

ANALYSIS OF THE ELEMENTARY SCHOOL TEACHERS' RATIONALE
CONCERNING THEIR USE OF VARIOUS INSTRUCTIONAL MEDIA
(TEACHING "AIDS") IN ELEMENTARY SCHOOL TEACHING IN THE
BUNGOMA DISTRICT AND ELDORET MUNICIPALITY OF WESTERN
KENYA. /

By
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A thesis submitted to the Faculty of Education, University
of Nairobi, Kenya, in partial fulfilment of the requirements
for the award of the degree of Master of Education in
Primary Teacher Education.

September, 1976

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DECLARATION FORM

This thesis is my original work and has not been presented for a degree in any other University.

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ACKNOWLEDGEMENTS

I would like to record my sincere thanks to the following individuals and group of people without whose help this work would not have been possible.

Officials of the Ministry of Education, Schools Broadcasting Service section for their useful information on the instructional role of radio in elementary school teaching in Kenya Mr. Odhiambo, B.A., of the inspectorate, Ministry of Education, for providing me with information on the Teachers' Advisory Centres.

Mr. Umbima, W., a University of Nairobi librarian, Faculty of Education for the extremely difficult work he accomplished in obtaining for me the literature related to this study.

Mr. Kisaka, J.G., of Mosoriot Teachers' College, for his assistance in organising the typing and duplicating of my questionnaire.

The Headmasters/Mistresses and Staff-Members at Kibabii Girls' Boarding school, Kimlili D.E.B., Lunao, Lugulu Girls' Boarding school, Luuya, Magemo, Mitukuyu, Mukwa, Mukweya, Bungoma D.E.B., Commonwealth, Eldoret Union, Kapsoya, Sosiani, Shauri Yako, St. Patrick's, Eldoret Township and Uasin Gishu Primary schools.

Dr. Baldwin, a lecturer and specialist in research methods in Education Faculty of Education, for his invaluable statistical advice.

Above all, I am greatly indebted to Mr. Standa, B.Ed., of the University of Nairobi, Faculty of Education, who acted as an internal supervisor throughout this study. His assistance and the many hours he spent looking up for me the scarce references connected with this course and his advice on the design of the questionnaire are deeply appreciated.

Finally, my gratitude goes to Mrs. Kaman, A.N., for her patience and kindness in typing the manuscript of this thesis.

A B S T R A C T

The present investigation into the elementary school teachers' rationale concerning their use of various instructional media in teaching could not have come at a more convenient time than now. In recent years, both the local press and politicians have criticised primary school teachers over what they call 'ineffective teaching'. The implication of these criticisms is that teachers do not expose primary school pupils to a wide range of instructional media. Assuming these media are available in the Primary schools, is it not valuable to find out why these teachers do not utilise them effectively? This is the crucial question that the present study attempted to answer.

Since it was not possible to administer a test for the above purpose to the entire Primary school teacher population of 94,000 in the country, a small but representative sample had to be chosen. The latter, comprising 211 men and women, urban and rural, trained and untrained, and experienced teachers, were drawn from eighteen randomly selected primary schools in the Bungoma District and Eldoret Municipal Council of Western Kenya.

A review of literature revealed no appropriate instrument for this investigation. Subsequently, a twenty-five (25) item questionnaire was designed and developed for the purpose. The preliminary test in the Nandi, Uasin-Gishu, Kitale and Kapsabet areas showed that this instrument was valuable. On the basis of the results obtained, the questionnaire was modified and items

reduced to sixteen (16) only. This was finally administered to the two hundred and eleven Primary school teachers.

The thesis comprises five chapters. Chapter one is concerned with the description of the problem probed. The second chapter provides the outline of the investigation. Chapter three is devoted to the review of the related literature. Chapter four and five present the results, discussions of these findings, and conclusions and possible alternatives to the existing practice respectively.

The implications of the main findings of this study require urgent attention of the relevant authorities connected with the design, development, selection and supply of elementary school instructional media. This would go a long way to guaranteeing the relevancy of elementary school education to Kenya's educational needs.

