodology employment to emphasis, focus, and procedural application, all instruments that are engaged aim at describing and monitoring interaction in a learning environment. Further, research relevant to the understanding of the teaching-learning processes has concentrated on the collection and analysis of various human behaviors in natural setting and in exploring what is learned from, and how people learn through interacting with each other.

Data from two studies dealing with the question of leadership and peer ratings could be pooled to cast some light upon the group interaction model and possible learning outcomes. First, a recent study reported by Dabbs, Ruback and

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[11]Mary J. Aschner and others, A System for Classifying Thought Processes in the Context of Classroom Verbal Interaction (Urbana-Champaign, Illinois: Institute for Research on Exceptional Children, University of Illinois, 1965), 7.

[12]Ned A. Flanders, Interaction Analysis in the Classroom: A Manual for Observers (Ann Arbor, Michigan: School of Education, University of Michigan, 1966).

[13]Robert F. Bale, "Set of Categories for the Analysis of Small Groups," American Sociological Review, 15 (1950): 257ff.

[14]Mary J. Aschner, "The Analysis of Verbal Interaction," in Theory and Research in Teaching, ed. Arno A. Bellack (New York: Teachers College Press, Columbia University. 1963).

Evans[15] replicated an earlier study by Lafferty and Ponds[16] on desert survival problems.

Dabbs and his associates selected a sample that involved 20 mixed-sex groups that worked on desert survival problems for 10-20 minutes each. Each of the subjects played a role of being stranded in the wilderness following an air crash. Each of the subjects ranked 15 items, in terms of their importance, for survival. They then discussed the problem to reach consensus on the ranking of each item.

Using a microcomputer, Dabbs and his associates recorded the subjects vocal data collected in addition to various other data from questionnaires completed at the end of the discussion. The vocal questionnaire data was analyzed at both individual and group levels. At the individual level, Dabbs and his colleague reported that talking related to ratings of leadership and less strongly, to rating on liking. When the amount of talking was controlled for, leadership was found to be related positively to vocalizing in one's own turn and negatively to emitting simultaneous speech in others turns.[17]

The second study was contacted by Ruback, Dabbs and

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[15]J. M. Dabbs, R. B. Ruback and M. S. Evans, "Group-Talk: Patterns of Sound and Silence in Group Conversation," in Non-verbal Behavior and Communication, ed. Siegman and Feldstein (Hillside, New Jersey: Earlbaum, 1987), 509-520.

[16]J. C. Lafferty and A. Pond, The Desert Survival Situation (Plymouth, Michigan: Human Synegistic, 1974).

[17]Ibid., 565.

Hopper[18] analyzed the process of brainstorming with individuals and with a group. A sample of 20 mixed-sex groups that worked for 20 minutes each brainstorming on how to increase the number of tourists visiting the United States. Included in the data collection instruments was a questionnaire completed at the end of the session. The procedures executed by Ruback and his colleagues, included the use of two judges each utilizing a video monitor to detect and record originators of new ideas and the time of their occurrence.

The experiment reported that high levels of talking were related to peer rating of leadership and less strongly to liking. When the amount of talking was controlled for, ratings on leadership were still positively related to the amount of time vocalization occured in one's own turn.

While the goals of the studies by Dabbs and his associates and by Rabuck and his associates are different, they present an understanding of the nature of the teaching-learning process while identifying a factor supporting learning, namely, leadership. Whereas some learning may occur in almost any kind of environment, a setting promoting leadership is, definitely, more conducive.

Teaching and learning has often been viewed as a linguistic process. Any process, be it mechanical or

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[18]R. B. Ruback, J. M. Dabbs, and C. H. Hopper, "The Process of Brainstorming: An Analysis with Individual and Group Vocal Parameters." Journal of Personality and Social Psychology 47 (1984): 558-567.

otherwise, has more than one element involved. In a teaching-learning process the elements that are involved include the teachers, pupils, and classroom events. A typical feature to this conceptualization is the view that classrooms are communicative environments in which the action of interaction are made up of everyday life.[19] This is a perspective addressing Arnulfo Ramirez[20] concern for a need to identify differences in patterns of classroom language, their use and rules.

Within the discussions on pupils and achievement, is data on class size. Research on this area is immense and, generally, believed to be inconclusive and somewhat contradictory. A prime example is a review done by Porwell which provides both limited and selective data drawing the following conclusion:

> Research finding on class size to this point document repeatedly that the relationship between pupil achievement and class size is highly complex . . . . Existing research findings do not support the contention that smaller classes will of themselves result in greater academic achievement gain for

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[19]F. Erickson and J. Schultz, "When is a Context? Some issues and Methods in the Analysis of Social Competence," in Ethnography and Language in Education Settings, ed. Judith L. Green and C. Wallat (Norwood, New Jersey: Ablex Publishing Corporation, 1981), 148.

[20]Arnulfo Ramirez, "Analyzing Speech Acts." in Multiple Perspective Analysis of Classroom Discourse, 28 ed. Judith L. Green and Judith O. Harker (Norwood, New Jersey: Ablex Publishing Corporation, 1988), 159-160.

pupils.[21]

In their meta-analysis study of approximately 80 studies on class size and achievement relationship, Glass and Smith have found a correlation. When the size of the class is significantly reduced the achievement level increases. This reduction alters the teaching methods.[22]

In his discussion on whether class size makes a difference in pupils' achievement gains, Bereiter[23] examines the work of Ryan and Greenfield[24] which suggests that teachers in smaller classes do not necessarily give more time to individual work of students. Bereiter notes that if teachers in small classes give the same amount of time as teachers in larger classes, then obviously the result should be more individual attention per student.[25]

He does not, however, hesitate to speculate why teachers

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[21]P. J. Porwell, Class-Size: A Summary of Research (Arlington, V.A.: Education Research Service, Inc., 1978), 68-69.

[22]Gene V. Glass and Mary Lee Smith, Meta-Analysis of Research on the Relationship of Class Size an Achievement (Boulder, Colorado: University of Colorado Laboratory o Educational Research, 1978), 43.

[23]Carl Bereiter, "Can Class Size Make a Difference," in Clarifying the Class Size Question, eds. Ryan and Greenfield (Toronto, Ontario: Ontario Institute for Studies in Education, 1976). 145ff.

[24]Doris W. Ryan and Greenfield, ed., Clarifying the Class Size Question (Toronto, Ontario: Ontario Institute for Studies in Education, 1976).

[25]Carl Bereiter, "Can Class Size Make a Difference," in Clarifying the Class Size Question, eds. Ryan and Greenfield (Toronto, Ontario: Ontario Institute of Education, 1978), 146.

in smaller classes do not devote more time to individual work with pupils when he states:

> My hunch is that most individual work is remedial, focused on students who "fall behind" the rest of the class. In a smaller class, everything else being equal, fewer students will fall behind. Moreover, with a smaller class it should be easier to gear the instruction to a level such that a smaller proportion of students will find themselves lagging.[26]

Even after a careful and intensive study of the numerous data reports, Glass and Smith would only provide this conclusion:

> Research on class-size and achievement is a particularly complex body of findings to integrate and understand. The integration of this literature has required more sophisticated analysis than has previously been applied to the problem. The meta-analysis of the research reported here has drawn heavily on precise quantitative description and analysis. A clear and strong relationship between class-size an achievement has emerged. The relationship seems slightly stronger at the secondary grades than the elementary grades; but it does not differ appreciably across different school subjects, levels of pupil IQ, or several other obvious demographic features of classrooms. The relationship is seen most clearly in well-controlled studies in which pupils were randomly assigned to classes of different sizes. Taking all findings of this met-analysis into account, it is safe to say that between class-size of 40 pupils and one pupil lie more than 30 percentile ranks of achievement. The difference in achievement resulting from instruction in groups of 20 pupils and groups of 10 can be larger than 10 percentile ranks in the central regions of the distribution. There is little doubt that, other things equal, more is learned in smaller classes.[27]

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[26] Ibid., 146.

[27] Gene V. Glass and Mary Lee Smith, Meta-Analysis of Research on the Relationship of Class Size and Achievement (Boulder, Colorado: university of Colorado Laboratory of Educational Research, 1978), 45-46.

C. THE TEACHING-LEARNING STYLE

The second approach to the study of the teaching-learning process stated earlier on in this review is that which attempts to examine specific observable activities in the classroom. While the order under which the categories of observable activities is reviewed here is not intended to be hierarchical in importance, effectiveness, or otherwise, readings on teaching and learning processes dichotomize instruction into direct content insemination (presentation of content area /skills), and ancillary procedure (praise, questioning, feedback and management).

Direct Content Insemination Procedures

1. Learning task

Literature on the discussion on what the most effective approaches to instruction are and about how instructional content should be discussed, presented, and evaluated is enormous. Curriculum planners and teachers need many ways to encourage learning. While most of these approaches are different depending on the learning theory approaches they emphasis, there are, however, certain features on effective instruction that are common to most of them. Concepts from each of these learning theories and instructional models are in use in curriculum planning and teaching today.

Barak Rosenshine on discussing teaching functions in instructional programs reviews a total of seven studies from which he develops a teaching function model (Figure: 2.1), "as

FIGURE: 2.1

INSTRUCTIONAL FUNCTIONS

I. Daily review,checking previous day's work, and reteaching (if necessary):
   -Checking homework
   -Reteaching areas where there were student errors
2. Presenting new content/skills:
   provide overview
   -Proceed in small steps (If necessary, but at a rapid pace if necessary, give detailed or redundant instructions and explanations
   -New skills are phased in while old skills are being mastered
3. Initial student practice:
   -High frequency of questions and over student practice (from teacher and materials)
   -Prompts are provided during initial learning (when appropriate)
   -All students have a chance to respond and receive feedback
   -Teacher checks for understanding by evaluating student responses
   -Continue practice until students are firm
   -Success rate of 80% or higher during initial learning
4. Feedback and correctives (and recycling of instructions (if necessary):
   -Feedback to students, particularly when they are correct but hesitant
   -Student errors provide feedback to the teacher that corrections and or reteaching is necessary
   -Corrections by simplifying question, giving, clues, explaining or reviewing steps, or reteaching last steps
   -When necessary, reteach using smaller steps
5. Independent practice so that students are firm automatic:
   -Seatwork
   -Unitization and automaticity (practice to over
   -learning)
   -Need for procedure to ensure student engagement during seatwork (i.e. teacher or aide monitoring) 95% correct or higher
6. Weekly and monthly reviews:
   -Reteaching, if necessary

Source: Barak Rosenshine, "Teaching Functions in Instruction Programs," Elementary School Journal, 83, no. 4 (March 1983): 337.

a guide for discussing the general nature of effective

instruction."[28] While Rosenshine considers the six components of his model as being adequate, he however admits the amenability of the model to elaboration and deletion.[29] Learning tasks, for example, ought to be capable of informing students what they are expected to learn and how they are supposed to demonstrate the extend to which those learning tasks have been accomplished.[30]

In addition, the selection and assignment of learning tasks is the responsibility of the teacher and not a choice of the student. The teacher teaches and reteach as required to assure comprehension. Pupils reciprocate with practice and re-learning through which the teacher receives a feedback. The feedback received would dictate the measures needed in recycling instruction for the purpose of achieving a high rate of success, thus yielding a higher level of achievement.

Research by Rosenshine and his associate has reported a negative correlation between task of low success rate and achievement.[31] Conversely, a positive correlation has been reported between high rate of learning tasks success and

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[28]Barak Rosenshine, Teaching Functions in Instruction Programs," Elementary School Journal, 83, no. 4 (March 1983): 338.

[29]Ibid., 338.

[30]B. V. Rosenshine and D. Berliner, "Academic Engaged Time," British Journal of Teacher Education, 4 (1979): 134.

[31]Ibid., 134.

higher achievement.[32]

The instructional function model (Figure 2:1), accurately conveys the fact that in a true teaching-learning transaction two constituents are engaged, namely the teacher and the learner(s). Between the teacher and the learner is content (learning tasks). The teacher transmits the learning tasks to the learner who, in turn, receives and masters them. Thus, occurring within this teaching-learning environment is an interaction from which the teacher, continuously, gauges the learners level of understanding and mastery.

This model provides a useful framework for understanding Vygotsky's activity theory because it promotes the possible differential relationship between feedback and the comprehension that occurs during the acquisition and the implementation phases of learning. The Vygotsky theory presents much implications for a mutual regulatory feedback between knowledge acquisition and implementation (as demonstrated through activities).[33]

If it is assumed that knowledge acquisition during classroom verbal instructions involves fewer learners activities (phase 2), and less corrective feedback during knowledge implementation (phase 3), it should be expected that

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[32]D. C. Berliner, Teacher Behavior: Research Trends, Research Needs, A Paper presented at the annual meeting of the American Educational Research Association, Boston, Spring 1980, 2.

[33]L. S. Vygotsky, Mind and Society (Cambridge, Mass.: Harvard University Press, 1978), 80-81.

feedback (in the form of questions), during acquisition will be less effective in promoting comprehension than feedback (questions), during implementation. During acquisition, it is possible that fewer kinds of knowledge will be clarified. But during implementation, relatively many will be affected. Brown and Campione acknowledge this when they affirm:

> Understanding is more likely to occur when a student is required to explain, elaborate, or defend his or her position to others; the burden of explanation is often the push needed to make him or her evaluate, integrate, and elaborate knowledge in new ways.[34]

Further, the importance of learner's questioning pattern has been emphasized by researchers interested in meta-cognition: "Question-asking represent one of the primary means by which individuals are able to foster their own comprehension and, as such, represents a powerful meta-cognitive activity."[35]

Rosenshine's model has a lot of similarities with the "cognition apprenticeship" model that has recently been presented by Collins, Brown, and Newman.[36] They model involves initial instruction (phase 2 in the instructional

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[34]A. Brown and J. Campione, "Psychology Theory and the Study of Learning Disabilities," American Psychologist 14 (1986): 1066

[35]J. R. Gavelek and T.E. Raphael, "Meta-cognition, Instruction and the Role of Questioning Activities," in Meta-cognition, Cognition, and Human Performance, eds. D. L. Forrest-Pressley, G. E. Mackinnon, and T. G. Waller (Orlando, Florida: Academic Press, 1985), 114.

[36]A. Collins, J. S. Brown, and S. Newman, "Cognitive Apprenticeship: Teaching the Craft of Reading, Writing, and Mathematics," in Knowing, Learning, and Instruction: Essays in Honor of Robert Glaser (Hillside, N.J.: Erlbaum, 1989), 453-495.

function), coaching (phase 3 & 4), scaffolding (prompt as in phase 3), and fading (phase 5). In Rosenshine's instructional function model, as in the cognitive apprenticeship, students gradually take on more responsibility as the cognitive support diminishes.

Roseshine's model and discussion is valid in at least two areas. His instructional function model indicates an interaction or need for one in the various components. While it does not answer the questions: Is this model correctly put together? Is it hierarchial? It does answer the question: To what extent are the various components interdependent?

It does not, however, adopt the rates of time spent as a function of cognitive outcomes (as attest by Carrol theory[37] on achievement and time on task). Secondly, it does not specify parameters for different types of learning by learners of varying characteristics under instruction conditions.

Rosenshine would have done justice to his model by incorporating his earlier ideas summarized thus:

> The educational implications of the results on content covered and time spent are that what is taught and how long it is taught are at least as powerful as how something is taught.[38]

An Examination of research into teaching suggests that one of the main developments during the last two decades has

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[37]John B. Carroll, "A Model of School Learning," Teacher's College Record 64 (1963): 732f.

[38]Barak Rosenshine, "Classroom Instruction," in Psychology of Teaching Methods, ed. N. L. Gage (Chicago: University of Chicago Press, 1976), 352.

been a movement away from molar analyses toward molecular ones. Studies of class size, streaming, co-education, and the like have been de-emphasized. Stress appears to have shifted to studies in lesson structure, verbal reinforcement, and classroom management.

Key to the study of classroom environment in molecular terms appears to conceptualize teaching and learning as communicative processes. This being so, the focus of this review now shifts from attempts to examine the instructional environment descriptively to examining it in terms of process-product and its effects on psychological variables (e.g. transmission motivation, and reinforcement) related to instruction in the classroom's teaching-learning process.

This section will provide a review of the literature related to the presentation of instructional material, namely: teacher's input in terms of lecture, re-enforcement and classroom management.

2. Lecture

The lecture is an instructional method which constitutes one of the repertoire of teaching skills. As a teaching device the lecture as an instructional method has been used for may centuries. There is a reasonable aggregate of information within the literature tracing the fifth century pre-Christian academy, the public pleasure-gardens in Athens where Plato and his students gathered. It is thus evident that the lecture method is as ancient as formal education

Additionally, Readings on the origin of lecture seem to indicate that scarcity of manuscripts in the Medieval European Universities prompted an excessive use of lecture (lecture meaning "a reading"). As a method of instruction the lecture method has continued to be dominant despite the criticism that it subjects the student to passivity and restriction to note taking. In college, most teachers see lecturing as both an effective and an efficient way of communicating important information within the limited time available to them. Whereas distinct and consistent differences in the lecturing "styles" of college teachers exists, content and subject area constrains the effectiveness of a lecture and student involvement in learning.

Some studies have claimed the presence of a correlation in a learning environment between student involvement and student gain. Among them are those reviewed by Andrews.[39] While their number is meager, the effects of student involvement on achievement tends to be relatively small and inconsistent.

In reviewing a number of articles on lecture in the Soviet Union, McLeach elaborates the facts that "lecture is a staple teaching technique in the Soviet system of Higher

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[39]J. A. Andrews, "Teaching Format and Student Style: Their Interactive Effects on Learning," Research in Higher Education 14 (Fall 1981): 161f.

Education."[40] Mcleach goes further to indicate the familiar trends of criticism and how the improvement of the teaching style has been visualized by the Russian scholars.

Referencing the work of Nekrosova appearing in the Russian issue of Voprosy Psychology, Mcleach writes:

> The problem as seen by Nekrosova is how to activate the student in the direction of independent thinking that connects with social life and productive labor . . . For this, two basic conditions are necessary. First, the lecture itself must be the result of creative thinking by the lecturer. Secondly, the student must be actively involved in this creative thinking.[41]

Mcleach includes in his discussion the eight basic rules Nekrasova perceives to be useful in activating reflective thinking by students participating in a lecture session. These include (a) finished conclusions should not be presented by the lecturer but rather problems and rules or indication of methods for solving them; (b) Controversial subjects should be introduced and debated, the lecturer at the appropriate stage provides his own view point; (c) The lecturer presents his materials in accordance with the established psychological principles that describe how concepts are actually developed and their relationships to things; (d) The living significance of the materials being dealt with is made clear to the auditors by demonstrating the

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[40]John McLeach, "The Lecture Method," in The Psychology of Teaching Methods, ed. N. L. Gage (Chicago: University of Chicago Press, 1976), 259.

[41]Ibid., 259.

close relation of theory to practice; (e) significant questions are posed by the lecturer either to himself or directly to the students (a dialogue may develop in place of the traditional monologue); (f) Experiments and demonstrations are cited in support of particular viewpoints by the lecturer and by his students; (g) The students are presented with problems arising from the lectures or text-book materials, but which require independent thought for solution; (h) The students are actively encouraged to pose problems and questions to the lecturer, these being dealt with in the concluding session of the discourse.[42]

Observable from these recommendation made by Nekrasova, is an introduction of an entirely different dimension of perceiving the lecture method in instruction. While Nekrasova's perception claims to give focus to a model in lecture method improvement, it does, however, find implications for critical thinking. This, apparently, is due to the reason that many of the steps involve the transmission of content material also used in critical thinking as later presented by Yinger.[43]

Further, Nekrasova's steps would be in agreement with Robert Ennis', (a long-standing authority in critical thinking), recent expansion of his definition of critical

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[42]Ibid., 259f.

[43]R. J. Yinger, "Can We Really Teach Them to Think?" in Fostering Critical Thinking, ed. R. E. Young (San Francisco: Jossey-Bass, 1980), 28.

thinking that now includes a set of thirteen dispositions and twelve abilities.[44] He defines critical thinking generally as "reflective and reasonable thinking that is focused on deciding what to believe or do".[45]

In addition to reviewing the work of Nekrosova, McLeach cites the writing of Ivashchenko[46] who discusses the defects of the lecture in maintaining the interest of large classes in psychology. Mcleach notes the method in which the Russian experimenter conducted his study of class groups of between 100 and 200 students by holding their attention. Using photographs of expressions and emotional reactions, the experimenter invited the students to interpret them in relation to problems posed during the lecture. Mcleach indicated that Ivaschenko recorded "an increase of interest and motivation as a result of this technique," thus yielding an improvement in examination results.[47]

Another related area that has received attention from researchers is that associated with expressiveness of the lecturer and its correlation to student involvement and achievement. A rather popular set of studies discussing this

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[44]Robert Ennis, "A Logical Basis for Measuring Critical Thinking Skills," Educational Leadership, 43 (1985): 44f.

[45]Ibid., 45.

[46]F. I. Ivashchenko, "Solving Psychological Problems as a Method of Teaching Students," Voprosy Psikhologii 12, no. 6 (1966): 172ff.

[47]John McLeach, "The Lecture Method," in The Psychology of Teaching Methods (Chicago: The University of Chicago Press, 1976), 260.

phenomenon is the famous "Doctor Fox Effects". The first of these investigations was conducted by Naftulin and his associates, who invited a professional actor to pose as a visiting professor, under an alias Dr. Myron L. Fox.[48] "Dr. Fox" Presented lectures to three groups of experienced educators.

For the experiment, all the lectures were very dynamic and highly expressive although they were extremely unorganized and low in substantive content. When asked to evaluate the lectures and learning in general, all three groups reported very positive impressions of the lecturer and general satisfaction with the amount that they learned. These results led Naftulin and his associates to concluded that the expressive behavior of a lecturer is as important as lecture's content in determining evaluations and judgements made on the effectiveness.[49]

The results of this experiment had an impact on research in higher education which continued experimenting on expressiveness, content coverage, and the manipulation of various other variables to determine their effects on student's evaluations and achievements. An example of studies that have furthered an investigation into this phenomenon

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[48]D. H. Naftulin, J. E. Ware, and F. A. Donnelly, "The Dr. Fox Lecture: A Paradigm of Education Seduction," Journal of Medical Education 48 (1973): 630-635.

[49]Ibid., 634.

includes those undertaken by Marsh and Ware,[50] Meier and Feldhusen,[51] and two by Williams and Ware.[52] In addition the Dr. Fox study prompted certain researchers to explore the possibility of improving the quality of lectures by training college teachers in drama and acting.[53]

In summarizing the advances in the general understanding brought about by research findings in the areas of teaching and learning, Mcleach reviews the work of Antoinette Ryan who asserts that "this work had resulted in no major change in established procedures (of teaching) in the period 1928-1968."[54] McLeach characterizes Ryan's rationale to imply that "the effectiveness of the lecture compared to discussion is a function of the lecturer, his objectives and the type of

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[50]H. W. Marsh and J. E. Ware, Jr., "Effects if Expressiveness, Content Coverage and Incentive on Multi-dimension Student Rating Scales: New Interpretations of the Dr. Fox Effect," Journal of Education Psychology 74 (1982): 126-134.

[51]R. S. Meier and J. F. Feldhusen, "Another Look at Dr. Fox: Effects of Stated Purpose for Evaluations, Lecturer Expressiveness and Density of Lecture Content on Student Rating," Journal of Education Psychology 71 (1979): 339-345.

[52]R. G. Williams and J. E. Ware, "An Extended Visit with Dr. Fox: Validity of Student Satisfaction with Instruction Ratings After Repeated Exposure to a Lecture," American Educational Research Journal 14 (1977): 449-457; R. G. Williams and J. E. Ware, "Validity of Student Ratings of Instruction under Different Incentive Conditions: A Further Study of the Dr. Fox Effect," Journal of Educational Psychology 68 (1976): 48-56.

[53]H. G. Murray and C. Lawrence, "Speech and Drama Training for Lecturers as a Means of Improving University Teaching," Research in Higher Education 13 (1977): 185-187.

[54]John Mcleach, "The Lecture Method," in The Psychology of Teaching Methods (Chicago: University of Chicago Press, 1976), 279.

student."[55] It appears to Ryan that a lecture has superiority over discussion for the purpose of transmitting information.

TABLE: 2.1

Thoughts About Other Persons and the Self Reported in Lectures and Discussions

	Discussion (Per Cent)	Lecture (Per Cent)
Thoughts about other Persons:		
Thoughts about the student speaking..	0.0	7.9
Thoughts about the instructor.....	3.2	3.8
Thoughts about other persons.....	4.8	3.1
All thoughts about other persons.....	8.0	14.8
Thoughts about the self:		
Thoughts about the self expressive adequacy or inadequacy with respect to the topic and/or other students.	1.6	7.4
Thoughts about the self which are unrelated to the classroom situation.....	3.4	4.3
All thoughts about self.....	5.0	11.7

Source: Benjamin S. Bloom, Though-Process in Lecture and Discussions," Journal of General Education 7 (1953), 165.

This notion is in disagreement with Bloom's perception which finds lectures to be inferior to discussion in facilitating creative and reflective thinking. He writes:

> The lack of pressure on the individual in the lecture classroom is clearly reflected in the thought-processes self reported by students in the lecture classes in only one half of those reported in discussion classes.[56]

An observation made by Jackson notes that Bloom was

[55]Ibid., 279.

[56]Benjamin S. Bloom, " Thought-Process in Lecture and Discussions," Journal of General Education 7 (1953): 166.

placing his argument "on the fact that thoughts during discussions more frequently entail a high order of intellectual efforts than did those occurring during lectures."[57] Bloom's claim is supported statistically in findings included in Table 2:1 showing a statistical significance at p > .1.

Although Bloom's criticism of lecture is valid, he does however note the usefulness of lectures, but only when it comes to impartation of knowledge. He writes:

> . . . if the objective of education is the development of knowledge about a topic or field, the lecture is a far more efficient method of communicating such knowledge and of securing attention of students to these ideas than is the discussion.[58]

He continues:

> . . . if the objective is the development of abilities and skills which are problem-solving in nature, the least efficient discussion is to most of the lecture.[59]

3. Discussion

Elusive in the literature is the place of discussion as a teaching style with students from diverse cultural backgrounds. While research on this area is almost absent, valuable discussions on this subject are contained in

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[57]Philip W. Jackson, Life in Classroom (New York: Holt, Rinehart and Winston, 1986), 96.

[58]Ibid., 169.

[59]Ibid., 169.

linguistic journals and texts. Two studies[60] of North American Indians have concluded that in many ways Indians children are not culturally oriented to classroom verbal participation.

Cadzen and John in their work contained in an anthology: Styles of Learning Among American Indians: An Outline for Research, approach such a phenomenon with a different insight. Their suggestion is that styles of learning, through which Indian children are enculturated at home differ significantly from those to which they are introduced to in the classroom.[61]

In Japan, Kaltinick and Kaltinick have hinted on their frustration in teaching adult-language classrooms which they described as dominated by "awkward silence and impassioned student exhortation that, also, are incomprehensible."[62] The same experience has been characterized by Berwick with statements such as "classrooms full of students who seem extraordinarily unresponsive..."[63] and attempts to direct a

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[60]Harry Wolcott, A Kwakiutt Village and School (New York: Holt, Rinehart and Winston, 1967); Murray Wax, Rosalie Wax and Robert V. Dumont, Formal Education in an American Indian Community, 1 (Kalamazoo, Michigan: Society for the Study of Social Problems, 1964).

[61]Courtney B. Cadzen and Ver P. John, "Learning in American Indian Children," in Styles of Learning Among American Indians: An Outline for Research, ed. C. B. Cadzen (Washington, D.C.: Center for Applied Linguistics, 1968), 65.

[62]Arnold Kaltinick and Clarice W. Kaltinick, "That Elusive Discussion Class: Some Suggestions for ESL Teachers," TESOL Quarterly, 8 (1974): 339.

[63]Richard Berwick, Staging Classroom Discussion," TESOL Quarterly, 9 (1974): 283.

question to one "forces the students to defend himself against what he considers a verbal attack by drawing down a curtain of silence."[64]

Both experimental research and guidance now remain as a task on fuller understanding of socio-linguistic pattern for the purpose of changes in the structuring of classroom learning situations. Although the nature of changes to be made ought to be determined by the educational goals of the particular communities where this type of problem exists, Kaltinick and Kaltinick have attempted to provide a strategy to resolve it.

In their discussion Kaltinick and his partner suggests at least three steps (because of the peculiarity of the subject and the limited guidance provided in the literature, a lengthy quotation of Kaltinick and Kaltinick is called for):

> The resolution of these problems begins with the understanding that a discussion class is not primarily an intellectual exercise, but a language learning experience. And the key to a successful language-learning discussion is to design interesting topics and questions that are within both the intellectual and linguistic competence of the students. Some background, or "common ground" experience, must precede the class discussion itself. The discussion is most effective if the instructor employs a judicial mixture of two types of questions: first, "information retrieval" questions to confirm the background, and then "reaction articulation" questions, i.e those inciting a personal reaction or conceptual answer, to fuel the discussion. The teacher must be primarily a catalytic agent and only rarely an active discourser. He must therefore be careful to correct the students, but not overcorrect, and to direct the discussion class can be an exceptionally

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[64] Ibid., 283f.

> interesting and productive mechanism for developing the student's confidence and improving his language proficiency.[65]

Kaltinick and his partner's suggestions, definitely, runs counter to observations made by Berwick (and were mentioned above), on the effects of questions on Japanese students. Berwick writes: "Even simple questions (which the students would, in other circumstances, be capable of answering), serve to isolate and to maximize cultural interferences."[66] This, therefore, is apt to leading to verbal inhibition rather than facilitating discussion.

The validity of Berwick's argument may be accepted on the benefit of isolation. However, researches in teaching have assigned success to vocalization in the teaching-learning situation. Reiser and his associates at Florida State University have reported that verbalization, especially when questions asking procedures are involved, has a positive effect on learning.[67] The study by Reiser and his associates examined whether a child's learning from a television show could be improved by having an adult asking questions and verbally reinforming the child if his answer was correct.

The subjects for the study composed of middle class

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[65]Arnold Kaltinick and Clarice W. Kaltinick, "That Elusive Discussion," TESOL Quarterly, 8 (1974): 339.

[66]Richard Berwick, "Staging Classroom Discussion," TESOL Quarterly, 9 (1974): 284.

[67]R. A. Reiser, M. A. Tessmer, and P. C. Phelps, "Adult-Child Interaction in Children's Learning form Sesame Street," Educational Communication and Technology Journal, 32 (1984): 217ff.

children (N = 23), ranging in age between 3 and 4 years who were randomly assigned to one of two treatments. All the subjects were exposed to three especially edited versions of "Sesame Street" with an adult.

In the controlled condition, the adult was neither permitted to ask questions nor provide feedback to the child. Those in the experimental condition were continuously asked to name the letters and numbers appearing on the screen during the programs, and were provided with verbal feedback. The findings reported that children in the experimental condition performed significantly better than those in the controlled condition on a delayed post-test ($P < .01$).[68]

The results of the study by Reiser and his associates are a replication of earlier studies performed by Salomon,[69] Filep,[70] and Ball and Bogatz.[71] Salomon randomly divided 93 children from four kindergarten in Israel to two groups. The control group (N = 43) come from a middle-class (MC) background while the experimental (N = 50) were from lower SES backgrounds. The sample was pre-tested with various tests

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[68] Ibid., 222.

[69] G. Salomon, "Effects of Encouraging Israel Mothers to Co-Observe 'Sesame Street' with Their Five-Year Olds," Child Development, 48 (1977): 1146-1151.

[70] R. T. Filep, G. R. Miller and P. T. Gillette, The Sesame Mothers Project (el Segundo, California: Institute for Educational Development, 1971), ERIC, ED 055 676.

[71] S. Ball and G. A. Bogatz, First Year of Sesame Street: An Evaluation (Princeton, N.J.: Educational Testing Service, 1970) ERIC, ED 047 823.

including those constructed and used by Ball and Bogatz for their evaluation of "Sesame Street" in the United States, a modified version of the Children's Embedded Figures Test (EFT) and a test of picture ordering. The Researcher split each of the two groups by half.

One half composed of subjects who did not received minimal or no encouragement at all, while in the second half were those who received encouragement from their mothers who co-observed the "Sesame Street" programs with their child. All subjects were exposed to the program for the entire season that lasted four months and were pre-tested four weeks after the end of the season. Admittedly, the co-observation by mothers significantly affected, positively, the learning of the lower SES subjects. Similar co-observational effects were not found in the MC group, except for field dependency performance where encouragement of the co-observers accentuated SES difference.[72]

An investigation carried by Bartlett on memory and retention suggest that verbalization does indeed increase accuracy of retention.[73] A similar finding has been reported

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[72]G. Salomon, "Effects of encouraging Israel Mothers to Co-Observe 'Sesame Street' with Their Five-Year Olds," Child Development, 48 (1977): 1146.

[73]Frederick C. Bartlett, Remembering: A Study in Experimental and Social Psychology (Cambridge: University Press, 1961), 93.

by Kurtz and Horland[74] whose experiment was designed to test the prediction based on Bartlett's findings.

Kurtz and Horland experimented with sixth and seventh grade pupils (N = 72) at the Wrothington-Hooker Elementary School in New Haven. The experimenters randomly assigned the subjects to two groups. These were designated as the verbalization group (experimental), and the non-verbalization group (control). The entire sample was shown photographs of an array of 16 familiar household objects. The experimental group was given a short sheet containing the names of the objects. In addition, the groups were instructed to locate, encircle, and pronounce the names of each of the objects as the experimenter pointed them out to them one at a time. The control group received photographs of objects and was instructed to individually encircle each object indicated by the experimenter. A recall and recognition test followed several days later.

Kurtz and Horland reported that the differences between the two groups on the combined test were significant for measures of correct and incorrect recognition at $p > .05$ and $P > .01$ levels respectively. On the verbal test both the larger number of correct choices and the lower number of errors by the verbalization group were significant at $P < .05$ level on the visual. The higher number of correct choices by the

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[74]Kenneth H. Kurtz and Carl I. Horland, "The Effects of Verbalization During Observation of Stimulus Objects Upon Accuracy of Recognition and Recall," Journal of Experimental Psychology, 45 (1953): 157-164.

visual group did not approach significance, but the reduced number of errors by the verbalization group yielded a P value of .06. When these data were pooled with the recognition data from the group first given the recall test this difference was reported to be significant beyond the .05 level.[75]

This observation has been mentioned by Cuyno in reporting the effectiveness of a pilot agricultural extension project in the Philippines. Participants received instruction through radio on a regular basis with a focus on improving horti-cultural skills. Cuyno observed that those farmers who participated by listening as a group ("sharing and talking"), demonstrated an ability to assimilate program content and the adaptation of new agricultural practices. Further, they tended to find it easier in modifying and adjusting their technology than their counterparts who listened to the same instruction in isolation.[76]

Accilary Procedures

Both correlational and experimental studies in the literature have reported that interaction, especially, when teacher-directed questions are involved, is important for an acquisition of basic arithmetic and reading skills in primary

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[75]Ibid., 162.

[76]Rogelo V. Cuyno, "Non-Formal Education as a Function Component of Agricultural Extension," in Program of Studies in Non-Formal Education: Case Studies, ed. Russel Kleis (East Lansing, Michigan: Michigan State University, 1974), 332.

school classroom. A review of several studies by Rosenshine[77] reports that Stallings and Kaskowitz[78] in their longitudinal study of classroom identified a pattern of factual question-student response-teacher feedback as most functional for student achievement. Within his discussion, Rosenshine claims that similar results favoring guided practice through teacher questions have been reported by Soar and Soar;[79] Coker, Lorentz and Coker;[80] and Stalling and his colleagues.[81]

Rosenshine summarizes:

> During successful guided practice two types of questions were usually asked by the teacher: questions which called for specific answers and those which called for explanation of how an answer was found.[82]

Rosenshine who also reviewed two other experimental studies whose procedures used guided practice as part of the

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[77]Barak Rosenshine, "Teaching Functions in Instructional Programs," The Elementary School Journal, 30, no. 4 (March 1983): 340.

[78]J. A. Stallings and D. Kaskowitz, Follow Through Classroom Observation Evaluation: 1972-1973 (Menlo Park, California: SRI International, 1974).

[79]R. S. Soar and R. M. Soar, Classroom Behavior, Pupil Characteristics, and Pupil Growth for the School Year and the Summer (Gainesville, Florida: Institute of Development of Human Resources, University of Florida, 1973).

[80]H. Coker, C. W. Lorentz, and J. Coker, Teacher Behavior and Student Outcomes in the Georgia Study, Paper presented at the annual meeting of the American Educational Research Association (AERA), Boston, Spring 1980.

[81]J. Stallings, R. Gory, J. Fairweather, and M. Needles, Early Childhood Education Classroom Evaluation (Menlo Park, California: SRI International, 1977),

[82]Barak Rosenshine, "Teaching Functions in Instructional Programs," The Elementary School Journal, 30 (1983): 330.

experimental treatment observed the importance of high frequency of questions and problems.[83]

1. Feedback

A major teaching functions is responding to pupils answers and correcting error -- feedback. Feedback may be defined as any of the numerous procedures used to tell a learner if an instructional response is right or wrong.[84] Such a definition might help circumvent confusion often caused by rather diffused terms as Correctional Review (CR), Knowledge of the Correct Response (KRC), Knowledge of Response(KR), and other similar terms that have appeared in the literature.

Feedback has been categorized in various ways. Walter and Laniberg have categorized it as abstract or specific, as positive, negative or corrective.[85] Stevens in his study of Puerto Rico makes a distinction between 'service feedback' and 'involvement feedback.'[86] From a rather political context, Stevens discusses various aspects of communication stressing the importance of feedback. He distinguishes between "service

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[83]Ibid., 330.

[84]Raymond W. Kulhavy, "Feedback in Written Instruction," Review of Educational Research, 47 (1977): 211.

[85]D. R. Walter, and W. J. Laniberg, Research on the Effect of Feedback on Writing: Review and Implications (Dallas, Texas: university of Texas, 1976), 42.

[86]Chandler H. Stevens, "Science, Government and Citizen Feedback," Operations Research, 18 (July and August 1970): 4.

feedback" which he relates to personnel complaints, inquires on public information and inquiries on public service. And, "involvement feedback" e.g. more general opinions, suggestions for policy, and the volunteering of persons for more direct involvement in public issues.[87]

An elaborate classification of feedback and the different conditions under which it may be give has been provided by Holding. In his Principles of Training, Holding makes a distinction between intrinsic and artificial feedback. Intrinsic feedback is realized at the point when a problem is resolved while artificial feedback occurs when value is attributed to one's performance in resolving a problem.[88] In the educational setting, artificial feedback is often characterized by the assignment of a grade point to reflect the level of performance. Superior performance receives a higher grade point that may be represented by a letter grade (eg. "A" or "B"), or by a percentage.

Salomon classifies feedback into two general types "positive feedback" which is intended "to maintain the direction of the behavior, and "negative feedback" which functions to reverse the direction of the behavior.[89] This classification and function may not always agree with certain

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[87]Ibid., 4f.

[88]D. N. Holding, Principles of Training (New York: Pergamon Press, 1965), 42ff.

[89]Gavriel Salomon, Communication and Education (Berverly Hills: Sage Publication, 1981), 233.

feedback behavior change and may cause an eruption of confusion. This confusion may be compounded by an easy misinterpretation in the context of knowledge and results. For example, feedback forced by use of the word "right" is positive feedback because it increases the tendency to repeat the action and not because the feedback is pleasant.

Discussions on feedback in the literature presents the subjects as one composed of two polarities. The first has to do with the place and appropriateness of feedback in the teaching learning experience: namely, if it should be delayed or provided immediately. The second inconsistency treats feedback as of virtually no effects in the teaching-learning experience.

A review of the literature investigating the latter inconsistency indicate that certain studies claim to have found no significant difference in the overall performance between groups provided with feedback and those not provided. A study undertaken by Sutton and Allen of a randomly selected sample of entering freshmen, manipulated both the practice and the feedback.[90] Sutton and his associate randomly assigned his sample (N = 112) to five class sections. Written compositions were collected and standardized tests were given in the first two weeks of a semester and again at the end of the semester.

During the ten-week period between the two tests,

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[90]J. T. Sutton and E. D. Allen, The Effects of Practice and Evaluation on Improvement in Written Composition: Cooperative Research Project 1963 (Deland, Florida: Stetson University, 1964), 7.

instruction varied from section to section. Sutton et al., procedures were thus: control group: students completed the post-test immediately following completion of the pre-test at the beginning of the semester.

Treatment group one: no written composition were done during the ten week period; all class time was devoted to the study of literature. Treatment group two: like group one no written compositions were done during the semester. However, at the first class session each week, each student read and judged papers written by the students in group three. During the second class session, each student reviewed a rewritten paper from the sub-sample in treatment group three. During the third session, each student reviewed a re-written paper which he had corrected originally.

Treatment group three: At the beginning of each session, each student wrote a paper. Having been corrected by student in group three the paper was reviewed and rewritten during the second class session.

Treatment group four: procedures were identical to treatment group two, except that the paper was corrected by the instructor, was reviewed during the third session and written.

Sutton and his associate reported that they found no significant difference among the magnitudes of gains between the five sub-samples. Each student's pre- and post-test compositions were evaluated in several ways and the results disclose no group exhibited any significant improvement in

writing abilities.[91]

Although remotely related to the present study, but certainly relevant to any discussion on feedback is the famous study done by Centra on the effectiveness of students ratings.[92] Centra was interested on how students' ratings affects teacher performance. He worked with five types of colleges with teachers randomly assigned to one of three groups. One group administered student rating forms to students at mid-semester.

These rating forms contained 23 items asking judgements on certain instructional procedures and behavior of teachers. These items covered areas ranging from the overall organization of the course to the availability of the teacher to students.

The evaluated teachers received a summary of the results within a week along with some comparison data to help them interpret the research data. The second group, which served as the control group, administered the forms at the same time as group one but did not receive feedback until the end of the semester. In addition, both group one and group two administered a similar form at the end of the semester. The third group administered the forms at the end of the semester only.

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[91] Ibid., 14.

[92] John A. Centra, Strategies for Improving College Teaching (Washington, D.C.: American Association for Higher Education, 1972).

Centra, to his amusement, reported no significant difference between the scores for the three groups. This was true for instructors in all disciplines irrespective of gender and years of experience.[93] While Centra does not rule out the usefulness of feedback, he boldly assigns this effectiveness in improving teaching to a limited capacity.[94]

Teaching procedures developed from the direct instruction model[95] emphasize immediate feedback as an essential instructional component. Pehrsson, for example, investigated the reading comprehension effects of teacher "interference" during oral reading.[96] His subjects were 25 graders of average reading skills. For the experiment, each of them was instructed to read three different passages under three different treatment conditions.

The first condition read the passage audibly and uninterrupted. The second condition read audibly paying attention to individual words. Immediate feedback was provided following reading error. The third treatment condition read the passage audibly paying attention to individual words but were not provided with corrective

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[93]Ibid., 21.

[94]Ibid., 21.

[95]W.C. Becker and S. Englemann, "The Direct Instructional Model," in Encouraging Change in America's Schools: A Decade of Experimentation, ed. R. Thine (New York: Academic Press, 1977), 78.

[96]R. S. V. Pehrsson, "The Effects of Teacher Interference During the Process of Reading of How Much of a Helper is Mr. Gelper," Journal of Reading, 17 (1974): 617ff.

feedback. In each case, students' story-telling was recorded after each passage was read.

Utilizing the Reading Miscue Inventory (RMI), Pehrsson scored story retelling and subsequently, compared scores under each treatment. The results reported significant differences between scores with the corrective feedback treatment group attaining a superior performance.[97] Similar findings have been reported by Niles and his associates[98] and Fleisher[99] who separately studied corrective feedback effects on comprehension.

The effects of delayed feedback as a facilitator of retention of the instructional content has been a recurrent subject in the literature for many years. Several studies have shown that delayed feedback is superior to immediate feedback. A review of the literature by Kulhavy cites a number of studies that have attempted to investigate this assumption.[100]

A study given to 160 college students by Sassenrath and

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[97]Ibid., 620.

[98]J. A. Niles, R. T. Graham, and J. C. Winstead, "Teacher Feedback as a Factor in Children's Oral Reading," Reading in Virginia, 37 (1979): 17.

[99]L. S. Fleisher, "The Effects of Word-Emphasis and Comprehension Emphasis: Instruction on Reading Performance" (Ph.D. diss., University of Illinois, Champaign, 1979), 86.

[100]R. W. Kulhavy, "Feedback in Written Instruction," Review of Educational Research, 47 (1977): 211.

Yonge[101] composing 60 multiple choice question tested students on the effects on delayed feedback on retention. The experiment gave feedback to half of the sample immediately and the other half 24 hours later. The type of feedback was varied. The immediate feedback group received question responses only which the delayed feedback group received the stem of the question and correct responses. Sassenrath and his colleague reported that the group receiving delayed feedback scored better that the immediate feedback group.[102] Similar results were found in a late study by Sassenrath and Yonge.[103]

Further, a study with junior high school students, Moore attempted to investigate the effects of feedback delays ranging from immediate to four days on learner performance. Moore recounted that his findings indicated an inferiority of immediate feedback to delayed in both acquisition and retention of instructional material.[104]

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[101]M. Sassenrath and S. D. Yonge, "Delayed Information Feedback," Journal of Educational Psychology, 59 (1968), 69-73.

[102]Ibid., 72.

[103]J. M. Sassenrath and G. D. Yonge, "Effects of Delayed Information Feedback and Feedback Cues in Learning on Delayed Retention," Journal of Educational Psychology, 60 (1969): 174-177.

[104]A. J. Moore, "Delay of Feedback and the Acquisition and Retention of Verbal materials in the Classroom," Journal of Educational Psychology, 60 (1969): 341.