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CHAPTER 1INTRODUCTION

"In an attempt to improve teacher education the Government has invested much money in new buildings, equipment and facilities in primary and secondary teachers' colleges¹". Definitely the Permanent Secretary to the Ministry of Education had instructional media in mind when he said this. The evidence is the establishment of forty-five (45) teachers' advisory centres² throughout the country; a production unit at the Kenya Institute of Education; a Schools Broadcast unit; modernisation and expansion of the existing colleges of Teacher Education to prepare teachers who are conversant with various new instructional media and, the inservice courses conducted throughout the country for practising teachers. No wonder, the Ministry of Education is spending thirty percent (30%) of the national annual budget. Schools Broadcast Unit alone has to spend about KSh65,240 during the current financial year ending June 30th, 1976. There is, in addition, a projected plan of establishing an Educational Television (ETV) programme by early 1977 at an estimated cost of one hundred thousand KSh100,000 (Kenya pounds to supplement both primary and secondary school teachers in their teaching. It was not, however, possible to know the amount of money spend on the development and production of instructional media at the Kenya Institute of Education (K.I.E.). Without being presumptuous, one can say that a colossal sum of money is currently being invested in the development

and production of instructional media in this country.

The above discussion leads to a number of obvious questions. Perhaps the major one is, "What justification is there for the Government in general and the Ministry of Education in particular in investing such a colossal sum of money as shown elsewhere? What are the attitudes of school teachers toward these media that are being developed, produced and then supplied to schools?" The only way to gauge these attitudes is through research. But a review of literature revealed no evidence of such an exercise in this field having been carried out. It is only now that the schools Broadcast Unit personnel are developing subject questionnaires designed to evaluate the effectiveness of their "air" lessons to secondary schools. It is unfortunate that these questionnaires have not been designed to cover elementary schools. Nevertheless, ground has been broken for many investigations in a variety of instructional media.

The present study specifically tried to answer the question, "Why do elementary school teachers use the various instructional media in their teaching? Is this because of the teachers' experience, sex, professional training or their environment? Further, it is said that (Educational) technology seeks to employ personnel, space, equipment and process; each for its most efficient intended purpose, but all in close inter-relationship and in tune with society and environment³ ." To what extent

have we done this with respect to instructional media in this country?

For the purpose of this investigation, a questionnaire, comprising twenty-five items (25), was developed and administered to fifty (50) Primary School teachers teaching in fifteen (15) schools in Nandi and Uasin Gishu Districts, and Kitale Municipality. All teachers in every school were expected to respond to this questionnaire. The schools were randomly selected. On the basis of the results obtained the number of items of the questionnaire were modified and then reduced from the original twenty-five to sixteen (16) only; which were then finally administered to two hundred and eleven teachers teaching in eighteen (18) Primary schools in the Bungoma District and Eldoret Municipality of Western Kenya.

The implication of the findings outlined elsewhere in the body of this investigation require urgent attention of the authorities concerned. It suffices to mention that the establishment of a resource centre next to the K.I.E. to co-ordinate and disseminate information on media to all Primary Schools is overdue.

CHAPTER 2

OUTLINE OF THE RESEARCH

This chapter will be treated under five sections, namely, statement of the study, its significance, location, sample size, and statistical analysis.

(a) STATEMENT OF THE STUDY

Instructional technology has an "ancient heritage that can be traced to the time when tribal priests systematised bodies of knowledge and early cultures invented pictographs or sign writing to record, preserve, transmit, and reproduce information. There is even good reason to believe that the first makes and users of tools, living more than a million years ago, systematically taught their children many kinds of skills, attitudes, and concepts thought too complicated for mastery by unsupervised imitation"⁴. There is sufficient evidence of this in this country and elsewhere in Africa. Gay and Cole have reported a research conducted among Kpelle of Sierra Leone in instructional theory and method of teaching number systems to their children. Abaluyia of Western Kenya children unconsciously learn Arithmetic through a number of games for example Lukho in which participants have to perform addition and substration. These unscientific instructional technologies did serve the tribal or societal need of that time. But there is no evidence that someone dared to define

instructional technology in either the physical scientific or behavioral scientific sense of both. Thus it is necessary that this study be introduced with the definition of the ~~term~~ instructional technology.