Kulhavy and Anderson's[105] study of high schools students confirmed previous results on the subject. The study tested a sample on an assortment of topics in introductory psychology under diverse conditions of immediate and delayed feedback. A retest completed after a week showed that the delayed feedback groups performed significantly better than the immediate feedback groups.[106]

The beneficial effects of delayed feedback and delayed retention have been explained by two theories. The first theory is the interference-preservation whose premise claims that over the delayed feedback the initial wrong responses are forgotten more readily and less proactive interference occurs when learning the correct response from feedback.[107] The second, developed by Sassenrath,[108] is a verbal facilitator theory which assumes that delayed feedback subjects have more time than immediate feedback subjects to make use of response produced by verbal cues originating from the stimulus materials.[109]

In contrast to the interest in the feedback interval,

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[105]R. W. Kulhavy and R. C. Anderson, "The Delayed Retention Effect with Multiple-Choice Test," Journal of Educational Psychology, 60 (1969): 339-342.

[106]Ibid., 510f.

[107]J. R. Surber and R. C. Anderson, "Delay-Retention Effects in Natural Classroom Settings," Journal of Educational Psychology, 67 (1975): 171

[108]J. M. Sassenrath, "Theory and Results of Feedback and Retention," Journal of Educational Psychology, 67, (1975): 896f.

[109]Ibid., 898.

there is relatively little attention that has been given to other factors affecting the effects of feedback in classroom setting. Thus, little is known about the effects of different forms of feedback. An examination of the literature shows that various procedures have been applied to provide students with informative feedback, but that little systematic study of the specific effects of these procedures has taken place. One example of these type of studies is the experiment by Sassenrath and Garverick in which three forms of feedback were compared: (a) looking up wrong answers in the textbook; (b) having answers discussed by the instructor, and (c) checking over answers from correct ones on the board.[110]

Subjects in all three conditions obtained significantly higher scores on a retention test than a control group who looked up answers in the test-book. Of special interest the discussion group also did significantly better that the no-feedback group on a transfer test consisting of new items that had not appeared in earlier testing.[111]

Kulhavy, who makes a thorough review on the subject, recommends for teachers to:

> first make sure the learners have appropriate entry skills for the lesson; second, structure the material in such a fashion that the response precedes the feedback in spite of the student. Finally, provide feedback as often as possible during the course of the lesson. If teachers follow

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[110]J. M. Sassenrath and C. M. Garverick, "Effects of Differential Feedback from Examination on Retention and Transfer," Journal of Educational Psychology, 56 (1965): 239ff.

[111]Ibid., 260f.

> these guidelines, they should reap the best that feedback has to offer and more importantly their students will have a better chance of learning what is put before them.[112]

Non-experimental research has attested to the efficacy of feedback; immediate versus delayed feedback; or opportunity for practice. However, little has been studied on praise in terms of feedback. Rather, it has appeared in many studies as diagnostic information. Examples of some of these studies includes those done by Sullivan, Schultz, and Baker;[113] Melching;[114] Boydell;[115] and Benowitz and Rosenfeld.[116]

Stallings and Kakowitz correlational study of various types of feedback with cognitive outcomes suggests that the topic of feedback (academic, behavioral, and other tasks), is more important than the type of feedback (positive, negative, or neutral).[117] It appears in the literature as though

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[112]Raymond W. Kulhavy, "Feedback in Written Instruction," Review of Educational Research, 47 (1977): 239.

[113]H. J. Sullivan, R. E. Schultz, and R. L. Baker, "Effects of Systematic Variation in Reinforcement Contingencies on Learning Performance," American Educational Research Journal, 8 (1971): 135ff.

[114]W. H. Melching, "Programmed Instruction Under a Feedback Schedule," National Society for Programmed Instruction Journal, 5 (1966): 14f.

[115]D. Boydell, "Pupil Behavior in Junior Classrooms," British Journal of Educational Psychology, 45 (1977): 122ff.

[116]M. L. Benowitz and J. D. Rosenfeld, "Three Types of Incentives and Classroom Learning of Middle and Lower Class Children," Psychology in School, 10 (1973): 79f.

[117]J. A. Stalling and D. H. Kaskowitz, Follow Through Classroom Observation Evaluation (Menlo Park, California: Stanford Research Institute, 1974), 33.

earlier reviews have tended to show negative feedback or criticism as being negatively related to achievement. The findings of Stallings and Kaskowitz[118] negate this observation as do those of Brophy and Everston.[119]

Stallings and Kaskowitz found that, in general, the most successful teacher of low SES pupil motivated them primarily through gentle and positive encouragement and praise.[120] It should be noted here that praise could be effective on certain types of pupils and ineffective in others.

2. Praise

It is apparent in the literature that the relationship of praise to achievement is a subject that is still under discussion. However, for praise to pay off in achievement terms, it has to (a) relate clearly to the topic under consideration;[121] (b) be genuine and credible rather than half hearted;[122] and (c) be used judiciously in relation to

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[118]Ibid., 38f.

[119]Jere E. Brophy and C. M. Evertson, Learning from Teaching (Boston: Allyn and Bacon, 1976).

[120]J. A. Stalling and D. H. Kaskowitz, Follow though Classroom Observation Evaluation (Menlo Park, California: Stanford Research Institute, 1979), 38ff.

[121]C. Whetton and R. Childs, "The Effects of Item by Feedback Given During an Ability Test," British Journal of Educational Psychology, 51 (1981): 341f.

[122]A. H. Buss, M. Weiner, and E. Buss, "Stimulus Generalization as a Function of Verbal Reinforcement Combinations," Journal of Experimental Psychology, 48 (1954): 435.

individual differences.[123]

The object of praise is to set a dais for a favorable learning environment and to encourage students' success and not a proto-type of Charles Dicken's novel[124] character named Thomas Gradgrind. As a teacher, Gradgrind exibited continously an assertive negative influence over his students. Through the use of questioning he baited; feedback he scoffs; and assisting he angers his students.

The work of DeStefano and Pepinsky,[125] have investigate the effects of praise on student performance and learning. DeStefano and Pepinsky found that teachers used praise twice as often as negative statements and criticism.[126]

Further, they reported that student's replies were more often accepted but were rarely ignored.[127] A review of the study by Morine-Dershimer and Tenenberg done by Green and Smith indicated that pupil responses that drew teacher praise were reported during students interview as

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[123]R. C. Anderson and G. W. Faust, "The Effects of Strong Formal Prompts in Programmed Instruction," American Educational Research Journal, 4 (1967):345ff.

[124]Charles Dickens, Hard Times For these Times (London: Oxford university Press, 1955).

[125]J. DeStefano and H. Pepinsky, Learning of Discourse Rules of Culturally Different Children in First-Grade Literacy Instruction (Washington, D.C.: National Institute of Education, 1981)

[126]J. DeStefano and H. Pepinsky, Learning of Discourse Rules of Culturally Different Children in First-Grade literacy Instruction (Washington, D.C.: National Institute of Education), 14.

[127]Ibid., 14f.

being heard more frequently than other types of responses.[128]

Students' definition of the appropriateness of praise and perception of praise was found to be related to their participation in class discussions and, therefore to their reading achievements.[129] These conclusion resemble findings by Brophy and Everston[130] and Brophy[131] in providing a comprehensive understanding of the nature and use of praise in classrooms (Figure 2.2). From these observations, Green and Smith concluded that a significant correlation exists between participation and reading achievement.[132]

Classroom Management Procedures

A concept relevant to any study of classroom interaction is one related to classroom management. According to Ned Flander, this concept falls under categories (1) through (7) that he labels as teacher influence and may be classified as either direct or indirect.[133] Flander acknowledges that verbal

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[128]Judith L. Green andDeborah Smith, "Teaching and learning: A Linguistic Perspective," Elementary School Journal, 83 (1983): 381.

[129]Ibid., 381.

[130]J. Brophy and C. Everston, Learning from Teaching: A Development Perspective (Boston: Ally and Bacon, 1976).

[131]Jere Brophy, "Classroom Organization and Management," Elementary School Journal, 83 (March, 1983): 265ff.

[132]Ibid., 381.

[133]Ned A. Flander, Knowledge AboutTeacher Effectiveness (New Orleans: American Educational Research Association, 1973), 3, ERIC, ED 088 875.

Figure 2.2.

Guidelines for Effective Praise

EFFECTIVE PRAISE	INEFFECTIVE PRAISE
Is delivered contingently.	Is delivered randomly or unsystematically.
Specifies the particulars of the accomplishment.	Is restricted to global positive reaction.
Shows spontaneity, variety, and other signs of credibility; suggests clear attention to the student's accomplishment.	Shows a bland uniformity which suggests a conditioned response made with minimal attention.
Rewards attainment of specified performance criteria (which can include effort criteria, however).	Rewards mere participation without consideration of performance processes or outcomes.
Provides information to students about their competence or the value of their accomplishments.	Provides information at all or gives students information about their status.
Orients students toward better appreciation of their own task related behavior and thinking problem solving.	Orients students toward comparing themselves with others and thinging about competing.
Uses students' own prior accomplishments as the context for describing present accomplishments.	Uses accomplishments of peers as the context for describing students' present accomplishments.
Is given in recognition of noteworthy effort or success at difficult (for this student) task.	Is given without regard to the effort expended or the meaning of the accomplishment (for this student).

of that particular social system.[137]

In the literature on classrooms, there are two recurrent analytical concepts: activities and tasks. The concept of activity, used extensively in the works of Gumps[138] have definitely been extracted from the ecological psychology literature and has been designated as a "bounded segment of classroom time characterized by an identifiable . . . focal content or concern; and . . . pattern or programs of action.[139] Doyle assigns the derivation of the concept of "task" to the literature on human cognition which refers to the way in which information-procession demands of an environment are structured and experienced.[140] When this term is transferred to the learning environment it assumes both the goal and functions designed to achieve them.[141] In that

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[137]James D. Moonery, The Principles of Organization (New York: Harper and Brother, 1939), 7.

[138]Paul V. Gump, The Classroom Behavior Setting: Its Nature and Relation to Student Behavior (Washington, D.C.: Office of Education, Bureau of Research, 1967), ERIC, ED 015 515; Paul V. Gump, "Intra-setting Analysis: The Third-Grade Classroom as a Special but Instructive Case," in Naturalistic Viewpoints in Psychological Research, ed. Harold L. Rausch (New York: Holt, Rinehart and Winston, 1969), 200-220; Jacob S. Kounin and Paul V. Gump, "Signal Systems of Lessons Setting and the Task-Related Behavior of Pre-School Children," Journal of Educational Psychology, 66 (1974): 554ff.

[139]Walter Doyle, " How Order is Achieved in Classrooms: An Interim Report," Journal of Curriculum Studies, 16 (1984): 259.

[140]WalterDoyle, "Making Managerial Decisions in Classrooms," in Classroom Management, ed. D. L. Duke (Chicago: University of Chicago Press, 1979), 45.

[141]Douglas Barnes and Frankie Todd, Communication and Learning in Small Groups (London: Routledge and Kegan Paul, 1977), 2.

capacity, therefore, a task is what constitutes the demand laid upon students and executed by teacher "to gain and maintain corporation in classroom activities.[142]

Given this definition and, subsequently, the function, the behavior of teachers is directed to the operations characterized with an effort to accomplish the tasks. A review by Ornstein and Levine of two works on classroom management yielded several techniques that effective teachers utilize in developing productive discipline in the classroom. Ornstein and Levine identifies thus:

> Effective teachers do the following: 1) They make sure that students know what the teacher will not tolerate; 2) They make certain that students know what to do if they need help or if they complete assignments early; 3) They follow through with reminders and rewards to enforce rules; 4) They provide smooth transition between activities; 5) They give students assignments of sufficient variety to maintain interest; 6) They monitor the class for signs of confusion or inattention; 7) They use variations in eye contact, voice, movement, and academic activities to focus attention during lessons; 8) They do not respond to discipline problems emotionally; 9) They arrange the physical environment to complement their instructional objectives and methods.[143]

In drawing lessons for teaching practices from empirical studies, Hawley and his associates have linked classroom management to students' achievement. Management here denotes

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[142]WalterDoyle, "Making Managerial Decisions in Classrooms," in Classroom Management, ed. D. L. Duke (Chicago: University of Chicago Press, 1979), 47.

[143]Allan C. Ornstein and Daniel V. Levine, AnIntroduction to the Foundations of Education, 3d. ed., (Boston: Houghton Mifflin Company, 1985), 522-523.

the structuring and arrangement of classroom conditions and students behavior under which instruction can occur. In their published monograph, they indicated that effective classroom management is a function of effective teaching.[144]

Griffin has analogized the school as a "work place" and the teacher as "the master teacher".[145] This same analogy has been used earlier by Brophy who hesitated to call the teacher a "master teacher" by choosing to call him a "manager".[146] The label "manager" was first used by Berliner who assigns the teacher (manager) the task of performing executive functions.[147]

These functions have been summarized in What Work: Research about Teaching and Learning, thus:

> Effective managers in the classroom do not waste valuable minutes on unimportant activities; they keep their students continuously and actively engaged. Good managers perform the following time-conserving functions: Planning class work: choosing the content to be studied, scheduling time for presentation and study, and choosing those instructional activities(such as grouping, seatwork, or recitation) best suited to learning the material at hand; Communicating Goals: setting and conveying expectation so students know what they are to do, what it will take to get a passing grade, and what

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[144]Willis D. Hawley, SusanJ. Rosenholtz, Henry Goodstein and Ted Hasselbring, "Good Schools: What Research Says About Improving Students' Achievement," Peabody Journal of Education 61, no. 4 (1984): 18.

[145]Gary A. Griffin, "The School as a Work-place and Master Concept," The Elementary School Journal, 86 (1985): 4.

[146]Jere E. Brophy, "Classroom Organization and Management," The Elementary School Journal, 83 (March 1983): 267.

[147]D. Berliner, "The Executive Functions of Teaching," The Instructor 93, no. 2 (September 1983): 28.

> the consequence of failure will be; Regulating learning Activities: sequencing course content so knowledge builds on itself, pacing instructions so students are prepared for the next step, monitoring success rates so all students stay productively engaged regardless of how quickly they learn, and running an orderly, academically focused classroom, that keeps wasted time and misbehavior to a minimum.[148]

When all these functions are managed effective, students' achievement is enhanced. Studies on effective teaching have consistently demonstrated significant relationships between academic learning time, which is a function of good management, to academic achievement.[149] An exhaustive review of 25 of studies made by Walberg reported positive effect.[150]

All these studies have indicated the successful endeavors of the teacher (manager), utilizing various strategies, to maximize the time their students spend engaged in academic tasks. Hawley, Rosenholtz, Goodstein, and Hasselbring[151] have suggested 7 strategies towards effective teaching through good classroom management. These include:

William J. Bennet, What Works: Research About Teaching and Learning (Washington, D.C.: U.S. Department of Education, 1986), 34.

[149]B. Rosenshine and D. Berliner, "Academic Engaged Time," British Journal of Teacher Education 4 (1978): 13.

[150]H. J. Walberg, "What Makes Schooling Effective? A Synthesis and A Critique of Three National Studies," Contemporary Education: A Journal of Reviews 1, No. 1 (1984): 22f.

[151]Willis D. Hawley, SusanJ. Rosenholtz, Henry Goodstein and Ted Hasselbring, "Good Schools: What Research Says About Improving Students' Achievement," Peabody Journal of Education 16, no. 4, (1984): 21-23.

(1) structuring of physical space; (2) efficiently managing time; (3) maintaining student focus of attention and engagement; (4) establishing and maintaining standards for student behavior; (5) giving students responsibility; (6) pacing student work rate; (7)and, using advanced organizers.[152]

Research undertaken within a different theoretical focus also have implication for classroom management practice. Much of the research on classroom management has involved attempts to decrease descriptive behavior and increase task oriented behavior. This has been so due to the assumption that these behaviors are precursor to improve academic performance. It is evident in literature that the amount a child spends on a task can be increased and the amount of disruption decrease by reinforcing achievement.

Studies based on reinforcement theory have tended to be experimental in nature and rather than using achievement as the dependent variable they have used pupil behavior. Praise, material incentive, extrinsic token and other procedures have been shown to be effective in controlling pupil task involvement. However, criticism is evident on the methodological shortcomings of such research. Among them is a critical review by Dunkin and Biddle, who after all admit that the findings are consistent.[153]

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[152]Ibid., 22-23.

[153]M. J. Dunkin and B. J. Biddle, The Study of Teaching (New York: Holt, Rinehart and Winston, 1974), 121.

Another criticism is evident in the work of Lepper and Green whose objection of such reinforcement lies on the premise that such reward may reduce the degree to which pupils find working or on completing school task to be intrinsically rewarding.[154] Brophy follows the suit when he writes:

> . . . the degree to which this is likely to occur depends on the degree to which students are led to believe that they are performing solely to obtain the extrinsic rewards and not because the performance is inherently satisfying or involve the acquisition or exercise of value skills.[155]

In providing guidelines on the use of such reinforcements, Brophy draws on his earlier work and suggests that the same guideline should be applied to the use of reinforcers.[156]

D. DISCUSSION ON KENYA

This section sets forth a short but comprehensive background of the site of the study. It provides material that is surmised to cast light on Kenya's socio-economic framework since this is assumed to determine the strategy for the development of a country's educational system. This section explores three basic areas. First, it examines the socio-economic background in relationship to Kenya's economy and the movement of the population. Second, it traces the

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[154]M. Lepper and D. Green, The Hidden Costs of Reward: New Perspective on the Psychology of Human Motivation (Hillside, N.J.: Erlbaum, 1978).

[155]Jere E. Brophy, "Classroom Organization and Management," The Elementary School Journal 83, (1983): 273.

[156]Ibid., 273.

historical background from the pre-colonial era to the early independence years. Finally, it presents a discussion of Kenya's education background has been presented with special focus given to curriculum reforms and instructional radio.

Socio-Economic Background

1. Population

A study prepared for the International Labour Office (World Bank), noted that "many African countries are currently experiencing fertility rates and population growth rates which are unparralled historically.[157] With a population growth rate of at least 4.0 percent per annum, Kenya definitely has one of the fastest growing population in the world. Simple calculation indicates that if the fertility rate is maintained at the current level, Kenya's population will double its present estimated population figure of over 20 million within the next 20 years.

Anker and Knowles, acknowledge: "due to these high population growth rates, Kenya has a very young age distribution. Approximately one-half of the population is below 15 years of age."[158] An average household contains nearly six persons. As a result, Kenya has one of the highest

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[157]Richard Anker and James C. Knowles, Fertility Determinants in Developing Countries: A Case Study of Kenya (Liege, Belgium: Ordina Editions, 1982), 1.

[158]Richard Anker and James C. Knowles, Population, Growth, Employment and Economic-Demographic Interactions in Kenya: Bachue -Kenya (New York: St. Martin's Press, 1983), 10.

dependency burdens in the world, with more than one person outside the labor force age group for each person within it.[159]

While birth rates remain high, official government statistics tend to indicate that the mortality rates are fairly typical of a developing nation. The life expectancy at birth of approximately 50 years for both sexes and rising.

Kenya's population growth suggests an immediate need in the reduction of the current runaway birth rate to ease the task of meeting basic needs. For example, the World Bank suggests that:

> a reduction in birth rate would alleviate the burden on the education and health systems relatively rapidly, while the effect of employment would not be felt in this century since most potential entrants during the period have already been born.[160]

Hazlewood comments:

> The youthfulness of the population has, of course serious implications for the provision of education. Although the provision of education in Kenya compares well with that in many other countries, it is still woefully inadequate in total, as well as in other ways.[161]

Faraque and his associates at the World Bank have identified four effects of high fertility rate on the Kenyan economy:

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[159]World Bank, Country Study, Vol. 2, Kenya: Growth and Structural Changes (Washington, D.C.: The World Bank, The International Bank for Reconstruction and Development, 1983), xvi.

[160]Ibid., xvi.

[161]Arthur Hazelwood, The Economy of Kenya: The Kenyatta Era (Oxford: Oxford University Press, 1979), 3f.

> i) the effects of diminishing returns in agriculture associated with population growth pressures on land and other natural resources, which tend to lower agricultural output per capita; ii) the effects of a high dependency burden on the nature of consumption and the possibility of saving; iii) the effects of labor force growth on the aggregate employment situation; and iv) the effect of population growth on the pattern of public expenditure, especially with regard to the basic human need objectives.[162]

Despite the gravity of Kenya's population, there is little evidence of any widespread campaign to create public awareness of the danger of a runaway birth rate (Table 2.2), far less a measure designed to reduce the present 4.3% per annum rate, apart from the pious hopes.

TABLE 2.2

Population Movement in Kenya
in the Last Twenty Years

Year	Population	Crude Birth	Crude Death Rate/1000	Percentage Rate/1000 of Annual Increase
1969	10,942,705	49.63	17.14	3.249
1974	13,039.307	52.64	15.64	3.691
1979	15.847,979	54.62	14.20	4.042
1984	19,563,008	52.85	12.66	4.019
1989	24,016,077	51.98	10.42	4.156

SOURCE: S. H. Ominde, Population and Development in Kenya (London: Heinemann Educational Books, 1984), 104.

If the annual birth rate continues at an unchecked state

[162]Rashid Faraque, et. al., Kenya: Population and Development (Washington, D.C.: The World Bank, Development Economics Department, 1980), 43.

it would, undoubtedly, be accurate to estimate that the Kenya's population is susceptible to signigicant multiplication. If this is accurate, then Kenya must expect its capital resources to be strained to the limit within the next few years. These economic pressures will be particularly severe because of the enormous educational training need of the country's ever burgeoning youth population.

2. Debt and Development

Kenya, like the rest of the countries in the developing world, is economically underdeveloped with a very low ranking on the measure of world economic development. While the economic situation in Kenya ranks high compared to most African countries whose economies have been, and their prospects remaining, grim and frightening, Kenya inhibits poverty, "a condition of life so characterized by malnutrition, illiteracy, disease and low life expectancy as to be beneath any reasonable definition of decency."[163]

A country that has to make payment to another is confronted, simultaneously, with both budgetary and transfer problems. The budgetary problem is the country must generate a particular amount of resources from within the domestic economy; the transfer problem is that the domestic resources must be converted into foreign exchange.

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[163]Gerald E. Scott, Debt and Development: The Modern Transfer Problem in Sub-Saharan Africa" (Ph.D. diss., University of Maryland, 1987), 30.

At present, Kenya has its foreign debt established at approximately $4.0 billion. Even with its annual aid flow averaging about KShs. 5.8 billion, Kenya relies heavily on its export revenues in maintaining its infrastructures. This being so, the obligations in providing education which absorbs more than 30% of the budgetary funds places a heavy burden on government revenues.

Historical Background

Although the East African Coast had been considered in the past as part of the "dark continent" by the early Europeans, it was not a new comer to the world scene of commerce. It was known by both Asian and Greek cultures as the 'Cape of Good Hope.' Further, the Portuguese's territories had expanded southward, in the 14th century to include Sofala and Kilwa (the major funnels of the interior gold mines), forcing their rulers to pay annual tributes to Portugal. By 1505, Mombasa and Malindi were both captured, and so was Lamu which humbly yielded to the trained forces of Portugal.

The control of these towns was, in subsequent years, tossed between the Turks led by Mirale Bay, the Arabs through the Omani empire, and the Portuguese through their well trained military. In later years, their control gained an added element at the arrival and intervention of the man-eating Zimba tribe. Their arrival displaced the Turks completely after their leader, Mirale Bay, escaped to seek

refuge in the hands of the Portuguese who in turn delivered him to Lisbon as a prisoner. The battle over controls was, thus, left to the Portuguese and the Zimba people.

The Omani rulership remained in the coast, prospering in the export of trade to the Near East, until the British intervention in years after the 1807 prohibition act, and the 1822 Moresby Treaty prohibiting Arab slave traders from shipping slaves to India or Mauritius. However, the British influence did not heighten until the death of the sultan of Zanzibar, Seyyid Said, in 1856, and the succession of Seyyid Barghash a son of Seyyid Said who proved to be weak.

In 1895, Britain declared a take over of the East African Protectorate (Kenya), by military force fighting against individual ethnic and tribal units. Many African groups reaction to such violent intrusions was to resist in order to safeguard their way of life and values and to maintain control over themselves. However, total control of the territory was realized after the completion of the railway from the shores of Mombasa to Lake Victoria in 1901.

The World War II years witnessed open discontent, from the Kenyans, of the European domination that forced heavy recruitment, among other issues, of porters to serve in the British armed forces. This marked the beginnings of the Kenyans interests to focus on the central government to an extend that they even pressed their claims in London. During this period, Kenyans formed their first political organizations to protect their interests. While their attacks

were not directly opposed to the colonial system, they however, concentrated on getting various issues redressed. Such seething discontent remained strong to the point that violence eruptioned through the Mau Mau movement in the early 1950's when both the settlers and the Kenyans took law into their own hands. The Kenyans fought with hopes to change the colonial system of economy and social injustices. Out of the pressure expended by the Kenyans, resulted in a series of historical conferences in the early 1960's in which Kenyans gained added constitutional rights that led to the declaration of independence in 1963.

Educational Background

1. Early Colonial Era

The historical foundations of formal Western education in Kenya is inseparable with the history of early visitors to the coastal towns of Kenya. Prior to their arrival, Africans had depended on indigenous educational systems whose aim was to ". . . fit the growing child properly into the traditional society."[164] Each tribe had its own educational pattern, however, they all perpetuated the permanency and value of their traditions and customs, geared to the preparation of useful members to society.

Formal education was, therefore, not new to the African population at the arrival of the Europeans at the close of the

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[164]Mzee Jomo Kenyatta, My People of Kikuyu (Nairobi: Oxford University Press, 1966), 58.

ninteenth century. Reading and writing was, however, not widespread. It was, certainly, present as evidence by the testimony of Kraft who visited chief Kimweri of Usambara in 1848 and found out that ". . . (he) had two sons who have become Mohammedans and write."[165]

To the early missionary, the school was an important component to his work. The success in promulgating the Christian rudimentary tenets relied, to a great extend, on some from of literacy. Smith, quoting Father Liberman of the Holy Ghost Fathers in Tanzania, writes:

> I understand that it would cost the missionaries very much to act as teachers. Nevertheless, it is urgent to take this state in order to consolidate their efforts and aims at the formation of a coloured clergy, of teachers and of catechists. In my opinion, to abandon the school is to destroy the importance of the mission...[166]

Additionally, a recent dissertation written for the University of California, Bell argued that the missionaries used the schools for:

> . . . easy access to indoctrinating young children who were no longer under the say of their own cultural values and social norms into Christianity and European values . . . it functioned as a social means of gaining entrance into a tribal group's political and economic structures and, over time, the opportunity to change these structures to comply

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[165]Irving Kaplan, Area Handbook for Kenya (Washington, D.C.: American University, 1976), 149.

[166]Anthony Smith, "The Missionary Contribution to Education (Tanganyika), to 1914," Tanganyika Notes and Records, 60 (March 1963): 93.

with the missionary concept of civilization.[167]

The most common type of schools that the missions sponsored were called "bush schools" and were set up in the small outlying villages that surrounded the central mission stations. These schools were taught by "bush teachers," a category of teachers that were exclusively Africans who held very limited training qualifications. In most cases, the "bush teacher" was also the preacher or the evangelist on Sunday.

"Bush teachers" aimed, first, at teaching the rudiments of the Christian faith and, second, reading and writing. A pupil's successful completion of the four year course qualified him for an additional year of training as a teacher, a nurse, or a minister. This additional year of training presented specialized training that was not, "designed to carry the student's academic education any further."[168]

The educational needs of the Kenyans was not of utmost concern to the colonial government until after 1911 when the Kenya Education Department was instituted. The department maintained a reserved liaison between the government and the missionaries. Expansive action by the department were, however, never undertaken until after the Phelp-Stroke

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[167]James R. Bell, "Forward Education and Local Socialization Among the Wataita of South-Eastern Kenya: An Anthropological Perspective (Ph.D. diss., University of California, Santa Barbara, 1988), 17.

[168]J. G. Steyler, Educational Adaptations with Reference to African Village School (London: Sheldon Press, 1939), 35.

commission's report of 1924 which propagated need to train the Kenyan elite and the subjection of the residual majority to land related training.

Following World War I, the British Colonial government began to concern herself with the nature of education provided to the African population. An impetus to this concern was given earlier in the first report of the Phelps-Stroke commission in 1922 when it focused on the West African colonies. Two years later, the second report of the Phelps-Stroke commission that concentrated on the East African colonies drew attention to

> . . . the unfortunate divergence in the attitudes of missionaries, settlers and government officials toward native education, and to the present confusion of the educational thought and practice and failure to define the aims of education.[169]

Although there was an agreement on the need to provide formal Western education to the Africans following the issuance of the 1925 Colonial Office White Paper, there was, however, clear disagreement as to the extend, method and pace at which education should proceed.[170]

2. Curriculum Development and Educational Quality

Educational aims in traditional Africa were aimed at

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[169]T. P. Gorman, "The Development of Language Policy in Kenya With Particular Reference to the Educational System," in Language in Kenya, ed. W. H. Whiteley (London: Oxford University Press, 1974), 408.

[170]John Anderson, The Struggle for the School (Nairobi: Layman Kenya Limited, 1970), 39.

providing conformity to already proven values and preparation to a productive role as a member of a small kinship group. On the contrary, the Western type of education (characterized by the logic of individuality of man, competition, monotheism, capitalism and representative democracy), was transferred into the Kenyan situation with the aim of producing ". . . a skilled class of workmen who would keep up the habit of daily work for a lifetime . . ."[171]

Such was the philosophy assigned to the education of the Kenyans. By all measurements, it only yielding a slender intellectual attainment. A major factor that dwafted this, socalled Western education hubbed around the instructional language. This was of particular concern to both the missionary and the colonial government. There existed the belief that Africans must be instructed in their vernacular languages.

The 1924 Phelps-Stroke commission exposed that educating in one's vernacular language helped preserve whatever was good in the native customs, ideas and ideals thereby preserving one's self respect.[172] The commission accentuate by stating:

> . . . all people have an inherent right to their own language . . . . and no greater injustice can be committed against a people

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[171]Sir Percy Girouard, "Report of the East African Protectorate," 1912, Special Collection, Kenya National Archives, Nairobi, 184.

[172]John Anderson, The Struggle for the School (Nairobi: Layman Kenya Limited, 1970), 184.

than to deprive them of their own language.[173]

In 1925, the East Africa Commission enunciated the importance of the vernacular when it elucidated that vernacular should be the mode of education during the first years of formal schooling.[174] That same year, the Committee on Native Education in tropical Africa emphasized the use of mother-tongue languages in school calling for the provision of textbooks in those languages.[175]

Instruction in native languages was not what the Kenyans would settle for. Universally, Africans were ready to receive what the colonists had. In 1924, the president of the Tanganyika Civil Servants Association stated:

> '. . . (P)eople can say what they like, but to the African mind, to imitate Europeans is civilization. I can not explain the reason why, but there it is. And I believe as far as my little knowledge of history goes, there is no colony in the British empire where they have convinced their subjects otherwise.'[176]

Similarly, Heynemann quotes the Zimbabwe political activist, Ndabaninge Sithole saying:

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[173]T. P. Gorman, "The Development of Language Policy in Kenya with Particular Reference to the Educational System," in Language in Kenya, ed. W. H. Whiteley (London: Oxford University Press, 1974), 408.

[174]Terrance Ranger, "African Attempt to Control Education in East and Central Africa, 1900-1939," Past and Present, 32 (n.d.): 69.

[175]Ibid. 69.

[176]John N. Muitungu, "Preparing the Pupil for the Use of English as the Medium of Instruction During the First Three Years of Primary Education," (unpublished manuscript, Nairobi: University of Nairobi, 1975), 4.

> 'To us, education meant reading books, writing and talking English and doing arithmetic . . . . at our homes we had done a lot of ploughing, planting, weeding and harvesting . . . we knew how to do these things. What we did not know, we wanted, as we said in Ndebele, "to learn the book until it remained in our heads, to speak English until we could speak it though our noses." '[177]

Policies on the inclusion of the English language in the curriculum was laid in 1929 by the Education Conference in Dar es Salaam and was later adopted by the Kenya Department of Education as follows:

> a) Vernacular will be used for the first four years of school life; b) Swahili will be introduced as a subject during this period; c) English may be taught in those classes where there are competent teachers; d) After the first four years, Swahili will be the medium of instruction; e) In those schools in which English has been taught, English may be used as the medium; f) After the completion of six years' study it will be introduced as soon as possible.[178]

Such a provision was contrary to various opinions as those of the infamous Major E. S. Grogan who could not "imagine a more desperate happening than we should introduce the language (English), to large numbers of people whose proper education is to work in the fields..."[179] Similar

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[177]Stephen P. Heynemann, The Conflict over what is to be Learned in Schools: A History of Curriculum Politics in Africa (Syracuse, New York: Syracuse University, 1971), 48.

[178]Stephen P. Heyneman, The Conflict Over What is to be Learned in Schools: A History of Curriculum Politics in Africa (Syracuse, New York: Syracuse University, 1971), 48.

[179]R. C. Pratt, "Administration and Politics in Uganda, in eds. Vincent Harlow and E. Chilver, History of East Africa (London: Oxford University Press, n.d.), 541.

opinions sought to discourage the spread of English among Kenyans recognizing that "for the educated East Africans, English is a political need."[180]

Until the 1940's, the general pattern of language used in the Kenyan schools was that after the initial stage, Swahili was used as the medium of instruction being interposed in some cases between a vernacular language and English. At the time of the issuance of the Ten Years Plan for the Development of African Education in 1948,

> . . . the language of instruction in primary schools was vernacular but for Standard 3 onward Swahili . . . (was) taught as the **lingua franca** of the colony and (was) . . . the medium of instruction in the Junior secondary schools . . .[181]

The English language was taught only as a subsidiary course. However, there were some schools that had capable teachers for the English course in Standard 6. Under the Plan, it was permissible to use English as the mode of instruction. Schools teaching English as a course had the choice of taking Kenya African Preliminary Examination (KAPE), in either English or Swahili.

The Beecher Report on African Education fortuitously declared that the transition from mother-tongue languages (i.e. other than Swahili), to English was something for which the syllabus must provide and which in any case can easily be

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[180]W. H. Whiteley, "Language and Politics in East Africa," Tanganyika Notes and Records, 47 (1957): 164.

[181]Protectorate of East Africa, The Ten-Year Plan for the Development of African Education (Nairobi: Government Printer, 1948), 4.

accomplished. This report had ruled out the possibility of introducing English during the first years of primary school education because of lack of teachers.

The subsequent report of the East African Royal Commission of 1953-55, however, recommended that the teaching of English should begin as low a class as possible and that it could become the medium of instruction as early as it could be followed by pupils. At the time English language course was still taught in the third year of education and became the medium of instruction in the sixth year.

In 1958, a pilot course using English as the medium of instruction from the first year of education was conducted. At the time, the project was considered to be revolutionary in nature running counter to established inquisitive opinions, in particular of the UNESCO authorities.[182]

Perren whose opinion would tend to support the use of English as a medium of instruction beginning at an early period, writes:

> on purely educational grounds, there are strong arguments for using English as soon as possible. If English is the only medium, then the incentive to learn English becomes greater, the transition to the full use of English becomes quicker, and general process in the higher classes (where English must be used), is likely to be faster. By using English as a medium at a low level, it becomes possible to teach a great deal of English through its use in other subjects . . . . the mental strain of learning a foreign language and using it with a limited vocabulary is less for young children than it is for

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[182]C. Ohangen, "English Medium Teaching in Kenya," Overseas Education, 34, no. 3 (October 1962): 4.

older ones.[183]

For reasons similar those held by Perren, The Kenya Education Commission of 1964 endorsed the view that English should be used as a medium of instruction from the first year of education.[184] The following year, the Ministry of Education persisted in its curriculum reform program and introduced the New Primary Approach (NPA). This innovative approach did not only validate the teaching of English at the early years but it also advanced a philosophy whose aim was:

> . . . to discard the old colonial approach of the child passively receiving information dictated by the teacher and to replace it with the modern methods of teaching in which a pupil learns by doing -- by participating in learning activities.[185]

While emphasizing that the introduction of English would not be detrimental to the achievement of vernacular literacy or the teaching of Swahili, the NPA report recommended that Swahili be introduced as course in Standard 4 and be continued into secondary school. Three factors have led to the displacement of Swahili as the medium of instruction. First is the government's policy that English should ultimately become the **lingua franca** of Kenya. Second, the increased demand for earlier teaching of English that has come

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[183]G. Perren, "Report on the Work of the Special Center to 1st. December 1957" [cyclostyled], Special Collections, Kenya National Archives, Nairobi, appendix 1, 1.

[184]S. H. Ominde, Kenya Education Commission Report, part 1 (Nairobi: Government Printer, 1964), 18.

[185]Ng'ang'a Njoroge, "An Outline of the Historical Development of Primary Education in Kenya, 1844-1970 (Ph.D. diss., Ohio State University, 1972), 154.

from parents. Third, it is obviously pedagogically unsatisfactory to have three successive media of instructions in any educational system.

In 1979, the Language Committee of the Primary Education project, explicated the general and specific objectives of teaching the English course in primary schools:

> At the end of the first three years, the child should be have acquired a sufficient command of vocabulary and language patterns to enable him to use English as a medium of learning in the upper primary so that having completed the primary course a child should have acquired a working knowledge of vocabulary and language patterns for use in his everyday life . . . . he will have acquired listening skills to enable him to listen, understand and react appropriately when required to communicate in English. ii) he will have acquired speaking skills to enable him to use correct pronunciation, stress and intonation, so that his speech is understood; iii) He will have acquired reading skills to enable him to (a) to read and understand instructions and information (b) to read widely for pleasure (c) he will have acquired writing skills, to enable him to express his ideas legibly and intelligently in written English.[186]

3. School Broadcasting

Kenya was the first British colonial territory to have a regular public wireless broadcasting service. In 1928, the British East Africa Broadcasting Service began broadcasting in the English language. Three years later, the Imperial and International Communications took over responsibility for Kenya broadcasting under a license that lasted 25 years.

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[186]Primary Education Project (Language Committee), Language Teaching and Use in Primary Schools [mimeographed], October 1979, Special Collection of the Kenya Institute of Education, Nairobi, 5.

In 1962, a grant from the Colonial Development and Welfare Funds was made for Kenya Broadcasting Corporation to enable school broadcasting. The intention of the grant was for the development of a school broadcasting aimed principally at primary and intermediate schools, with a few lessons for secondary schools and teacher training colleges.

A school broadcasting liaison group consisting of representatives of the Kenya Broadcasting Corporation, Ministry of Education, and Kenya National Union of Teachers (KNUT), was set up as a working committee to coordinate the arrangements, and plans for the setting up of a school broadcast advisory committee by the KBS. In 1963, the school broadcasting program came into existence and was headed by an education officer. Two years later, it was taken over by the Ministry of Education and attached to the Kenya Institute of Education. During that year, the broadcasting program saw a sharp increase in the number of listening schools, and broadcast time.

In addition, effort was given to the development of the broadcasting curriculum. This was met with success as evidenced by its performance in the internationally acclaimed educational contest in Japan.

In 1974, the Republic of Kenya realized the promise made by the ruling party in the expansion of educational opportunities that were previously restricted both economically and politically curing the colonial years. The first step toward this goal was taken at the 1974 abolition of

school fees for Standards 1 to 4. The effects produced an unparralled school enrolment beginning in that year, a phenomenon that totally changed the country's educational realm in several ways, including shortages of a qualified teaching personnel, teaching facilities and an anticipation of a large volume of literate youths in the ranks of unemployment. Before the turn of the decade, statistics released at the 36th Session of the International Bureau of Education, convened in Geneva in 1977, placed Kenya among the highest ten countries in the world in providing access to education to a majority of her people.[187]

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[187]Ministry of Education, "Kenya Education Ten in Geneva," Newsletter, 14 (July/August 1977): 2.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

A. INTRODUCTION

Kerlinger recommends a field experiment research design to social psychologists, sociologists and educators because it is "admirably suited to many of the social and educational problems of interest to ..."[1] them. Further, Isaac and Michael have characterized such a design in their: Handbook in Research and Evaluation, as being powerful in the allowance of the control of variance in order to:

1. Maximize the variance of the variable(s) associated with the research hypotheses;

2. Minimize the variance of extraneous or "unwanted" variables that might affect the experimental outcomes, but are not themselves the object of the study;

3. To minimize the error or random variance, including the so-called error of measurement.[2]

In addition, a field experiment research design has two other important advantages that need to be mentioned here: First it is suited to the testing of problems and providing insight into practical solutions. Second, it is flexible and applicable to a wide range of problems.

For these characteristics, the researcher chose the

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[1]Fred Kerlinger, Foundations of Behavioral Research, 2nd. ed. (New York: Holt, Rinehart and Winston, Inc., 1974), 338.

[2]Stephen Isaac and William B. Michael, Handbook in Research and Evaluation (San Diego, California: Edits Publishers, 1981), 24.

field experiment research design for the study of interaction instructional radio classrooms in Kenya's urban primary schools and their effects on cognitive achievement of pupils.

B. SUBJECTS

Subjects for this study were 808 boys and 780 girls (N = 1588), Standard III pupils from 14 schools (38 classrooms), urban primary schools. This sample was randomly selected from a possible population of 107 primary schools of the type A category in the City of Nairobi public school system. The subjects ranged in age from 8 to 10 years (X = 8.8). For the research the sample was divided into two groups according to the instructional methodologies used in the teaching of the English course lessons.

Of the 14 type A schools, 7 schools (17 classrooms with N = 721 pupils), were assigned to the experimental group. These being the schools with classrooms utilizing School Broadcasting facilities, a non-traditional method, utilizing radio in their instruction of the English course. During the course of instruction, the radio teacher provides a major section of instructional content with the immediate/present teacher serving at the capacity of an aide.

The remaining half, who are taught by an immediate/present human teacher, were assigned to the control group. This group, consisting of 7 schools (21 classrooms with N = 867), represented the traditional teaching methodology.

C. RESEARCH INSTRUMENTATION AND PROCEDURES

The hypotheses to be tested in this study called for three sets of instruments. Two to measure relevant aspects of cognitive development, and one to assess the interaction environment.

Measure of Cognitive Development

Two lexical instruments were developed with a focus on the reading readiness of the subjects in terms of visual and auditory discrimination. The first instrument was an 18 item spelling test (ST). The ST instrument included three major categories of words -- words with complex vowel nuclei; words with simple vowel nuclei; and with a consonant doubling.

The first procedure undertaken in the construction of the ST instrument was to isolate words used in Standard III reading materials. These included materials officially recommended by the Ministry of Education as being capable of affording a sufficient coverage of the syllabus material for primary schools English course (and specifically the English curriculum for Standard III).[3]

Additionally, the ST instrument utilized a number of course material currently being used or were used in the past in private non-parochial schools in the Nairobi urban setting.

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[3]Ministry of Education, "Standard Three English Course," Kenya Syllabus for Primary Schools (Nairobi: Government Printer, n.d.).

Nouns and verbs were listed as were simple compound verbs, (verbs plus particles also called phrasal verbs); irregular verbs, and verb-preposition collocations. From this extracted list, "test worthy" items were compiled in the initial form. The frequency occurrences were considered using The American Heritage English Word Frequency Book,[4] for a word frequency of 10 to 60 in a million. For this study, it was independently determined that this frequency was fairly moderate.

In the selection of test items, consideration was drawn on choosing words from subject domains which were arbitrarily considered to have direct appeal to pupils. This was in concordance with suggestions offered by Niles, Baldwin and Wood, namely: that pupils better comprehend and respond to materials on topics which are highly interesting to them and that they will read and respond to material more difficult than they could normally read if the subjects appeal to them.[5]

Further, Goodman's contextual hypothesis has concluded that children do not need to have words presented to them in isolation. In other terms, presenting words in context is all that is needed for children to acquire correct responses to them.[6] This particular supposition was brought into

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[4]John B. Carrol, Peter Davies, and Barry Richman, The American Heritage Word Frequency Book (Boston: Houghton Mifflin, 1971).

[5]O. S. Niles, R. S. Baldwin, and S. D. Wood, A Guidebook to Accompanying Reflections (Glenview, Illinois: Scott Foresman, 1984),

[6]Kenneth S. Goodman, "A Linguistic Study of Cues and Miscues in Reading," Elementary English, 42 (1965): 642-643.

consideration in both the construction, field-testing and actual research administration of the instrument.

Additionally, following the postulations provided by Harris, namely, that each item in a test should help separate the proficiency subjects from those who lack the tested skills or learning,[7] the "test-worthy" items were field-tested. Subsequently, Harris suggests that "items showing negative discrimination or low discrimination (much below .30), should either be revised or discarded."[8]

A battery of tests was administered to a sample of 83 Standard III pupils selected arbitrarily from category A type of schools in Nairobi which did not participate in the study. The scheme that was used to perform the item discrimination procedures followed the method set out by Harris:

(a) Separate the highest and lowest 25% of the scripts;
(b) For each item, subtract the number of lows who answer the item correctly from the number of highs who answer correctly;
(c) Divide the results of steps (b) by the number of subjects in each group to obtain the item discrimination.[9]

Items which discriminated successfully were compiled in a second battery and administered to a separate group of 42 Standard II pupils falling within the same category as above. Items which, again, discriminated successfully were then

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[7]David P. Harris, Testing English as a Second Language (New York: McGraw Hill, 1969), 105-106.

[8]David P. Harris, Testing English as a Second Language (New York: McGraw Hill, 1969), 106.

[9]Ibid., 106.

compiled in the battery of a final test.

The final battery retained 36 items which, over the two administrations, had discriminated above 0.35. The inclusion of such items is simple evidence that a significant proportion of the pupils tested had not mastered them. This 36 item corpus was divided in half through a random selection. The first half, embodying 18 items was administered as the ST test at pre-test. The ST instrument was, further, sub-divided into three sub-tests, namely: ST1, ST2, and ST3 with each section containing six items. The second half was administered at the conclusion of the treatment as the ST post-test. Like the pre-test ST instrument, the post-test was similarly sub-divided.

Caution was, however, taken in the construction of the ST instrument. Only words that were thought not to be unique to the subjects were selected. The words selection had to be not only those used in Standard III books but also those used in early Standard IV teaching materials and whose frequency block falls between 10 and 60 in a million. Based on the above criteria, the words in Appendix B (B.1, B.2, B.3, B.4, B.5, and B.6) were selected.

Instrument ST was administered as a pre-test and an achievement post-test at the completion of school term III (September-December). Both administrations of ST was approximately 12 minutes long and the following procedures were followed (see also directions provided in Appendix B):

1. Verbal presentation of the target word;

2. Target word used in a sentence and verbally presented.
3. Repetition of target word;
4. A 20 second pause for writing and correction was allowed.