Instructional media literature abounds with many yet less satisfactory terms for describing the present field of study - instructional technology. These include visual education, audio-visual education, audio-visual "aids", audio-visual materials, audio-visual tools, educational media and instructional media,⁵ just to mention a few, which have tended to confuse practicing teachers and other people involved in the teaching profession. Therefore, it is important that the present problem be clearly defined. The term instructional technology possesses nearly as many definitions as there are persons who advocate its role in teaching. Perhaps Mager's response to the question, why do you use the term instructional technology instead of the term educational technology?, presents us with a concise definition of the present field of study. According to him, to "instruct is to make fairly specific attempt to change behaviour. Instruction is visible, repeatable, measurable - at least it can be. Education on the other hand is a broad and fuzzy thing"⁶. Consequently, instructional media can be defined as the graphic, photographic, electronic, or mechanical means for arresting, processing, and reconstituting visual or verbal information. These include a wide range of materials, equipment, and techniques which play a key

role in the design and use of systematic instruction. But Erickson is more elaborate in his definition of the term instructional technology. He says this is an 'inclusive term referring to both the materials and the instruments, and even to the instructional system to be used with them. What the teacher says and does in terms of systematic application of principles is also a part of a technological whole'.⁷

Now that the field of study has been defined, we turn to the rationale for undertaking the investigation into this problem. Perhaps the theme of the problem would be brought home if our discussion opened with one or two quotations, for example, 'Children in a rural setting have a limited area of experiences and when they are asked to write an English composition, they run dry very soon if they have not been well taught'.⁸ This was a comment ran by an education note-book columnist with the Daily Nation, Kul Bhushan, after the 1974 C.P.E. results had been published. He also went on to say "the Certificate of Primary Education (C.P.E.) results showed that candidates had been ill-prepared for the examination". To say teachers failed in their teaching was rather being too harsh to them. One would have expected some mention of the instructional media available to rural school teachers. However, a few months later, the Permanent Secretary to the Ministry of Education in his address to an audience at one of the Primary Teachers' Colleges revealed the Government's concern

of this problem when he said, 'in an attempt to improve teacher education (and presumably schools as well), the Government has invested much money in new buildings, equipment and facilities in Primary and Secondary teachers' colleges.'⁵ Though these two quotations come from different contexts, their message is more or less the same. The first one implies that instructional media available to rural primary school teachers are either limited, inadequate, or not fully utilized. On the other hand, the second quotation refers to the Government's realization of the significant role of instructional media in instruction in colleges of teacher education and in the Primary schools as well. The evidence of the Government's interest in this aspect of education is seen in the establishment of the forty-five (45) Teachers' Advisory Centres (TAC) throughout the country; the setting up of a production unit (workshop) at the Kenya Institute of Education; Schools Broadcast Unit; establishment of Jomo Kenyatta Foundation to produce the necessary instructional media; recent modernisation and expansion of the existing Colleges of teacher education to prepare teachers who are conversant with various new instructional media and ideas, and the frequent in-service and refresher courses conducted throughout the country for practising teachers. No wonder, the Ministry of Education accounts for about thirty (30%) per cent of the annual national expenditure. Schools Broad-

cast Unit alone is expected to spend about K£65,240¹⁰ during the current financial year ending June 30th, 1976. In addition there is a projected plan of establishing an educational television (ETV) unit by early 1977 at an estimated cost of two million shillings (K£100,000) to supplement both primary and secondary school teachers in their teaching. It was not, however possible to know the amount of money spend on the development and production of instructional media at the Kenya Institute of Education (K.I.E.). But, without being too presumptuous, one can safely say that a colossal sum of money is currently being invested in the development, production, selection and supply of instructional media to schools in this country as shown by the recently reached agreement between Kenya Government and World Bank for an eleven million dollar loan for Primary School Education.¹¹