This amount of time given for writing each test item averaged about 20 seconds in the pilot study. The length of these pauses were found to be very adequate to allow the subjects to write each word at a fairly slow pace.

Test two was a 90 item lexical test (LT), with 18 identical pairs these being the target items. One set of the pair was randomly distributed in a lexical form of 4 columns and 18 rows (see Appendix B.7 and B.8), on an 8.5 by 11 inches page. This was referred to as Lt(a).

The target word was printed on an 8 by 22 inches manila form with each letter occupying a space area of approximately 4 by 2 inches area. This instrument was developed by the researcher using a modification of the criteria used in the development of ST. This instrument was referred to as Lt(b).

During the construction of this instrument, 180 words were isolated from a corpus initially gathered and field-tested in the same scheme as ST. Half of them (90 words), were randomly selected among which 18 target words were designated. The first half was designated for the pre-Test instrument and the remaining 90 words were assigned to the post-test.

The task for the completion of LT required that each

pupil be supplied with one LT(a). The teacher positioned himself/herself in front of the class, or any other position best suited for the display of LT(b).

The administration of LT followed this sequence:

1. Alert the pupils
2. Display LT(b) with the appropriate target word for 2 to 3 seconds and remove it from pupils sight;
3. Allow the subjects approximately 20 seconds to complete the task of selecting and circling the target word in LT(a).

It is important that the administration of the ST and LT be elaborated here. Both instruments were administered by the classroom teachers following an explanation of instructions and procedures for their completion. In the administration of the LT instrument, each subject was supplied with a type-written single page answer sheet Lt(a)(see Appendix B.8 and B.10).

To avoid extraneous variables, the research assigned the classroom teachers with the responsibility of explain directions on tests' completion procedures then administered them. These two instruments (ST [1,2,3] and LT) were given as a pre-test and as an achievement measure at the completion the eleven-week Term III. Both instruments were administered on the same day.

Measure of the Interaction Environment

In addition, Flanders System of Interaction Analysis,[10] that allows an observer to categorize teacher-pupil verbal interaction, was used. The researcher's selection of this instrument was based on two facts. Firstly, Flanders' instrument was found to have potential in its ability to systematically classify all teacher classroom behaviors into 10 mutually exclusive and all-inclusive categories.

Any behavior occurring in the classroom can be categorized into only 1 of the 10 categories. These categories are as follows: Accepts feelings; praises or encourages; accepts or uses ideas of students; asks questions; lecturing; giving direction; criticizing or justifying authority; student talk-response; student talk-initiates; and silence or confusion (see Appendix C.1).

Secondly, Flanders system of analysis, using a matrix of generated variables, was found to be capable of going beyond an examination of frequencies of behavior. The system requires one to categorize verbal interactions occurring in the classroom every three seconds. As a result, one is able to determine the frequency with which particular verbal behaviors occur during a specific time interval.

This instrument was utilized by the researcher and two trained observers. These observers were recruited from the University of Nairobi and Daystar University College based on

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[10]Ned A. Flanders, "Teacher Influence, Pupil Attitude and Achievement," Cooperative Research Monogram (Ann Arbor, Michigan: University of Michigan, 1965), 2.

their interests and qualifications. The observers collected data independently. The collection of data required the observers to position themselves in locations where they were able to hear and see all interactions as they occured.

D. SCORING OF INSTRUMENTS ST AND LT

ST was scored according to a modification of a six point Spelling Strategy Rating Scale found by Zuttel.[11] The modified scale is contained in Appendix B.11, B.12, and B.13

Three independent raters rated each spelled item using the modified scale. The percentage of agreement between the raters during the initial field-testing exercise was between 87% and 100% when N = 42. Each subject's spelling rating for six items in a category were totalled, giving each an overall score for each of the three categories. Thus a pupil could obtain scores ranging from 0 to 30 for each of the categories and a maximum of 90 for the three ST tests.

The scoring of instrument LT was according to Tierman's criteria: "the essential fact in spelling is to write all the letters and have them in the right order . . ."[12] As such a circled word to be correct had to be exactly as that shown in LT(b).

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[11]Jerry Zuttel, "Spelling Strategy of Primary School Children and their Relationship to Piaget's Concept of Decentration," Research in the Teaching of English, 13, No. 1 (February 1979): 72.

[12]L. S. Tierman, "The Value of making Hard Spot in Spelling," University of Iowa Studies in Education 5, (May 15, 1930): 8.

E. TREATMENT

Subjects were exposed to the English language instruction following the **Kenya Syllabus for Primary Schools: Standard III English Course,** a publication of the Ministry of Education. The control condition was grouped according to their schools and respective classrooms and taught by their regular immediate/present teachers. At least two daily lessons, each 30 minutes in length were presented to yield an average total of 67 lessons by the end of the school term. This is in accordance with the requirements set forth by the Ministry of Education which direct that an average of 7 English course lessons be taught in any given week.[13]

The experimental group was grouped according to their respective schools and classrooms. Like the control group, they received an average of 7, 30 minutes lesson periods a week. The thirty-minute radio lessons allowed at least 7 minutes of supplementary teaching by their regular classroom teachers and 23 minutes of instruction through radio.

The lesson format included instructions on the various principles for letter/sound correspondence (eg. "W" is silent if the letter is followed by "R" and a vowel, and if the syllable ends or begins before the second consonant). Lessons included pronunciation by repetition and numerous

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[13]Ministry of Education, "English Course for Standard Three," Kenya Syllabus for Primary Schools (Nairobi: Government Printer, 1983),_____

opportunities for pupils to write on the blackboard.

The structural segment emphasized forms of words and the principles involved in the formation of compound words. These lessons gave the sample an opportunity to identify root form of the compounded words and constructing sentences. The third segment was composed of principles in the pronounciation of words whose construct had two or three consonant following each other.

F. OBSERVERS

According to Yoloye, effective observations, need to pay attention: to the relevant events and behavior; to make an objective record of behavior; to present the obtained record in a manner that will yield meaningful interpretation; and to interpret this data.[14]

The researcher recruited two observers and trained them on how to utilize the Flanders System of Interaction Analysis. The unobtrusive observers' task was to record a number every 3 seconds which indicated the particular behavior occurring during that time interval. The research observers aimed at collecting objective record of events or behavior as they occurred.

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[14]Ayotunde E. Yoloye, "Observational Technique," in Handbook of Curriculum Evaluation, ed. A. Lewy (New York: Longman Inc., 1977), 194.

G. VARIABLES

Independent Variable

In research, an independent variable is considered to be the antecedent condition which is manipulated by the researcher. This is the variable which is hypothesized to be the causal variables producing the presumed effect. For this study independent variables were selected as instruction: radio and non-radio instructional method for the Standard III English course.

Dependent Variable

The dependant variables have usually been defined as the behavioral variables designed to measure the effects of the variation of the independent variables.[15] Since the dependent variable is the presumed cause of the dependent behavior (presumed effects), it is the task of the dependent variable to determine whether the presumed cause did or did not produce an effect. Christensen emphasizes that if an effect is produced, the dependent variable must indicate if the presumed effect was actually facilitated or inhibited by the presumed variable and be able to reveal the magnitude of this effect.[16] Further, "if the dependent variable can accomplish these tasks, the experimenter has identified and used a good

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[15]Larry B. Christensen, Experimental Methodology, 2nd. ed. (Boston: Allyn and Bacon, Inc., 1980), 82.

[16]Ibid., 83.

sensitive dependent variable."[17] Having defined this concept, the dependent variable for this study were selected as the level of interaction, and cognitive achievement as measured by the ST and the LT instruments.

H. HYPOTHESES

In formulating an hypothesis, McGuigan has offered seven criteria that ought to be considered as relevant guidelines. These are summarized below:

* An hypothesis must be testable
* An hypothesis must be in harmony with other hypotheses in the field of investigation to increase the degree of probability;
* An hypotheses that is more parsimonious is far preferred to one;
* An hypothesis must be relevant to the problem addressed and not some other;
* An hypothesis must have logical unity and comprehension;
* An hypothesis must either be in a quatifiable form or be susceptible to a convenient quantification;
* An hypothesis, while being generated in scope, must have a large number of consequences to

[17] Ibid., 83.

be fruitful.[18]

Following McGuigan's guidelines, the following hypotheses were postulated:

Ho1: There will be no significant differences on teacher indirect influence between the the different instructional groups.

Ho2: There will be no significant difference in teacher direct influence between the different instructional groups.

Ho3 There will be no significant difference in question asking pattern between the different instructional groups;

Ho4: There will be no significant difference in the pupils' initiative level between the different instructional groups.

Ho5: There will be no significant difference in auditory discrimination abilities between the different instructional groups.

Ho6: There will be no significant difference in visual discrimination abilities between the different instructional groups.

I. DATA ANALYSIS

Data collected using all instruments were coded and

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[18]F. J. McGuigan, Experimental Psychology Methods Research 4th ed. (Englewood Cliffs, New Jersey: Prentice-Hall, 1983), 48-49.

computer analyzed in IVA[19] program to obtain frequencies from the Flanders instrument and SYSTAT[20] programs capable of running parametric and non-parametric procedures were used on an high speed micro-computer.

J. SOURCES OF DATA

The sources of information for this dissertation other than those collected in the field via interviews and various research instruments already presented in this chapter, consisted of both official and unofficial documents and publications. A large amount of information on statistical data was extracted from government publications as: Ministry of Education Annual Reports (various years), statistical abstracts of the United Nations Economic Commission for Africa (UNESCO), included: Statistical Yearbook 1972-1980; periodicals that are a publication of the Economist Intelligence Unit; various research works of the U.S Agency for International Development (AID), including **Radio Language Arts Project (Kenya)**, and **Radio Mathematics Projects (Nicaragua)**.

In addition, a number of dissertation works were

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[19]A statistical program mainly suited for frequencies (especially the Flanders System of Interaction Analysis), developed with copyrights by Dr. Todd Hoover, Loyola University of Chicago, Chicago, 1989.

[20]SYSTAT Version 4.0 (The System for Statistics for PC), is a statistical package currently utilized in micro-computers and parallels SPSS for the Mainframe. Version 4.0 is a 1988 edition. See Leland Wilkinson, SYSTAT:The System for Statistics (Evanston, Illinois: SYSTAT, Inc., 1989).

consulted. Included are: **Validity of Specific Educational Media Competencies of Nigerian Teachers: A Case Study of Bendel State**, P. U. Ogedengbe written for the School of Education, Boston University; **Problem Profiles in Educational Television Systems in Nigeria**, by P. S. Nedasa, University of Pittsburgh; and of most help in casting a historical background of Broadcasting in Eastern Africa, and Kenya in particular is a dissertation written by Carla Heath in 1986 titled: **Broadcasting in Kenya: Policy and Politics, 1928-1984**, for the University of Illinois at Urban-Champaign.

Other sources included a number of small scale researches found in the unofficial literature. Many of these were done in Nairobi through the Institute of Developmental Studies, Nairobi University. These documents are readily available in the file collection at the Institute of Developmental Studies at the University of Nairobi.

It should be noted here that a select collection of these documents are available in the Africana Library of Northwestern University, Evanston, Illinois, and the government collection filed at the Kenya National Achieves, Moi Avenue, Nairobi. Further, since literature on developing countries is limited, the collection of secondary information was limited to sources such as libraries of Africana Studies of the University of Nairobi; The Africana Library at Northwestern University, and the Lewis Tower and Cudahy Memorial Libraries of Loyola University of Chicago.

CHAPTER IV

RESULTS

This chapter presents the findings of the study on interaction and its effects on cognitive achievement. The hypotheses that were formulated for this study have been analyzed through a series of factorial analysis procedures. Each hypothesis will be assessed in light of the findings and reviewed as a whole. Some unanticipated incidental findings will be presented. Implications of these findings will be discussed in the next chapter. Further, the results are reported separately for each hypothesis of the study.

The descriptive statistics comprised in Appendix A, (A.1, A.2, A.3, A.4, A.5, A.6 and A.7), provided a preliminary perspective on the trend of the various measures employed in this study. These measures have also been included in appendix B and C (B.1, B.2, B.3, B.4, B.5, B.6, B.7, B.8, B.9, B.10, and C.1). An examination of the data presented in these summary tables reveal an inclusion of the mean scores and their standard deviation for all groups. It is from these data that the researcher derives the basis for the observations which follows. There is a noticeable incremental movement in the mean scores as measured with instruments LT and ST for all treatments. However, there is an unmistakable difference on the increment.

Descriptive statistics, however, cannot by themselves determine the relative importance or significance of the results as they apply to the objective measures. For that reason, a priori statistical analysis was run on the data. This was accompanied by an execution of several analysis of variance procedures utilizing the MGLH module from the Systat computer program.

Null Hypothesis One:

It was hypothesized that there will be no significant difference in teacher non-directive influence between the experimental and the control groups. Using the IVA program, frequencies of each of the categories in the Flanders system were tabulated.

A summary of the mean percentages, range, and their standard deviations are contained in Table 5.1. These data have been derived from the row data shown in A.6 in the Appendix A. In addition a non-directive ratio was also computed using IVA and the results are summarized in Table 5.2. A manual calculation of this ratio would require the following formula:

$$\text{Non-direct ratio} = \frac{(1 + 2 + 3 + 4)}{(1 + 2 + 3 + 4) + (5 - 7)}$$

For the purpose of providing more meaningful

investigation of the classroom interaction environment this study opted to utilize a calculation of ratios (Appendix A.7),

TABLE: 5.1

Summary of Frequencies of Interaction Categories
for Dependent Measure: Flanders System of Interaction Analysis

Category:	1	2	3	4	5	6	7	8	9	10
	EXPERIMENTAL GROUP N = 17									
Range: High	8.00	3.33	7.33	15.33	30.75	13.33	13.66	14.00	23.33	27.00
Low	1.66	1.33	2.00	8.66	21.33	7.33	2.00	1.00	1.00	1.00
(H-L)	6.34	2.00	5.33	6.67	9.42	6.00	9.66	13.00	22.33	26.00
Mean %	6.15	2.33	5.42	10.55	24.35	10.97	5.61	11.52	2.52	21.14
Mean S.D.	2.15	0.47	1.74	2.35	2.47	1.58	3.63	3.39	5.37	5.52
	CONTROL GROUP N = 21									
Range: High	4.00	3.00	3.00	5.66	52.00	8.66	12.66	9.33	3.00	31.66
Low	2.33	0.50	1.33	3.00	32.66	2.33	3.00	3.66	1.00	21.00
(H-L)	1.67	2.50	1.67	2.66	19.34	6.33	9.66	5.67	2.00	10.66
Mean %	3.25	1.51	1.79	4.35	42.25	6.00	6.70	6.59	1.64	25.48
Mean S.D.	0.51	0.64	0.49	0.86	5.16	1.86	2.73	2.43	0.63	3.55

1. Accepts Feelings; 2. Praises; 3. Uses Pupils' Ideas; 4. Questions;
5. Lectures; 6. Gives Directions; 7. Criticizes or Justifies Authority;
8. Pupils' Responds; 9. Pupils' Initiative; 10. Silence or Confusion.

on the broader interaction influences in Flanders classifications, namely: Teacher Talk and Pupil Talk. The Teacher Talk classification consists of two main interaction

influences. These being the directive and the non-directive. The acceptance and clarification of the pupils'

TABLE 5.2

A Summary of Ratio Units of Interaction

for Dependent Measure: Flanders System of Interaction Analysis

RATIO NAME	NON-DIRECTIVE	DIRECTIVE	QUESTION	INITIATION
	EXPERIMENTAL GROUP N = 17			
Range: High	40.00	77.00	51.66	94.33
Low	22.00	61.00	26.33	44.66
(H - L)	18.00	16.00	25.33	49.67
Mean Ratio	27.24	72.19	38.07	83.68
Mean S.D.	5.56	4.74	2.35	2.47
	CONTROL GROUP N = 21			
Range: High	37.66	94.00	49.00	86.66
Low	5.33	63.33	6.00	44.66
(H - L)	32.33	30.67	43.00	42.00
Mean Ratio	11.28	88.26	13.12	74.86
Mean S.D.	8.82	8.37	10.79	10.81

feelings; the act of praising and encouragement of pupils' action and behavior; the acceptance and use of ideas of pupils' and the engagement in question asking contracts; all fall directly under the non-directive influence. Under the direct influence classification are three categories: namely, the discourse covering the content area (lecturing); the in-house administration of guidance pertaining to the expected behavior of the pupils during the instructional transactions (giving directions); and the delivery of statements of pontification directed toward pupils with intend to cause conformity in their behavior (criticizing and justification of authority).

The pupil talk classification includes two transactions. The first is the "student talk-response" to the teacher. Within this category, the teacher solicits conversation from the pupils. The second constituent within the pupil talk classification is "student talk-initiation." In this category the pupil, on his own initiative engages a verbal contact. The pupil may enter such verbal contacts following an acknowledgement by the teacher of the pupil's raised hand.

The groups' mean ratios presented in Table 5.2 indicates an 11.28 mean ratio for the control group with a range of 5.33 to 37.66. The non-directive ratio group mean for the experimental group was 27.24 with a range of 22.0 to 40.0.

Table 5.3 presents a summary of a one-way ANOVA performed to compare the non-directive teacher influence between the two groups. The results of the one-way ANOVA

showed a significant different (d.f. 1, 36 $p < .01$), between the two groups, with the ratio more in favor of the experimental group. Based on this analysis, the null hypothesis predicting similarities was not confirmed.

TABLE 5.3

Summary of Analysis of Variance
for Ratio for Dependent Variable Called:
Non-Directive Teacher Influence

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	3276.028	1	3276.028	218.119	0.000
ERROR	540.701	36	15.019		

Null Hypothesis Two:

It was hypothesized that there will be no significant difference on teacher direct influence between the experimental group and the control group. This hypothesis was tested in an ANOVA procedure to determine the presence of any similarities or differences in teacher direct influence between the two groups. The directive ratio summarized in Table 5.2 were used in the procedure. A summary of the ANOVA product comparing the two groups has been presented in Table 5.4. The results indicate a significant difference ($p < .01$), in favor of the control group.

This finding shows that classrooms taught using the

traditional method elicit more teacher direct influence than do their counterpart. Based on this analysis, the null hypothesis predicted could not be confirmed. This, however, is predictable by virtue of the structure and organization of the classrooms.

TABLE 5.4

Summary of Analysis of Variance
for Ratios for Dependent Variable called:
Direct Teacher Influence

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	3252.167	1	3252.167	276.429	0.000
ERROR	423.538	36	11.765		

Null Hypothesis three:

The third null hypothesis predicted that there will be no significant difference in the question ratio pattern initiated by the teacher between the two treatment groups. A computer analysis utilizing the IVA program was performed to obtain the question ratio for the two groups. A manual calculation of this ratio would employ the following formula:

$$\text{Question Ratio} = \frac{\text{category 4} \times 100}{\text{category 4} + 5}$$

A further analysis was performed on the obtained ratio. Table 5.5 presents a summary of the results of the ANOIA which reveals that there was significant difference ($P < .01$). This finding indicates that the questioning pattern in instruction in the classrooms taught by way of the traditional method exceeds that in the radio instructional method. The test performed to compare the two groups failed to confirm the predicted null hypothesis on similarities. Again, this was an anticipated finding.

TABLE 5.5

Summary of Analysis of Variance
for Ratio for Dependent Variable Called:
Teacher Question

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	7102.178	1	7102.178	151.374	0.000
ERROR	1689.052	36	46.918		

Null hypothesis four:

The fourth null hypothesis predicted that the difference in pupil initiative patterns between the experimental and the control group would not be statistically significant. In general, a tabulation of the ratio of interaction frequencies on the ninth category in the Flanders system provided more comprehensive

information about the learner initiation patterns than do the percentages. This is due to the scantily distribution of the frequencies. The mean percentages are represent in the summary Table A.6 and the mean ratios are represented in the summary Table A.7 in the Appendices. These ratios were tabulated using the IVA program. A manual computation of the pupil initiation ratio requires the following formula:

$$\text{Initiation Ratio} = \frac{\text{category 9 X 100}}{\text{Sum of all pupil talk}}$$

It can be seen from the ratio table (Table 5.2), that the experimental group appears to have procured a higher ratio (83.68), than the control group whose mean ratio of 74.86 deviated by 10.81 from the sample's mean.

However, an ANOVA procedure was conducted on this data to determine if the obtained group means were actually statistically different. The results of the ANOVA shown in Table 5.6 yielded an F ratio of less than 0.1 which was found not to be significant (d.f.= 1, 36; p = 0.774). Based on these results it was thus concluded that the null hypothesis on similarities in the initiation pattern of the two groups could safely be rejected.

Although no hypothesis was drawn for individual categories within the Flander's system, the obtained percentages of the observed frequencies (reported in Table 5.1 and a more detailed depiction in A.6 in the appendices), indicate a contrast in data.

This data was examined using a series of ANOVAS and their result have been reported in Appendix D (Tables D.1 - D.10).

TABLE 5.6

Summary of Analysis of Variance
for Ratio for Dependent Variable Called:
Pupil Initiative

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	25.326	1	25.326	0.083	0.774
ERROR	10940.028	36	303.890		

Results for all non-direct teacher influence categories, separately, revealed a statistical significance of less than the .001 level. Among the categories in the direct teacher influence, the category labelled "giving direction," was the only one that did not indicated significant statistical differences. The rest of the categories reported significant differences of less than the .001 level. An examination of the descriptive statistics indicates a mean score of 10.97 for the experimental group and 6.00 for the control (Table 5.1).

Null hypothesis five

It was predicted that there will be no statistical significant differences in auditory discrimination between the experimental and the control group. Bock argues that because the mean gain scores for students within a particular class are

correlated by virtue of their having the same teacher or teaching method, the teacher or method should be the unit of analyses.[1] For all statistical analysis of all the experiments treating the auditory discrimination, the mean gain scores of each class constitutes the dependent observation.

Tables 5.7, 5.8, and 5.9 present descriptive statistics data intended to depict a summary of the range, mean scores and the mean standard deviation for the two treatment groups on the dependent measure called ST. Also, included in the appendices of this study are detailed descriptive statistics summarizing both the pre-tests and the post-tests mean scores with their respective standard deviations for each dependent sub-measure (ST1, ST2, and ST3). These data are contained in appendix A and labled A.1, A.2, and A.3.

Prior to the testing of the predicted null hypothesis, three separate ANOVA tests were computed on the obtained mean score of the pre-test for each of the three sub-measures. The primary intent of these ANOVA applications was to determine the pre-treatment differences residing between the subjects of the radio and the non-radio samples.

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[1]R. Darrel Bock, Multivariate Statistical Methods in Behavioral Research (New York: McGraw-Hill, 1975), 497.