Despite the heavy investment in instructional technology by the Government, practising teachers strongly feel the present supply of instructional media is inadequate. This is shown by the responses (77%) to the question, 'how would you rate the present supply of instructional media in your school?' Definitely such revelation is both bad and good news for the planners in the Ministry of Education. It is bad news because teachers do not seem to appreciate the planners' efforts to improve the standard of teaching profession in this country. On the other hand, this information serves useful purpose to

the planners in that it raises the question, 'where have we gone wrong?' Consequently, probes into some of these inadequacies will result in new development and production of new media for primary school teachers. Generally, instructional media are inadequate in primary schools in this country. Hence, the primary school pupils are exposed to a limited range of experiences. However, there is sufficient evidence to believe that this problem is partly caused by the existing practice of supplying instructional media to schools. It was not, therefore, surprising, that thirty-two per cent (32%) of the respondents to the above question recommended the immediate abolition of the Kenya School Equipment Scheme (K.S.E.S.). They complained of frequent irregularities in the supply of the ordered media to schools by this agency.

The above discussion leads to a number of observations. Perhaps it is opportune to pose a somewhat obvious question. What justification is there for the Government or for that matter the Ministry of Education in investing so much money in instructional media? There are listless answers to this somewhat provocative question. But one answer is obvious to all respondents to this question - the youths have to be prepared for the future through a well planned educational system. To be precise, the youths to be prepared for nation building. But there is a misleading assumption that all Primary Schools have more or less the same number of instructional media. The present survey has given a different

picture. There is, for example, a sharp contrast between rural and urban schools with respect to the availability of instructional media. In the present survey, it was found that there were only thirteen instructional media (36%) available in all the nine rural primary schools while twenty (56%) were available in urban Primary Schools. The second observation is in connection with the attitudes of teachers toward the various instructional media available in Primary Schools, especially the local resources. Do the teachers understand the role of various new media in primary school teaching? Are these media of good quality, relevant to Kenya's educational needs? Why do teachers use these media in primary school teaching? Is the use of these media determined by the environment in which teachers work, their teaching experience, sex or professional training? The answers to these observations can only be found in a locally conducted research. But a review of the available literature shows no evidence of such a venture in this field. It was only last October (1975) that the schools Broadcast unit attempted to develop subject questionnaires designed to evaluate the effectiveness of a radio as a medium of instruction in secondary schools.¹² It is unfortunate that the investigation was limited to secondary schools only. This should have been extended to primary schools. However, ground has been broken for a start of many useful investigations in a variety of instructional media currently in use in primary school teaching.

In view of the above discussion, an investigation into the rationale of primary school teachers concerning their use of various instructional media in primary school teaching was timely. Thus, the findings of this study, at least, attempted to answer the question, why do primary school teachers use various instructional media in their teaching, is it because of the factors noted above? This is exactly what the present study is all about as demonstrated by the stated hypotheses. Specifically, the following hypotheses were posed:

There is significant difference with respect to the use of various instructional media in primary school teaching between

(i) all men and women in primary school teachers teaching in Bungoma District and Eldoret Municipality of Western Kenya;

(ii) all urban and rural primary school teachers teaching in Bungoma District and Eldoret Municipality of Western Kenya;

(iii) all experienced and inexperienced primary school teachers teaching in Bungoma District and Eldoret Municipality of Western Kenya and

(iv) all trained and untrained (U/^o/T) primary school teachers teaching in Bungoma district and Eldoret Municipality of Western Kenya.

(b) SIGNIFICANCE OF THE STUDY

Although the main aim of this study was to identify some of the factors which influence primary school teachers' use, knowledge and attitudes towards new media in Western Kenya, there is the question of its significance. As mentioned before, this field has not been given its due attention in this country. Though there is much talk of making education have african stint, little attention is being given to utilizing local resources in primary school teaching. One might mention the encouragement being given to local book-writers by the authority to write books reflecting african cultures. This is not enough at all. There are many other local resources such as games, riddles, and other instructional media which our ancestors used in their instruction of youths yet they are not mentioned. As President Nyerere¹³ says in his 'Education for Self-Reliance', these media, unscientific though, were more effective and relevant to the needs of African communities than the Western type of instructional media. Thus there is every good reason to utilize these media of instruction alongside the imported foreign-oriented new media. But such a blend is not possible to produce unless the attitudes of teachers towards these media are assessed. It is equally important that effectiveness of individual instructional media be evaluated apart from locating and demonstrating those local

resources that are in-keeping with modern primary school teaching profession. These facts can only be established through local research. Hence the significance of the present study is that it could be a prelude to many other useful studies in this aspect of the present field of study.