TABLE 5.7

A Summary of Descriptive Statistics
for Dependent Sub-Measure: Simple Vowel Words (ST1)

	Males		Females	
	Pre-Test	Post-Test	Pre-Test	Post-Test
	EXPERIMENTAL GROUP			
Score Range: High	9.97	25.98	9.18	25.43
Low	6.51	18.42	6.30	19.29
(H-L)	3.46	7.56	2.88	5.96
Mean Score	7.51	23.35	7.64	22.41
Mean S.D.	4.03	3.58	4.04	4.07
	CONTROL GROUP			
Score Range: High	8.52	27.97	9.32	27.95
Low	5.96	21.23	6.12	20.68
(H-L)	2.56	6.74	3.20	7.27
Mean Score	7.39	25.26	7.44	25.43
Mean S.D.	3.94	3.77	3.65	4.34

TABLE 5.8

A Summary of Descriptive Statistics
for Dependent Sub-Measure Called: Complex Vowel Words (ST2)

	Males		Females	
	Pre-Test	Post-Test	Pre-Test	Post-Test
	EXPERIMENTAL GROUP			
Score Range: High	8.75	26.05	8.78	26.68
Low	6.00	18.46	6.37	17.34
(H-L)	2.75	7.59	2.41	9.34
Mean Score	6.87	24.18	7.37	24.35
Mean S.D.	3.69	3.66	4.34	4.67
	CONTROL GROUP			
Score Range: High	8.50	27.72	8.81	28.50
Low	4.33	16.49	5.10	24.55
(H-L)	4.17	11.23	3.71	3.95
Mean Score	6.90	25.80	6.77	27.00
Mean S.D.	3.93	4.38	4.28	4.43

TABLE 5.9

A Summary of Descriptive Statistics
for Dependent Sub-Measure Called: Consonant Doubling (ST3)

	Males		Females	
	Pre-Test	Post-Test	Pre-Test	Post-Test
	EXPERIMENTAL GROUP			
Score Range: High	8.26	25.89	8.88	26.84
Low	6.37	17.45	6.16	17.24
(H-L)	1.89	8.44	2.72	9.60
Mean Score	7.02	21.60	7.51	22.04
Mean S.D.	3.46	3.48	3.44	3.35
	CONTROL GROUP			
Score Range: High	8.30	26.87	8.67	26.92
Low	6.26	19.17	6.23	19.96
(H-L)	2.04	7.70	2.44	6.96
Mean Score	7.24	23.46	7.16	23.21
Mean S.D.	3.28	4.17	2.97	3.43

TABLE: 5.10

Summary of Analysis of Variance
for Mean Pre-test Scores for Dependent Measure:
Simple Vowel Words (ST1)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	0.058	1	0.058	0.147	0.703
GENDER	0.728	1	0.728	1.833	0.180
TREATMENT* GENDER	1.303	1	1.303	3.279	0.074
ERROR	28.615	72	0.397		

Whereas the control group performed better in all the three pre-test of the dependent measures, their obtained mean score was found not to be statistically significant at alpha .05. The yield on the ANOVA tests are presented in Tables 5.10, 5.11, and 5.12. Further, it was observed that the standard deviation yielded from the descriptive data for all measures were relatively low and narrow in range. The frequency distribution of the data was, however, not inspected.

TABLE: 5.11

Summary for Analysis of Variance
for Pre-Test Mean Scores for the Dependent Sub-Measure Called:
Complex Vowel Words (ST2)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	0.367	1	0.367	0.565	0.455
GENDER	0.468	1	0.468	0.720	0.399
TREATMENT* GENDER	0.234	1	0.234	0.360	0.550
ERROR	46.757	72	0.649		

TABLE 5.13

Summary of Analysis of Variance
for Pre-Test Mean Scores for Dependant Sub-Measure Called:
Consonant Doubling (ST)

SOURCES	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	1.266	1	1.266	1.436	0.235
GENDER	0.509	1	0.509	0.577	0.450
TREATMENT* GENDER	2.055	1	2.055	2.331	0.131
ERROR	63.475	72	0.882		

To test the prediction of the null hypothesis, three separate 2 X 2 (gender X treatment), ANOVAS were computed on three dependent sub-measures of the ST. Results for each dependent sub-measure are contained, respectively, in Tables 5.11, 5.12, and 5.14.

Dependent Measure called: Simple Vowel (ST1)

A 2 X 2 ANOVA was conducted with mean gain scores from the sub-measure called Simple Vowel as the dependent variable. A summary table depicting these gain scores is found in Table 5.13 and a more detailed summary for the individual classrooms is presented in A.5 in the Appendices. The calculated descriptive statistics (presented in Table 5.1), indicate a diversified mean difference among the two groups. These mean gain scores ranged from a low of 14.00 and a high of 21.53 for the control group and a low of 10.78 and a high of 19.23 for the experimental group.

The ANOVA procedure examined two main effects and their interaction (effect called treatment and effect called gender). Table 5.13 portrays the results of the ANOVA test. It was observed that treatment alone made a difference and not gender or their interaction ($p < .05$) for main effect called treatment, ($p > .05$) for the main effect called gender, and $p > .05$ for the interaction of the two main effects. The implication that could be drawn from these results indicate that the mean score increment in the classrooms using the traditional method was superior than that of the radio instructed classrooms.

TABLE 5.13

A Summary of Descriptive Statistics
for the Dependent Measures ST and LT

GROUP	DEPENDENT MEASURE	MEAN GAIN SCORES (M)	(F)		MEAN RANGE (M)	(F)	MEAN S.D. (M)	(F)
EXPERIMENTAL	ST-1	15.95	14.78	H	19.23	18.05	2.38	2.44
				L	10.78	11.10		
				H-L	8.45	6.95		
	ST-2	17.29	17.20	H	19.03	19.30	1.77	2.47
				L	11.60	10.66		
				H-L	7.43	8.64		
	ST-3	14.38	14.50	H	19.02	18.93	3.10	2.99
				L	10.44	9.95		
				H-L	8.58	8.98		
	LT	7.06	7.95	H	8.95	9.66	1.08	1.14
				L	5.56	6.10		
				H-L	3.39	3.56		
CONTROL	ST-1	17.86	17.99	H	21.53	20.72	1.98	1.90
				L	14.00	12.47		
				H-L	7.53	8.25		
	ST-2	18.85	20.23	H	23.39	22.70	2.77	1.56
				L	10.18	17.49		
				H-L	13.21	2.24		
	ST-3	16.39	16.09	H	20.55	19.14	2.33	1.81
				L	12 48	12.97		
				H-L	8.07	6.17		
	LT	7.42	7.58	H	9.55	9.66	1.01	1.15
				L	5.83	6.06		
				H-L	3.72	3.60		

TABLE 5.14

Summary of Analysis of Variance
for Mean Gain Scores for Dependent Sub-Measure:
Simple Vowel Words (ST1)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	123.040	1	123.040	26.280	0.000
GENDER	4.998	1	5.606	1.068	0.305
TREATMENT* GENDER	7.787	1	7.870	1.681	0.199
ERROR	337.009	72	4.682		

TABLE 5.15

Summary of Analysis of Variance
for Gain Scores on Dependent Sub-Measure:
Complex Vowel Words (ST1)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	98.139	1	98.139	20.169	0.000
GENDER	7.870	1	7.870	1.617	0.188
TREATMENT* GENDER	10.195	1	10.195	2.095	0.152
ERROR	350.348	72	4.866		

Dependent Measure Called: Complex Vowel (ST2)

A second 2 X 2 ANOVA was conducted using mean gain scores on the complex vowel sub-test. Descriptive statistics presented

in Table 5.8 indicate a range of between 16.49 and 27.72 for the control group and 18.46 to 26.05 for the experimental.

The results of the two-way analysis of variance presented in Table 5.14 indicated a significant dissimilarities in the main effect called treatment and none for the main effect of gender. Their interaction reveal no statistically significant differences.

Dependent Measure Called: Consonant Doubling (ST3)

The mean gain scores for the third and final objective measure designed to test the null hypothesis related to auditory discrimination are presented in Table 5.9. A 2 X 2 ANOIA, with treatment and gender as main effects and their interaction thereof was performed. The generated results are summarized in Table 5.16.

TABLE 5.16

Summary of Analysis of Variance
for Mean Gain Scores for Dependent Measure:
Consonants Doubling (ST)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	60.939	1	60.939	9.288	0.003
GENDER	0.144	1	0.144	0.022	0.883
TREATMENT* GENDER	0.810	1	0.810	0.123	0.726
ERROR	472.369	72	6.561		

An eye-ball examination of the descriptive statistics would show that all treatment groups have identical ranges of the mean gain scores and similarly narrow standard deviation. However, an execution of the ANOVA procedure would reveal a statistically significant difference between the groups' scores.

This difference occured only when the main effect called treatment was observed (d.f. 1,72; f= 9.288; $p < .05$). The ANOVA procedure also attempted to investigate if the interaction of the main effects produced the difference. The results showed no significant difference (d.f. 1,72; $f = 0.123$; $p > .05$).

Whereas the cognitive achievement of both groups improved profoundly after eleven weeks of instruction, a statistical analysis of the observed gain scores obtained from the research instrument ST forms a basis for rejecting the null hypothesis predicting similarity in auditory discrimination.

Null Hypothesis Six:

The sixth and final null hypothesis predicted that there will be no significant difference in the visual discrimination abilities between the two groups. To test this hypothesis a 2 X 2 ANOVA, with treatment and gender as independent variables and gain scores from research instrument LT as the dependent variables was performed. Yields of the dependent measure are present in Table 5.17 (See also A.4 for a detailed presentation for individual classrooms).

TABLE 5.17

A Summary of Descriptive Statistics
for Dependent Measure: Sight Words (LT)

	Males		Females	
	Pre-Test	Post-Test	Pre-Test	Post-Test
	EXPERIMENTAL GROUP			
Score Range: High	8.09	15.40	7.90	16.48
Low	5.95	11.94	4.45	12.31
(H-L)	2.14	3.46	3.45	4.17
Mean Score	6.65	13.71	6.43	14.38
Mean S.D.	3.18	3.87	4.11	3.76
	CONTROL GROUP			
Score Range: High	8.12	16.13	8.48	16.21
Low	5.67	11.69	6.00	12.86
(H-L)	2.45	4.44	2.48	3.35
Mean Score	6.56	13.99	6.81	14.40
Mean S.D.	2.83	4.08	3.73	3.99

Tables 5.18 and 5.19 presents a summary of two 2 X 2 ANOVA tests performed on the descriptive statistics. The purpose of the first test was to examine the obtained mean scores from the pre-test in order to find out how the groups compared on the dependent measures called: Sight Words (LT). The main effects, treatment and gender, and their interaction were observed.

Whereas significant difference was found in the main effect

called gender, no statistical difference was found in the main effect called treatment. Females in the experimental group out-performed their male members and females in both groups. Further female members in the control group out-performed members of the remaining cells.

The second ANOVA test whose result are presented in Table 5.19 was performed using the mean gain scores of instrument LT. The two main effects and their interaction was observed.

TABLE 5.18

Summary of Analysis of Variance
for Pre-Test Mean Scores for Dependent Measure Called:
Sight Words (LT)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	0.001	1	0.001	0.000	0.983
GENDER	5.202	1	5.202	4.091	0.047
TREATMENT* GENDER	2.519	1	2.519	1.982	0.164
ERROR	91.545	72	1.271		

An examination of the ANOVA test results indicates an absence of differences that are statistically significant between the groups in their mean gain scores when the main effects called treatment and gender or their interaction were examined (Table 5.19). Based on the yields obtained from the procedure, the evidence failed to reject the predicted null hypothesis on visual discrimination.

TABLE 5.19

Summary of Analysis of Variance
for Mean Gain Scores for Dependent Measure:
Sight Words (LT)

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	0.427	1	0.427	1.045	0.310
GENDER	0.005	1	0.005	0.012	0.913
TREATMENT* GENDER	1.023	1	1.023	2.500	0.118
ERROR	29.450	72	0.403		

This chapter examined the results of all the 2 X 2 ANOVAS performed on the data collected on both the achievement measure and the interaction enviroment as observed utilizing the Flanders categories. The next chapter will present a discussion observing the propensity of the two teaching-learning environments in the light of similar and/ or related studies.

and role of communication in the classroom. In dichotomizing communication, their work emphasizes the complexity of information facing teachers and students and the degree of skilled cooperation necessary to achieve an instructional objective.

Statistical procedures performed on the dependent variable obtained through the Flanders Interaction analysis system have indicated significant statistical dissimilarities of the two groups in all categories with the exception of that labeled giving direction and learner initiative. When similar procedures were applied to the ratios, significance was observed in three out of the four categories. And similarities were found in the initiation ratio. This finding did not confirm the expected possibility that students in radio classrooms are more often than not, passive participants in an instructional transaction.

The results of the present study partially confirms findings of a number some studies that increased interaction has beneficial effects on student learning. The present study reveal that the both the radio and the non-radio classrooms started at the same achievement level. The question that now prevails is: why did the mean gain scores of radio pupils remain inferior. The results suggest one possible explanation, the content of interaction may have a bearing on learning. A study by Mishler on the verbal exchanges between teachers and their first-grade pupils attempts to show that ". . . specific cognitive strategies and social values are

manifest in how a teacher talks with and responds to pupils."[2] Mishler's study notated the underlying difference in interaction between the cognitive strategies and the social values. The former concerned itself with how attention is focused, how information is searched, how the evaluation procedures are used, and how the structure of alternatives are presented.[3] The latter pertains to the orientation of language itself, the modes of authority and control employed by the teacher, and the relations stressed between the individual and the group.

The results of this study partially replicates those reported by Reiser and his associates[4] whose study of 23 middle class pre-schoolers have found out that when interaction is incorporated into a teaching learning transaction cognition is elevated. Reiser's subjects assigned to the experimental condition performed significantly better than those in the control condition.[5]

Various studies have indicated a comparative equivalence of radio to traditional methods of instruction could not be

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[2]Elliot Mishler, "Implications of Teacher Strategies for Language and Cognition: Observation in First-grade Classrooms," Functions of Language in the Classroom, eds., Cadzen, V. John and D. Hymes (New York: Teacher College Press, 1972), 269.

[3]Ibid., 269.

[4]R. A. Reiser, M. A. Tessmer, and P. C. Phelps, "Adult-child Interaction in Children's Learning from `Sesame Street,'" Educational Communication and Technology Journal, 32 (1984): 217ff.

[5]Ibid., 220.

confirmed by this study. The widely popularized results of the studies by Gunter and Theroux[6], on radio as an effective teaching tool appears to have been pivoted on designs that were, first, not experimental in a classroom setting; second, the content area measured was inordinately narrow (one minute spots); third the presentation of the content area was exorbitantly repeated (10-15 times a day for one year).

In addition, their Tabacundo Paradigm which purports to present a "participatory type communication"[7] Gunter and his associate have, certainly, failed to provide a credibly scientific measure for achievement. Conclusion drawn in respect to their third paradigm, like the Tabocundo Paradigm, are based on assumptions that fail to provide an adequate measure of the level of interest. Results drawn by Spain have also been used in propagating the unparralled effectiveness of radio instruction over the traditional methods in teaching Mathematics to a rural pupil population.[8]

The study on classroom interaction in Kenya's primary school markedly differs from Spain's in terms of the measured cognitive level from which the radio classrooms began.

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[6]Jonathan Guinter and James Theroux, "Open Broadcast Educational Radio: Three Paradigms," in Radio for Education and Development: Case Studies, eds. Peter L. Spain, Dean T. Jamison, and Emile G. McAnany, Staff Working Paper No. 266, Volume 1 (Washington, D.C.: World Bank, 1977), 338-360.

[7]Ibid., 339.

[8]Peter L. Spain, "The Mexican Radioprimaria Project," in Radio for Education and Development: Case Studies, Staff Working Paper no. 266, vol. 1, eds. Peter L. Spain, Dean T. Jamison, and Emile G, McAnany (Washington, D.C.: World Bank, 1977), 79-90.

Spain's radio sample began on a lower level calculated to be significantly different from the non-radio sample (beyond the .001 level). Although the mean score for the present study was lower for the radio sample on all measures, they were found not to be statistically different. Additionally, Spain's sample was not adequately controlled. It appears from his discussion that the instruction presented via radio was continuously contaminated. Further, the very circumstances given in the description of his sample setting commonsensically militates learning, thereby affecting achievement.[9]

Spain's data needs to be examined further to make sure that it was in fact radio effectiveness that contributed to increased learning. An aspect that bring troubling concern is the apparent contradiction between his data and the learning-teaching environment.

Spain himself writes:

> The transmission of the radio classes is not always prompt, sometimes as much as ten minutes late. This keeps the classroom teacher in uncertainty, and wastes time . . . Only 18 of the 44 school have audible and functioning radios . . . more than 1/2 of the radio schools were found to be not functioning.[10]

If the primary source of instruction is continuously being affected by such encumbrances, how is it that the group's achievement level sharply differed from that of their

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[9]Ibid., 89ff.

[10]Ibid., 89.

non-radio counterparts. Further, the composition of the group was heterogenous. Although the sample groups are from zones classified as "rural,"[11] Spain himself acknowledges that the non-radio schools are located in the vicinity of the city while the radio are rural. The non-radio live within the outskirts of the city while the radio sub-sample were, by all means, rural. To provide data from such groups limits the control an important social variable -- SES.

Further, some personality and attitudinal factors have been predicted, in other studies, to contribute to the subjects differential academic achievement. A comprehensive review of this trait attributed to success in second language learning has been presented by Strong.[12] Strong approaches his study from a sociological point of view from which his results concludes that talkativity and verbal responsiveness have a positive correlation with successful English language learning:

> Highly structured classrooms where few opportunities exist for communicative interaction will encourage academic language proficiency among the more attentive and self-motivated students, but will not foster development for natural communicative language among any of the children.[13]

Donoghue and Kunkel have implicated further that:

> Children learn a great deal of language from their

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[11]Ibid., 82.

[12]Michael Strong, "Social Styles and the Second Language Acquisition of Spanish Speaking Kindergartners," TESOL Quarterly, 17, no 2 (June 1983): 241-258.

[13]Ibid., 256-257.

> peer group. A child learns the subtle nuances of meaning of wards by trial and error, testing against other members of the group in actual communication. By encouraging inter-pupil communication as much as possible the teacher will increase each childs opportunity both to practice what has been taught and to learn important new items.[14]

The scanty pupil initiative (output), in both treatment groups (less than 2%), indicates their very inactive role which not only deprives them of a chance to put the English language into communicative use, but more seriously, it does affect the quality of input. This situation raises concern, especially for the studio teachers who have no way of knowing when and how to modify an input when pupils do not indicate the degree to which the input is understood.

Chaudron, for example, has noted that target language modifications enhances perception and comprehension.[15] Similar conclusions have been drawn by number of studies within the last two decades.[16]

In terms of efficiency, radio has limitations that makes

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[14]Mildred R. Donoghue and John F. Kunkel, Second Language in Primary Education (Boston: Newbury House Publishers, 1979), 128.

[15]Craig Chaundron, "Simplification of In-put: Topic Reinstatements and Their Effects on L2 Learners' Recognition and Recall," TESOL Quarterly, 17, no. 3 (1975): 438.

[16]Charles A. Ferguson, "Toward a Characterization of English Foreigner Talk," Anthropological Linguistics, 17, no. 1 (January 1975): 12; Michael H. Long, "Teacher Feedback on Learner Error: Mapping Cognition," in On TESOL '77, H. Douglas Brown, Carlos A. Yorio, and Ruth H. Crymes, eds. (Washington, D.C.: Tesol, 1977), 278-294; Richard L. Allwright, "Problems in the Study of Language Teacher's Treatment of Learner Error," in On TESOL '75, Marina K. Burt and Heidi C. Dulay, eds. (Washington, D.C.: Tesol, 1975), 69-109; Steven D. Krashen, Principles and Practices in Second Language Acquisition (Oxford: Pergamon Press, 1982), 120-122.

is unsuitable for the instruction of a spoken language. Instructional radio presents a learning-teaching environment whereby an absence of the visual channel exists.

The role of the visual channel in learning has been examined by a number of studies. A dissertation authored by Kelly[17] and submitted to the university of Lancaster analyzes the paralinguistic and extra-linguistic aspects of an academic lecture in the field of engineering concludes that such lectures are incomprehensible when only heard and not seen. Although it acknowledges that the verbal message still holds a paramount position in a teaching environment, Kelly's study emphasizes that the visual features are essential for meaningful communication. This component has been discussed at length in a detailed work of Goodman and Altwerger.[18]

Whereas the present study has failed to confirm five of the six predicted null hypotheses, it failed to reject the null hypotheses predicting no statistical difference, insofar, as the visual discrimination is concerned. A review of the descriptive statistics presented in Table 5.5 indicates an unmistakable difference between the pre-test scores and the post-test. This increment ranges erratically from 6 to 10

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[17]R.T. Kelly, "Monologue Discourse in Situ: An Analysis of Para-linguistics and Extra-linguistic Aspects of an Engineering Lecture" (M.A. Thesis, University of Lancaster, 1978).

[18]Yetta Goodman and Bess Altwerger, "Print Awareness in Pre-School Children: A Study of the Development of Literacy in Pre-School Children, Occasional Paper 4 (Tucson, Arizona: Program in Language and Literacy, Arizona Center for Research and Development, 1981).

points for both groups. While there exists a true increment between both measures for all groups, the differences were not statistically significant.

At least two explanation that may be offered to this phenomenon. The first one may be methodological. The construction of the research instrument LT called for the random selection of test items whose word frequency analysis has been determined by Carrol[19] to range between 10,000 and 60,000 in a million These high frequency test items may have yielded Goodman's environmental awareness.

Goodman investigated the print awareness of pre-literate children from native backgrounds as Arabic, Spanish and Indian (Navajo). Her study found that even children who were virtually non-speakers of English could read items such as Crest, Coca Cola, Mc Donald, Cheerios, Wonder Woman, Dracula, and Spiderman.[20] An earlier work by Goodman and her associate attributes this phenomenon to the fact that media has made these items salient to the subjects.[21] While media may not have contributed to the saliency of the test items to the

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[19]John B. Carrol, Peter Davies, and Barry Richman, The American Heritage Word Frequency Book, Boston: Houghton Mifflin, 1971.

[20]Yetta Goodman and Bess Altwerger, "Print Awareness in Pre-School Children: A Study of the Development of Literacy in Pre-School Children," Occasional Paper 4 (Tucson, Arizona: Program in Language and Literacy, Arizona Center for Research and Development, 1981), 1.

[21]Kenneth Goodman, Yetta Goodman, and Barbara Flores, Reading in Biligual Classroom: Literacy in Biliteracy (Roselyn, Virginia: National Clearing House for Biligual Education, 1979), 14.

Nairobi schools' subjects, they may have been too simple since most words in the corpus contained four letters.

The second valid explaination relates to any physical disabilities of the subjects. Although the researcher had endevoured to encounter vision limitations by providing a legible Lt(a) instrument no data was collected to analyze the pupils' basic decodation level as it regards distance. Furthermore, no medical data was collected to provide information on existance or absence of vision disabilities among the pupils or correction by means of fitting eye glassed.

Finally, this study reveals that student talk is minimal in Kenya Schools. Although the student talk component in the Flanders system registered statistically significant differences when the frequency scores for both treatment groups are compared, it should be observed that, on the overall, the percentages were extremely low.

Whereas the present research study has not made any attempts to confirm or refute Mishler's insights, it does, however, call for a further study on the viability of interaction in instructional radio classrooms and how they compare with the traditional classrooms. The obtained results for this study should in no way be used as an indicative weakness or inferiority of the "electronic classroom" models. However, this data should be used as an additional confirmation of previous research work including those done by

Cazden, John and Hymes[22] in which the writers argue educators to realize that communicative patterns differ markedly from culture to culture. Additionally, pupils learn the form and function of language that their families and community use. In African cultures, for example, submissiveness is an expected behavior. Youngsters remain silent in the present of their seniors and may respond only to direct questions but only when called upon.

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[22]C. Cadzen, V. John, and D. Hymes, Function of language in the Classroom (New York: Teacher College Press, 1972).

CHAPTER VI

SUMMARY AND CONCLUSION

Education in developing nations has been expanding rapidly at all levels. At the primary school level, especially, enrolment has been augmented by a number of factors that have included: governmental policies on universal primary education; social implications of the benefits of literacy; and, rapid population growth. Within the Republic of Kenya for example, primary school enrolment between 1961 and 1978, exceeded 400%.

Such school enrolment magnifications come with the most serious inadequacy that may impede the quality of education, and undoubtedly its product. The derivation of most of these ineptitudes are attributable to the economic resources of the various nations facing strain from the world-wide economic recession and the nature of the present international economic order.

The posterity of educational expansion today raises a number of broader questions that have implications for the general area of process of achieving an uncompromising cognitive skills. Faced with limited educational resources, some governments have sought to adopt alternative instructional modes to meet the demands of their citizens.

This study has attempted to provide an analytical inquiry into the effectiveness of instructional radio as a teaching method adopted by the Ministry of Education in the Republic of Kenya. It sought to contemplate the assumption that instruc-tional radio can be used with assurance to improve the teaching quality resulting to equal or superior cognitive achievements when compared to the conventional teaching methods.[1]

To provide a scientific account, the study was designed as a field experiment research in the East African setting within the Kenyan educational system. This afforded a randomly selected sample of 14 primary schools with a majority of them running three streams. Information provided by the Office of the City Education Officer (CEO), indicated that streaming is based on administrative components and not on pupils' abilities or curriculum tracking.

From the 14 primary schools was found a total of 38 standard three streams. Of these, 17 utilized instructional radio pro-grams produced by the Kenya's Ministry of Education through the Educational Media Service, a unit of the Kenya Institute of Education.

The study pre-meditated the selection of standard three for the study because it is at this grade level that the primary school curriculum expects an ardent teaching of the

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[1]Maurice Imhoof and Philip R. Christensen, eds., "Forward," Teaching English by Radio: Interactive Radio in Kenya (Washington, D.C.: Academy for Educational Development, 1986), ix.

English language within the lower primary school level. This expectation comes with the intends of establishing a background upon which the linguistic medium of instruction would pivot upon.

This study was embarked upon after drawing various assumptions. First, a method of teaching should be based upon fundamental principles. For example, a good method maximizes pupils' activity as it allows them to learn through their own active participation. Second, a method of teaching should produce pre-determined results. In teaching Kiswahili language, for example, the goal may be specified within defined perimeters to enable participating pupils to read Kiswahili literature fluently. If such then is the goal, the method should, therefore, elicit a design capable of provoking those results and not just the peripheral abilities such as speaking the language fluently.

A study of instructional methods can be broad and may involve numerous elements. In attempts to narrow the subject for the purpose of manageability and focus, six null hypotheses were predicted. Four related to the teaching-learning transactions (process) and two related to the teaching-learning outcomes (product).

This study acknowledges certain limitations. In any experiment designed to compare the effectiveness of programmed instruction with classroom teaching, it is important that the content covered by the pupils under the two instructional

methods is identical.[2] As has often been the case, far too many studies have compared the post-test scores of subjects who worked through a given programmed text with the post-test scores of subjects who learned the same material in the traditional way without acknowlegding certain pertinent limitations.

While instructional radio, as in the case of Kenya's primary schools, can be examined after it has been used, it is not usually possible to scrutinize classroom teaching. Similarly due to variance in teacher style, personality, experience, it cannot be established that the radio and the traditional classrooms covered the same material to the same depth.

This study, however, admits the existence of evidence suggesting that programmed instruction and traditional classroom teaching may emphasize different concepts and consequently the observable group differences would, at least in part, be a function of the post-test which reflects the emphasis of a given instructional method rather than the other. A study as this one or any other that is done within a school system complying with a nationally designed curriculum ought to be warned on the dangers of bias prompted by such outlined objectives enclosed in national curricula.

A second limitation in this study concerns the choice of dependent variables against which the instructional method

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[2]B. Cheris, "On Comparing Programming and other Teaching Methods," Journal of Medical Education, 39 (1978): 306.

were evaluated. Cheris claims that studies such as this one should include learning time as a post-test criteria.[3] Hartley has suggested that post-test should be given not only shortly after instruction but also at a later date to provide a measure of retention.[4] Evans believes that student attitudes should be included routinely as criteria in studies of programmed learning.[5] While all these suggestions are relevant, this study had resolved to examine the teaching-learning experience within the two instructional methods by limiting the dependent variables to teaching-learning transactions and achievement.

To preface the results of this study, several issues require consideration. First, when significant differences between the groups was noted, they were generally found between treatments (radio and non-radio), rather than between gender (males and females).

Second, the reader is cautioned that although significant differences among treatment groups emerged when verbal interaction was used as dependent measure, there were several instances that it was in favor of the experimental group (the non-verbal was never included).

For example, radio classrooms were found to use less

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[3]Ibid., 309.

[4]J. Hartley, "Research Report," New Education, 2 (1966): 30.

[5]J. L. Evans, Programming in Mathematics and Logic," in Teaching Machines and Programmed Learning II, R. Glaser, ed. (Washington, D.C.: National Education Association of U.S., n.d.), 392.

lecture but rather sought to use questions. It was, indeed found that radio classrooms used questions twice as much and responded twice as much as the traditional classrooms.

Further, the ratios on direct teacher influence were found to be significantly lower for the radio classroom than for the traditional. This indicates that the instructional radio method seeks to solicit more pupil participation.

Another obvious trend that was found to be sharply significant was the amount of time assigned to category 10. The duration of silence/ confusion was less for the experimental condition than it was for the control. It was concluded that radio-time, positively, influenced this particular category.

Lastly, the results only reflect an ideal condition where both groups functioned within a similar socio-economic environment (urban), a culture where electronics and media are a secondary and by all comparisons remains a infinitesimal aspect.

At the risk of over-simplification, it might be concluded that while media has proved to influence behavior, it however, falls short of influencing cognition when used as a mode of instruction to a similar extend as the traditional method.

Radio classrooms can never approximate the real world learning environment -- the traditional method classrooms. A teaching-learning environment can provide optimal cognitive output so long as the interaction focuses on communication and

comprehension and not merely teacher-centered question-answer transactions. When the teacher structures the lesson, gives instruction, explains lesson contents, and when the pupil responses meaningfully to the questions, makes requests, relate personal experiences, meaningful interaction is going on. As Tucker has noted, "as student can effectively acquire a second language when the task of learning the language becomes incidental to the task of communicating . . ."[6]

This study, does indeed, suggest a further examination of what is merging in the Third World nations as the "electronic classrooms." A variable that may be of interest in future research is the at-home language influence, including the transfer from both the native language (including Kiswahili), structures and patterns of use on pupils' academic performance. Although the prediction of interference has proven to be inadequate for explaining many phenomena in learning a second language, research in the last decade appears to demonstrate that transfer from first to second language does indeed occur.[7]

Finally, although little could be found in the literature discussing how language is acquired and the relationship between the first and the second language

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[6]G. Richard Tucker, "Can a Second Language be Taught?" in On TESOL '77, H. D. Brown, C.A. Yorio, and R. H. Crymes, eds (Washington, D.C.: Tesol, 1977), 25.

[7]Annette M. Zehler, "The Reflection of First Language - Derived Experience in Second Language Acquisition (Ph.D. Dissertation, University of Illinois, Urbana- Champaign, 1981), 1-2.

academic skills, many unanswered questions still remain in teaching the English language though radio. Some of these questions reflect unresolved issues in second language teaching, while others derive directly from the complex interplay of social, political, linguistic, economical and educational factors that influence the pupils' overall academic development within the developing countries.

Research is not likely to provide answers to some of these questions for a considerable period of time. Thus it is crucial for resource personnel within the ministry of education (KIE specifically included) to become their own researchers by systematically observing the effects of assessment and recycling decisions on program development over time. By sharing such observations with other professionals, a rostrum would be established upon which a coherent experimental basis for future decisions would be provided.

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APPENDIX A

A.1

Summary of Test Scores and Standard Deviation for Dependent Measure: Simple Vowel Word (ST1)

MALES				FEMALES			
PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.	PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.
EXPERIMENTAL GROUP N = 17							
6.58	(3.45)	25.22	(3.23)	8.21	(3.54)	25.43	(3.43)
7.27	(3.29)	25.58	(3.43)	6.42	(4.76)	21.78	(3.56)
8.68	(2.46)	23.34	(4.34)	8.19	(3.54)	19.29	(3.98)
6.75	(4.63)	25.98	(5.54)	6.30	(3.65)	22.38	(3.44)
7.44	(2.68)	24.28	(3.23)	7.32	(4.65)	23.31	(5.49)
6.93	(4.73)	25.67	(2.98)	6.69	(2.68)	24.74	(3.77)
7.09	(5.29)	24.19	(4.34)	9.18	(4.35)	20.32	(4.13)
6.78	(4.65)	19.23	(2.76)	8.77	(3.65)	21.39	(2.43)
7.39	(3.67)	24.74	(4.65)	7.37	(4.65)	24.99	(4.30)
7.75	(3.64)	21.85	(3.98)	8.11	(5.40)	22.41	(3.98)
7.64	(5.39)	18.42	(2.43)	6.99	(5.85)	24.74	(5.49)
7.75	(3.43)	23.31	(3.45)	8.76	(3.67)	21.23	(4.39)
6.51	(2.65)	19.29	(4.35)	7.72	(4.65)	25.18	(6.49)
7.23	(3.65)	23.21	(3.42)	6.32	(4.35)	19.32	(4.39)
7.42	(4.53)	24.41	(2.98)	8.25	(2.43)	19.87	(3.43)
7.97	(3.48)	23.35	(4.65)	8.33	(3.54)	22.36	(3.29)
7.32	(3.34)	23.59	(4.33)	7.84	(3.52)	23.42	(3.22)
CONTROL GROUP N = 21							
7.23	(3.42)	25.25	(3.54)	7.87	(3.28)	27.12	(4.98)
7.32	(3.69)	21.32	(5.32)	8.21	(2.82)	20.68	(5.18)
6.32	(4.37)	23.15	(3.43)	7.32	(3.49)	26.96	(3.98)
8.02	(4.54)	27.49	(4.38)	7.54	(2.76)	24.86	(6.08)
6.95	(4.34)	26.95	(3.29)	7.21	(4.39)	23.43	(2.54)
7.31	(3.54)	24.85	(4.39)	8.54	(2.43)	24.78	(6.58)
7.36	(4.35)	26.74	(3.87)	7.32	(5.38)	26.56	(3.43)
7.98	(3.54)	22.69	(4.01)	6.97	(3.54)	26.34	(4.37)
5.96	(3.78)	23.75	(2.98)	7.34	(2.43)	25.65	(3.29)
8.48	(4.22)	27.56	(3.43)	7.32	(3.54)	23.87	(3.57)
8.52	(4.56)	26.82	(4.39)	9.32	(3.29)	26.85	(4.23)
6.96	(3.42)	21.23	(3.76)	7.98	(3.54)	25.32	(2.43)
7.32	(3.54)	26.84	(3.43)	6.12	(3.65)	25.42	(5.48)
6.89	(3.76)	25.65	(3.78)	6.98	(4.39)	26.39	(3.98)
8.23	(5.34)	26.65	(3.54)	7.32	(5.46)	23.64	(4.17)
7.42	(3.23)	22.23	(2.65)	6.34	(2.37)	22.87	(3.19)
8.21	(3.54)	26.76	(3.43)	7.42	(3.29)	26.87	(5.48)
6.44	(4.34)	27.97	(3.45)	7.36	(4.87)	26.96	(6.49)
7.01	(3.43)	25.89	(4.56)	8.42	(4.32)	25.76	(4.38)
8.15	(4.34)	25.67	(3.45)	7.23	(2.99)	27.95	(5.99)
7.21	(3.48)	24.94	(4.21)	6.13	(4.38)	25.85	(2.32)

A.2

Summary of Test Scores and Standard Deviation for Depedent Measure: Complex Vowel Words (ST 2)

MALES				FEMALES			
PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.	PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.
EXPERIMENTAL GROUP N = 17							
6.90	(3.64)	24.50	(3.42)	8.26	(3.65)	26.13	(2.64)
6.20	(2.57)	25.23	(2.58)	7.78	(3.43)	25.68	(5.46)
6.72	(3.23)	22.55	(5.29)	7.21	(4.64)	23.00	(3.95)
6.05	(3.23)	22.55	(3.42)	6.43	(3.24)	25.40	(4.32)
6.36	(4.36)	24.84	(4.39)	8.78	(5.47)	26.68	(4.65)
6.52	(3.43)	24.42	(3.26)	7.13	(3.54)	25.67	(2.08)
7.65	(3.12)	24.95	(3.53)	7.65	(4.34)	24.10	(5.49)
6.78	(4.23)	24.68	(2.87)	7.43	(5.54)	26.11	(6.65)
7.94	(2.98)	25.84	(4.86)	8.38	(3.08)	26.11	(5.64)
6.13	(2.73)	24.61	(2.32)	7.70	(4.38)	26.23	(5.46)
6.86	(4.64)	18.46	(4.34)	6.37	(3.43)	24.19	(4.35)
6.00	(2.31)	24.60	(2.38)	7.13	(4.96)	25.21	(4.39)
8.75	(3.67)	24.53	(3.28)	7.89	(3.65)	19.39	(5.45)
7.40	(2.59)	23.95	(3.64)	6.94	(4.65)	24.72	(4.35)
6.33	(4.39)	25.32	(4.53)	7.23	(5.86)	26.53	(5.87)
8.15	(2.93)	26.05	(4.12)	6.42	(4.38)	25.48	(6.39)
6.26	(3.64)	24.00	(3.98)	6.68	(5.46)	17.34	(7.32)
CONTROL GROUP N = 21							
6.67	(3.85)	23.01	(4.32)	8.53	(4.35)	27.52	(4.64)
7.67	(3.95)	24.12	(5.88)	6.13	(3.54)	28.50	(5.34)
8.17	(4.64)	26.86	(4.87)	6.00	(4.35)	26.65	(4.37)
6.31	(2.67)	16.49	(3.68)	6.62	(6.54)	27.56	(3.42)
8.50	(3.54)	24.58	(3.76)	7.31	(5.46)	27.58	(4.39)
7.00	(5.03)	25.63	(4.32)	7.83	(5.32)	26.73	(4.98)
6.45	(3.98)	27.24	(3.59)	6.43	(3.43)	27.31	(3.42)
4.33	(4.56)	27.58	(3.76)	5.23	(3.76)	27.93	(4.84)
8.05	(3.43)	26.89	(3.23)	8.38	(4.34)	26.23	(3.86)
8.46	(3.98)	27.72	(4.54)	6.31	(3.65)	27.15	(3.53)
6.76	(4.75)	26.52	(4.76)	5.10	(5.46)	27.73	(6.45)
6.53	(3.97)	27.59	(3.64)	7.06	(5.24)	24.55	(4.38)
6.76	(2.54)	24.67	(5.74)	6.41	(3.65)	27.53	(2.47)
6.46	(4.23)	27.18	(3.42)	6.32	(2.86)	26.51	(7.45)
8.43	(2.65)	26.16	(4.33)	5.46	(3.24)	27.68	(3.54)
5.21	(4.76)	27.15	(3.56)	6.28	(4.65)	26.67	(4.35)
6.67	(4.23)	27.72	(4.97)	7.26	(4.54)	26.16	(4.65)
6.52	(3.54)	26.93	(3.54)	6.53	(3.26)	26.93	(5.34)
7.42	(4.32)	26.65	(3.54)	8.05	(3.29)	26.89	(3.54)
7.36	(4.35)	24.43	(5.34)	8.81	(5.52)	26.63	(3.76)
6.17	(4.56)	26.51	(4.32)	6.32	(3.54)	26.79	(4.45)

A.3

Summary of Test Scores and Standard Deviation
for Dependent Measure: Consonant Doubling (ST3)

MALES				FEMALES			
PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.	PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.
EXPERIMENTAL GROUP N = 17							
6.43	(3.14)	24.66	(2.93)	8.38	(2.62)	26.34	(2.95)
6.37	(3.21)	24.67	(3.25)	7.32	(2.85)	21.43	(2.87)
7.63	(4.50)	20.46	(3.64)	8.24	(2.61)	18.19	(3.22)
6.87	(3.20)	25.89	(2.71)	7.42	(2.68)	25.79	(3.25)
7.26	(3.94)	21.02	(4.46)	6.84	(2.32)	22.49	(2.77)
6.82	(2.39)	24.93	(3.24)	6.73	(3.61)	25.66	(2.74)
6.76	(3.21)	19.39	(3.43)	7.07	(3.99)	18.45	(4.63)
6.61	(4.03)	18.46	(3.48)	8.67	(2.38)	21.40	(3.57)
7.14	(3.15)	25.68	(3.57)	6.94	(3.03)	25.44	(3.42)
6.94	(2.78)	17.45	(3.98)	7.68	(3.19)	21.39	(2.95)
7.60	(3.43)	18.04	(3.42)	7.49	(3.63)	19.36	(4.26)
6.89	(2.68)	19.06	(3.01)	8.86	(2.33)	20.46	(4.43)
6.73	(3.95)	18.23	(3.21)	7.84	(3.23)	26.36	(3.75)
6.86	(2.79)	22.97	(4.00)	6.34	(4.43)	20.49	(2.32)
7.32	(4.34)	23.30	(2.67)	6.16	(3.41)	17.24	(3.75)
6.89	(3.87)	18.49	(4.29)	7.52	(3.26)	21.46	(3.80)
8.26(	(4.22)	20.53	(4.01)	7.69	(2.98)	22.43	(2.34)
CONTROL GROUP N = 21							
6.74	(2.27)	26.19	(2.66)	8.20	(2.76)	26.92	(3.45)
6.94	(3.25)	21.62	(2.75)	7.54	(3.24)	21.27	(4.36)
6.43	(3.41)	24.84	(3.24)	6.69	(3.47)	20.43	(2.78)
7.96	(2.46)	21.46	(2.47)	7.62	(2.86)	24.32	(2.96)
7.24	(2.67)	25.79	(2.67)	6.86	(3.32)	21.44	(2.47)
7.42	(3.61)	23.46	(3.08)	8.12	(3.49)	23.94	(2.49)
6.69	(3.21)	19.17	(2.35)	6.54	(2.47)	22.45	(3.96)
8.30	(2.93)	22.46	(3.99)	6.79	(2.99)	23.49	(4.37)
6.26	(3.25)	22.43	(2.70)	6.73	(3.28)	21.46	(3.89)
8.05	(3.64)	26.45	(4.34)	7.26	(2.95)	22.98	(4.63)
6.94	(2.71)	22.38	(2.79)	8.67	(2.47)	23.34	(2.93)
7.46	(4.46)	21.43	(3.13)	7.69	(2.76)	23.35	(3.62)
6.89	(3.24)	26.22	(3.21)	6.38	(2.68)	25.16	(2.62)
7.23	(3.42)	23.03	(2.79)	7.44	(3.47)	26.38	(2.35)
7.56	(3.48)	23.86	(3.62)	6.23	(2.76)	22.42	(4.45)
7.33	(3.57)	20.95	(3.42)	6.99	(2.32)	19.96	(4.10)
8.02	(3.57)	24.47	(2.91)	7.00	(2.86)	22.49	(2.15)
6.32	(3.98)	26.87	(2.46)	7.03	(3.17)	22.49	(3.63)
6.92	(3.42)	21.43	(2.74)	7.50	(2.36)	26.64	(3.28)
7.92	(4.01)	26.76	(2.94)	6.53	(3.65)	22.63	(3.45)
7.33	(2.50)	21.46	(2.74)	6.46	(3.46)	24.82	(3.64)

A.4

Summary of Test Scores and Standard Deviation
for Dependent Measure: Sight Words (LT)

MALES				FEMALES			
PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.	PRE-TEST	MEAN S.D.	POST-TEST	MEAN S.D.
EXPERIMENTAL GROUP N = 17							
5.55	(2.89)	14.15	(3.51)	5.95	(4.64)	14.15	(4.28)
6.35	(4.12)	15.25	(2.90)	6.00	(3.54)	14.15	(5.29)
6.70	(3.05)	14.90	(2.55)	6.45	(3.66)	15.41	(4.65)
7.OO	(3.67)	13.14	(2.62)	6.60	(4.26)	14.81	(3.43)
6.45	(4.01)	15.40	(3.02)	6.35	(4.35)	14.51	(4.38)
6.38	(2.69)	14.47	(2.28)	7.90	(4.28)	14.04	(3.42)
6.47	(2.68)	12.57	(4.33)	6.47	(3.53)	12.57	(5.29)
8.09	(4.04)	14.23	(4.65)	6.84	(4.36)	15.68	(2.32)
5.95	(2.89)	13.55	(4.29)	6.26	(3.95)	15.52	(2.45)
6.76	(2.71)	12.84	(3.54)	6.38	(4.38)	13.48	(3.43)
6.38	(2.46)	11.94	(4.35)	6.32	(2.43)	15.52	(3.54)
6.54	(2.64)	13.48	(5.38)	6.82	(4.87)	16.48	(4.10)
6.14	(2.43)	12.67	(3.76)	6.43	(4.36)	13.41	(3.64)
6.45	(2.74)	12.90	(3.43)	6.14	(5.12)	12.31	(3.57)
6.10	(2.43)	14.25	(4.39)	7.34	(4.91)	15.41	(3.54)
7.33	(3.99)	13.47	(4.53)	4.45	(2.87)	13.21	(3.98)
7.42	(4.63)	13.90	(6.38)	6.67	(4.39)	13.93	(2.56)
CONTROL GROUP N = 21							
7.30	(2.22)	16.13	(4.98)	7.31	(3.25)	14.67	(5.39)
7.46	(2.69)	13.44	(4.39)	6.14	(4.64)	13.10	(3.31)
6.10	(2.77)	12.33	(4.75)	6.37	(2.43)	15.22	(3.76)
6.14	(3.14)	12.46	(5.35)	7.20	(3.28)	13.94	(4.19)
6.73	(2.61)	13.61	(4.23)	6.00	(4.54)	14.37	(4.27)
8.12	(2.34)	14.07	(4.65)	6.73	(4.65)	14.30	(3.43)
5.93	(4.00)	14.76	(2.68)	6.34	(3.43)	12.86	(4.39)
6.14	(3.11)	12.58	(5.32)	7.01	(2.43)	15.02	(4.35)
5.86	(2.14)	11.69	(3,42)	6.44	(3.47)	13.49	(3.65)
6.31	(2.63)	13.21	(3.54)	8.17	(3.98)	14.23	(3.43)
7.61	(4.11)	14.00	(5.65)	6.67	(4.38)	13.41	(4.29)
6.23	(3.34)	12.48	(3.43)	7.48	(3.24)	14.37	(4.76)
6.45	(2.67)	15.70	(4.97)	6.21	(3.76)	14.23	(4.23)
6.85	(2.46)	15.53	(3.87)	6.73	(2.32)	15.24	(4.20)
6.74	(2.33)	14.51	(4.10)	7.10	(3.43)	13.37	(3.65)
6.71	(2.75)	13.10	(3.43)	6.14	(4.23)	12.99	(3.98)
6.60	(2.37)	15.45	(3.54)	6.23	(5.46)	13.76	(2,76)
6.51	(4.15)	15.55	(4.24)	6.76	(3.26)	16.21	(3.56)
6.34	(2.15)	14.13	(3.24)	6.23	(4.32)	15.78	(4.90)
6.13	(2.43)	14.63	(3.54)	7.43	(4.35)	16.17	(2.43)
5.67	(3.06)	14.44	(2.43)	8.48	(3.56)	15.67	(5.98)

A.5

Summary of Gain Scores For Dependent Measure ST1, ST2, ST3 & LT

SIGHT WORDS (LT)		SIMPLE VOWELS (ST1)		COMPLEX VOWELS (ST2)		CONSONANTS ST3)	
M	F	M	F	M	F	M	F
		EXPERIMENTAL GROUP N = 17					
7.60	8.20	18.64	17.22	17.60	17.87	18.23	17.96
8.90	8.15	18.31	15.36	19.03	17.90	18.30	14.11
8.20	9.96	14.66	11.10	15.83	15.79	12.83	9.95
6.14	8.21	19.23	16.08	16.50	18.97	19.02	18.37
8.95	8.16	16.84	15.99	18.48	17.90	13.76	15.65
8.09	6.14	18.74	18.05	17.90	18.54	18.11	18.93
6.10	6.10	17.10	11.14	17.30	16.45	12.63	11.38
6.14	8.84	12.45	12.62	17.90	18.68	11.85	12.73
7.60	9.26	17.35	17.62	17.90	17.73	18.54	18.50
6.08	7.10	14.10	14.30	18.48	18.53	10.51	13.11
5.56	9.20	10.78	17.75	11.60	17.82	10.44	11.87
6.94	9.66	15.56	12.47	18.60	18.08	12.17	11.60
6.53	6.98	12.78	17.46	15.78	11.50	11.50	18.52
6.45	6.17	15.98	13.00	16.55	17.78	16.11	14.50
8.15	8.07	16.99	11.62	18.99	19.30	15.98	11.05
6.14	8.76	15.38	14.03	17.90	19.06	11.60	13.94
6.48	7.26	16.27	15.58	17.74	10.66	12.27	14.74
		CONTROL GROUP N = 21					
8.83	7.36	18.02	19.25	16.34	18.99	19.45	18.72
5.98	6.96	14.00	12.47	16.45	22.37	14.68	13.73
6.23	8.85	16.83	19.64	18.69	20.65	18.41	13.74
6.32	6.74	19.47	17.32	10.18	20.94	13.50	16.70
6.88	8.37	20.00	16.22	16.08	20.27	18.55	14.58
5.95	7.57	17.54	16.24	18.63	18.90	16.04	15.82
8.83	6.52	19.38	19.24	21.13	20.88	12.48	15.91
6.44	8.01	14.71	19.37	23.39	22.70	14.16	16.70
5.83	7.05	17.79	18.31	18.84	17.85	16.17	14.73
6.90	6.06	19.08	16.55	19.13	20.84	18.40	15.72
6.39	6.74	18.30	17.53	19.76	22.63	15.44	14.67
6.25	6.89	14.27	17.34	21.06	17.49	13.97	15.63
9.25	8.02	19.52	19.30	17.91	21.12	19.33	18.78
8.68	8.51	18.76	19.41	20.69	20.19	15.80	18.94
7.77	6.27	18.42	16.32	17.76	22.22	16.30	16.19
6.39	6.85	14.81	16.53	21.94	20.39	13.62	12.97
8.85	7.53	18.55	19.45	21.05	18.90	16.45	15.49
9.04	9.45	21.53	19.60	20.13	20.40	20.55	15.46
7.79	9.55	18.88	17.34	19.23	18.84	14.51	19.14
8.50	8.74	17.52	20.72	17.07	17.82	18.84	16.09
8.77	7.19	17.73	19.72	20.34	20.47	14.13	18.36

A.6

Summary of Ratio Units of Interactions for Dependent Measure: Flander System of Interaction Analysis

NON-DIRECTIVE	DIRECTIVE	QUESTION	INITIATION
	EXPERIMENTAL GROUP N= 17		
8.66	90.33	7.66	82.00
11.00	88.00	20.66	82.00
37.33	63.66	36.66	54.33
10.33	88.66	19.00	68.67
37.33	63.66	36.66	54.33
37.66	63.33	49.00	44.66
9.00	90.66	41.66	80.00
9.00	90.66	7.66	80.00
7.00	93.00	7.00	83.00
9.00	90.50	10.25	85.50
9.00	90.66	10.33	86.66
8.66	90.66	14.00	69.66
5.33	94.00	12.33	69.66
7.00	92.33	11.66	64.00
7.00	92.00	8.33	76.66
7.33	91.66	8.33	78.33
9.00	90.00	6.00	71.00
	CONTROL GROUP N = 1		
8.66	90.33	7.66	82.00
10.33	88.66	7.33	84.00
10.00	89.00	6.66	78.33
8.66	93.33	6.66	67.33
37.66	63.33	79.00	44.66
40.00	61.00	61.43	51.33
36.33	64.66	50.00	57.66
40.00	61.00	48.00	51.33
11.00	88.00	20.66	82.00
91.50	69.00	39.00	62.00
24.66	74.33	31.00	88.66
22.66	76.33	30.66	89.00
22.00	77.00	29.00	93.00
23.00	76.00	27.33	92.33
24.00	75.00	26.33	93.00
26.66	72.33	34.00	94.33
25.66	73.33	32.33	94.00
25.00	74.00	31.66	94.00
24.00	75.00	32.00	93.33
25.33	73.66	43.00	94.00
25.66	73.33	48.33	93.66
24.66	74.33	51.66	94.33

A.7

Summary of Percentage Frequencies of Interaction Categories for Dependent Measure: Flanders System of Interaction Analysis

TEACHER TALK							PUPIL TALK		
NON-DIRECT INFLUENCE				DIRECT INFLUENCE					
1	2	3	4	5	6	7	8	9	10
EXPERIMENTAL GROUP N = 17									
2.66	1.66	1.66	3.66	38.33	7.00	6.33	6.00	1.00	31.66
3.66	2.33	1.66	5.66	36.00	10.00	9.00	9.00	2.00	21.00
3.33	1.00	2.66	13.66	32.66	8.00	9.33	6.66	1.33	25.33
2.33	3.00	1.33	4.66	32.66	7.33	12.66	6.66	3.00	26.00
3.33	1.00	2.66	13.66	32.66	8.00	9.33	6.66	1.33	25.33
2.00	2.33	2.00	15.00	24.66	9.00	11.00	7.66	2.33	27.00
3.66	1.33	2.00	4.66	42.66	4.66	6.66	6.33	1.33	27.00
3.66	1.33	2.00	4.66	42.66	4.66	6.66	6.33	1.33	27.00
3.00	0.50	2.00	5.00	46.00	2.50	3.00	6.50	1.00	31.00
3.00	1.25	2.75	5.50	40.75	6.25	4.75	8.25	1.25	26.50
2.66	1.33	3.00	5.66	40.33	7.00	5.00	9.33	1.33	24.33
2.66	2.00	2.66	4.33	42.66	7.33	6.66	8.33	2.00	21.66
2.66	1.33	1.33	3.66	44.00	7.00	7.33	6.00	1.33	26.00
3.66	1.00	1.33	4.00	52.00	2.33	4.33	6.00	2.33	24.00
4.00	0.66	1.33	4.33	49.66	5.66	3.66	6.00	1.66	21.00
3.66	1.00	1.66	4.00	44.66	6.66	4.33	5.00	1.00	26.00
3.66	1.33	2.00	3.00	46.00	5.00	4.00	3.66	3.33	30.00
CONTROL GROUP N = 21									
2.66	1.66	1.66	3.66	38.33	7.00	6.33	6.00	1.00	31.66
2.33	2.00	1.66	3.33	36.00	6.66	9.66	5.66	1.00	30.66
2.66	1.66	2.00	3.33	40.66	6.33	11.00	5.66	2.00	24.33
2.66	2.33	1.33	3.33	42.00	7.66	9.33	5.66	3.00	23.00
2.00	2.33	2.00	15.00	24.66	9.00	11.00	7.66	2.33	27.00
3.33	2.33	3.00	15.00	30.00	7.33	9.00	9.33	2.00	22.00
1.66	1.33	2.33	15.33	22.67	11.66	11.66	9.00	1.00	26.33
3.33	2.33	3.00	15.00	30.00	7.33	9.00	9.33	2.00	22.00
3.66	2.33	1.66	5.66	36.00	8.66	10.00	9.00	2.00	21.00
3.00	2.00	2.50	12.50	30.70	9.25	9.50	9.00	1.50	22.50
8.00	2.66	6.00	9.66	21.33	12.00	6.00	13.00	1.33	20.33
7.00	2.33	5.66	9.66	22.00	13.33	4.00	13.00	1.33	21.66
6.66	2.00	6.00	9.66	23.66	11.66	3.66	13.33	1.00	22.33
6.66	2.00	6.00	9.00	23.33	12.33	2.00	12.66	1.00	24.66
7.66	2.33	7.33	9.33	22.66	11.00	3.33	14.00	1.00	21.66
7.66	2.33	6.66	9.00	24.33	11.33	2.33	13.66	1.00	21.66
8.00	2.00	6.33	8.66	24.33	12.66	2.66	14.00	1.00	20.33
7.33	2.33	6.00	8.66	25.00	12.00	2.66	13.00	1.00	22.00
7.33	3.00	6.33	9.00	24.00	11.33	3.00	13.66	1.00	21.33
7.00	3.33	6.66	9.66	24.66	9.66	3.33	13.33	1.00	21.00
7.00	3.00	6.33	10.33	24.00	10.00	3.66	13.66	1.00	21.00

APPENDIX B

B.1

Pre-Test Dependent Measurement Called:
Simple Vowel Words (ST1)

DICTATION TEST ONE

How to Administer this test:

i. Pronounce each word clearly
ii. Give the meaning by using the word in a sentence
iii. Pronounce the word again
iv. Let the pupils write the target word on paper
v. Allow a reasonable amount of time (one minute) for completion

---

CARE	The doctor took care of all the sick people in the hospital.
GIVE	Please give me your book and pencil.
HELP	Two of my friends helped the old woman carry her firewood.
HOLE	The hyena ran to hide inside its hole
BROTHER	My brother is taller than my sister
STARS	The stars and the moon were shining very brightly last night

B.2

Post-Test Dependent Measurement Called:
Simple Vowel Words (ST1)

DICTATION TEST ONE

How to Administer this test:

i. Pronounce each word clearly
ii. Give the meaning by using the word in a sentence
iii. Pronounce the word again
iv. Let the pupils write the target word on paper
v. Allow a reasonable amount of time (one minute) for completion

---

VISITOR	The visitor who came to our school is from England
HOSPITAL	His uncle visited the patients at the hospital.
BABY	My auntie's little baby is crying.
STORY	Maria's grandmother told us a story of the rabbit and the hyena.
SHADE	We rested under the shade of a mango tree on our way to the market.
COCONUT	We rested under the shade of a coconut tree on our way home from the market.

B.3

Pre-Test Dependent Measurement Called:
Complex Vowel Words (ST2)

DICTATION TEST

How to administer this test:

i. Pronounce each word clearly

ii. Give the meaning by using the target word in a sentence

iii. Pronounce the target word again

vi. Have the pupils write the target word on paper

v. Allow a reasonable amount of time (one minute) for completion

---

HOUSE	My grandfather's house has red roof.
PEOPLE	I saw a lot of people in the market today.
DREAM	I saw a giant with a big head in my dream last night
LAUGH	The classroom prefect wrote the names of the girls who always talk and laugh when the teacher goes to the office.
COAT	Whenever it rains, we have to put on our coats so we don't get wet.
PROUD	We are proud of our team because they always win the football games.

B.4

Post-Test Dependent Measurement Called:
Complex Vowel Words (ST2)

DICTATION TEST

How to administer this test:

i. Pronounce each word clearly

ii. Give the meaning by using the target word in a sentence

iii. Pronounce the target word again

vi. Have the pupils write the target word on paper

v. Allow a reasonable amount of time (one minute) for completion

---

THREAD	My mother needed some thread and a needle to sow the stockings.
SCREAM	The boy did not scream loud enough when the lion attacked his village.
SEAT	The shopkeeper rode in the matatu standing up because he could not find a seat.
THIEF	The watchman saw the thief breaking through the window.
NAILS	The carpenters did not have enough nails to finish building the roof.
PLEASE	My father said, "please, don't walk home alone from school."

B.5

Pre-Test Dependent Measurement Called:
Consonant Doubling Words(ST3)

DICTATION TEST

How to administer this test:

i. Pronounce each target word clearly

ii. Give the meaning by using the target word in a sentence

iii. Pronounce the target word again

iv. Have the pupils write the target word on paper

v. Allow a reasonable amount of time (one minute) for completion

---

BIGGER	When I grow bigger, my grand-father will show me how to fish in the river.
HELLO	My teacher asked me to say "hello" to my father when I get home.
PADDLE	The fishermen used their paddle to move the canoe.
HAPPY	My friends came to our house to wish me a happy birthday.
GRASS	Juma's ball got lost in the tall grass near the football field.
SORRY	The chief was sorry that the lions killed the cow.

B.6

Post-Test Dependent Measurement Called:
Consonant Doubling Words (ST3)

DICTATION TEST

How to administer this test:

i. Pronounce each target word clearly

ii. Give the meaning by using the target word in a sentence

iii. Pronounce the target word again

iv. Have the pupils write the target word on paper

v. Allow a reasonable amount of time (one minute) for completion

---

ACCIDENT	The policeman saw the motorcar accident happening
UMBRELLA	Juma's grandmother walked home in the rain because she had an umbrella with her.
SCISSORS	My mother used a pair of scissors to cut the ribbons.
BALLOONS	All the motorcars at the wedding were decorated with balloons.
PERMISSION	Pupils need to ask for permission from the headmaster in order to leave the school compound.
COLLECT	My grandmother took an axe with her when she went to collect fire word across the river.

B.7

Pre-Test Dependent Measurement Called: Sight Words (LTa)

TOP	TOY	ROT	COT
GOAT	COAT	BOAT	FLOAT
CARRY	MARRY	CURRY	HURRY
SKY	SLY	TRY	FRY
LINE	DIME	MINE	FINE
JOHN	PHONE	LONG	LONE
FOREST	HORNET	ROTTEN	RODDEN
FIGHT	RIGHT	MIGHT	LIGHT
PEN	HEN	RED	MEN
SENT	TENT	RENT	BENT
FISH	RICH	FILL	FILM
NEST	REST	STEM	DESK
FULL	FILL	PULL	RULE
MEAT	MEET	MEAN	MET
REAL	READ	LEAD	DEAD
FOOD	MOOD	HOOD	FOOT
FACE	LACE	RACE	MACE
DRIVER	DIVER	RIVER	VIPER

B.8

Pre-Test Dependent Measure Called: Sight Words (LTb)

ROT

FLOAT

CARRY

TRY

MINE

LINE

LONE

FOREST

MIGHT

HEN

BEND

FILL

STEM

PULL

MEET

REAL

HOOD

RACE

DIVER

B.9

Post-Test Dependent Measure Called: Sight Words (LTa)

MONKEY	MONEY	MOTHER	DONKEY
RABBIT	RUBBISH	HABIT	ROBOT
SHAKE	SNAKE	SHARE	CARE
POCKET	ROCKET	PUPPET	SOCKET
SQUIRREL	QUARREL	BARREL	SQUARE
DOLL	POLL	BALL	TALL
SEW	SAW	SOW	RAW
WAS	SAT	WAY	SAT
SHOE	SHOW	SHORT	SHOP
FARE	HARE	HAIR	RARE
TOY	POT	TOP	BOY
FOOT	FELL	FERN	FENCE
PULL	FULL	FALL	CALL
GLASS	CLASS	GRASS	BRASS
CLOSE	CLOTHE	CHOSE	HORSE
HAND	LAND	HARD	HEARD
CARROT	PARROT	NARROW	LORRY
NEST	REST	BEST	TEST

B.10

Post-Test Dependent Measurement Called: Sight Words (LTb)

MONKEY

RUBBISH

SHARE

POCKET

BARREL

DOLL

RAW

SAY

SHOP

FARE

TOP

FERN

FULL

CLASS

CHOSE

HAND

PARROT

NEST

B.11

Scoring Instrument Used
for Dependent Measure: Simple Vowel Words (ST1)

Category	Strategy	Score Target Word	Example of Pupil's Spelling	Example of Target Word
Simple vowel words	Unclassifiable	0	kuk, Omited word	Coconut
	One Vowel omitted	1	set, sat	
	one incorrect but closest vowel	2	cocnut cconut	
	Transitional	3	cuconut	
	One incorrect consonant	4	koconut, coconuk	
	Correct form	5	coconut	

B.12

Scoring Instrument Used
for Dependent Measure: Complex Vowel Words (ST2)

Category	Strategy	Score Target Word	Example of Pupil's Spelling	Example of Target Word
Complex vowel words	Unclassifiable	0	ct, ommited test word	Seat
	One Vowel Present	1	set, sat	
	Two vowels Present, one is incorrect	2	seut, seit	
	Transitional	3	Seat	
	One incorrect consonant	4	ceat, Seak	
	Correct form	5	seat	

B.13

Scoring Instrument Used
for Dependent Measure: Consonant Doubling Words (ST3)

Category	Strategy	Score Target Word	Example of Pupil's Spelling	Example of Target Word
	Unclassifiable	0	blns, or Omitted	
	One consonant Omitted and one incorrect vowel	1	balouns	
Consonant doubling	undoubled consonant and correct vowel	2	baloons	Balloons
	Transitional	3	balolons	
	doubled incorrect consonant	4	babboons	
	correct form	5	balloons	

APPENDIX C

C.1

Categories in the Flanders System
of Interaction Analysis

Teacher Talk	Indirect Influence	1.	Accepts Feeling: accepts and clarifies the feeling tone of the students in a nonthreatening manner. Feelings may be positive or negative. Predicting or recalling feelings are included.
		2.	Praises or Encourages: praises or encourages student action or behavior. Jokes that release tension, not at the expense of another individual, nodding head or saying "um hm?" or "go on" are included.
		3.	Accepts or Uses Ideas of Student: clarifying, building, or developing ideas or suggestions by a student. As teacher brings more of his own ideas into play, shift to category five.
		4.	Asks Questions: asking a question about content or procedure with the intent that a student answer.
	Direct Influence	5.	Lecturing: giving facts or opinions about content or procedure: Expressing his own ideas, asking rhetorical questions.
		6.	Giving Directions: directions, commands, or orders which a student is expected to comply with.
		7.	Criticizing or Justifying Authority: statements intended to change student behavior from nonacceptable to acceptable pattern; bawling someone out; stating why the teacher is doing what he is doing; extreme self-reference.

C.1 continued

	8.	Student Talk-Response: talk to student in response to teacher. Teacher initiates the contact or solicits student statement.
Student Talk	9.	Student Talk-Initiation: talk by students which they initiate. If "calling on" student is only way to indicate who may talk next, observer must decide whether student wanted to talk. If he did, use this category.
	10.	Silence or Confusion: pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.

APPENDIX D

D.1

Summary of Analysis of Variance
for Dependent Variable Called: Feeling

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	79.156	1	79.156	35.817	0.000
ERROR	79.561	36	2.210		

N: 38 MULTIPLE R: .706 SQUARED MULTIPLE: .499

D.2

Summary of Analysis of Variance
for Dependent Variable Called: Praises

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	6.337	1	6.337	19.321	0.000
ERROR	11.808	36	0.328		

N: 38 MULTIPLE R: .591 SQUARED MULTIPLE R: .349

D.3

Summary of Analysis of Variance
for Dependent Variable Called: Use Ideas

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	123.379	1	123.379	82.865	0.000
ERROR	53.601	36	1.489		

N: 38 MULTIPLE R: .835 SQUARED MULTIPLE: .697

D.4

Summary of Analysis of Variance
for Dependent Variable Called: Question

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	361.331	1	361.331	125.402	0.000
ERROR	103.730	36	2.881		

N: 38 MULTIPLE R: . 881 SQUARED MULTIPLE R: .777

D.5

Summary of Analysis of Variance
for Dependent Variable Called: Lecture

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	3010.227	1	3010.227	171.588	0.000
ERROR	631.599	36	17.543		

N: 38 MULTIPLE R: .909 SQUARED MULTIPLE R: .827

D.6

Summary of Analysis of Variance
for the Dependent Variable Called: Gives Direction

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARES	F-RATIO	P
TREATMENT	232.196	1	232.196	76.120	0.000
ERROR	109.815	36	3.050		

N: 38 MULTIPLE R: 8.24 SQUARED MULTIPLE R: .827

D.7

Summary of Analysis of Variance
for the Dependent Variable Called: Justify Authority

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARES	F-RATIO	P
TREATMENT	11.053	1	11.053	1.102	0.301
ERROR	361.202	36	10.133		

N: 38 MULTIPLE R: .172 SQUARED MULTIPLE R: .030

D.8

Summary of Analysis of Variance
for the Dependent Variable Called: Responds

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	229.097	1	229.097	36.515	0.000
ERROR	225.869	36	6.274		

N: 38 MULTIPLE R: .710 SQUARED MULTIPLE R: .504

D.9

Summary of Analysis of Variance
for the Dependent Variable called: Learner initiative

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TREATMENT	7.157	1	7.157	0.547	0.464
ERROR	470.703	36	13.075		

N: 36 MULTIPLE R: .122 SQUARED MULTIPLE R: 0.015

D.10

Summary of Analyis of Variance
for the Dependent Variable Called Silence/Confusion

SOURCE	SUM-OF-SQUARES	DF	MEAN SQUARE	F-RATIO	P
TREATMENT	207.722	1	207.722	10.177	0.003
ERROR	734.777	36	20.411		

N: 38 MULTIPLE R: .469 SQUARED MULTIPLE R: .220

APPENDIX E

E.1

Kenya at a Glance

Surface area	582,644 sq. kms.
Population (estimate, 1989)	24,016,077
Estimated population in year 2000	35.0 mil.
Annual Population Growth	4.1%
Population under 15 yrs old (1989)	52.6
Recorded Employment including informal sector	1.1 mil.
Capital City	Nairobi
Principal port	Mombasa
Former Colonist	Great Britain
Date of Independence	December 12, 1963
Educational Cycle	Primary (8 Years) Secondary (4 years) University (4 Years)
President	Daniel T. arap-Moi
Vice President	Prof. ole-Saitoti
Official Language	Swahili, English
Currency	Shilling (KShs.)
Exchange Rate November 1991	KShs. 28.36 = US$ 1.00
Chief Exports	Coffee, Tea and Tourism

APPROVAL SHEET

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

12-13-91
Date

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