Regular supply of a variety of instructional media to schools does not only facilitate elementary school teachers in their work or preparing teaching (lesson) units in time but also ensures promotion of the quality of elementary school education in this country. However, there is little evidence that schools are receiving their media supplies adequately and regularly. Practising teachers seem not to be happy with the existing system of delivering these items. But nobody has bothered to establish the causes of this dissatisfaction. Thus, the findings of the present investigation could provide a venue for assessing the teachers' opinions on the system of media supply currently in operation. Apart from gauging these views, the educational authorities might benefit from the suggestions advanced by teachers on how to improve on the existing system or on an alternative system to it. It is with this fact in mind that the significance of this study must be construed.

The role of scientific technology is contained in the address of Professor Gacii¹⁴ to the delegates from eighteen (18) countries of Eastern and Southern Africa in Nairobi. He says "If Africa is to develop and keep pace with the rest

of the world, it has to join the world of science and technology." But this cannot come about as a result of mere public addresses at international gatherings. People have to be made aware of such developments through mass media, "Sarazas", and political meetings. The whole exercise must begin at the grassroots. Instructional technology, like the scientific technology, requires publicity through professional conferences, meetings or magazines. This is exactly what is lacking at present in this country. Little publicity has been given to the field of the present study. Primary school teachers have little or no access to new ideas, about scientific instructional technology. Unlike developed countries where teachers have a variety of forums through which to learn about new media, our teachers have to settle with the chalk-boards, lectures, and perhaps class discussions as the possible instructional media. The most common forums for our primary school teachers are churches and beerhalls. However, this is not their mistake. After all, there are no regular professional conferences, journals, magazines or newsletters to keep teachers informed of recent developments in the teaching profession. The harnessing of the available mass media is overdue. An individual teacher's discovery or experiences with new media ought to be conveyed to others through journals, magazines or professional meetings. Thus, a locally conducted research into this field might provide the initiative to do this through its subsequent

results and recommendations. Copies of the professional magazines and journals could be circulated to all schools at subsidised cost or reduced price rate.

Education administrators have to accept and initiate change in the teaching profession if this profession has to sustain its credibility to the public. But this can only come about if these officers are exposed to new ideas resulting from local research in instructional technology through regular meetings with instructional technologists, refresher courses, seminars, conferences, workshops, and professional journals. Teachers could also be participants in these activities. This liason between teachers and their officials could enhance the chances of success of any initiated change. There is evidence that research reports could bring about this feature. Therefore, the significance of research in instructional media in this country is in no doubt.

(e) LOCATION OF THE RESEARCH

This paper presents the results of a study conducted in the Bungoma District and Eldoret Municipality of Western Kenya. The data was collected from primary school teachers in randomly selected schools in the above areas between January 21, and March 16, 1976. Below is a brief description of each of the areas chosen for the survey.

Bungoma District lies between the Eastern border of Uganda to the west, Mt. Elgon to the south and south-east and Trans-Nzoia district to the north and north-east. This area is typical of rural Kenya with its inhabitants engaged in small scale farming, trade and light industries. The main

tribes occupying this volcanic area are the Luyia, by far the largest, Elgon Masai, Kalenjin groups like the Kony, Bok and Bogomek, and teeso who belong to the bantu, nilotic, and nilo-hamitic ethnic groups respectively.

The area lies just above the equator. Thus it experiences equatorial type of climate. There are two rainfall maxima and temperatures, apart from the alpine area, are always high. Soil is volcanic on Mt. Eldon and its slopes but somewhat sandy to the west and south of Bungoma town.

The inhabitants of this district till land, producing maize, coffee, cotton, millet, and sorghum, cassava, potatoes, peanuts and tobacco. They also keep local domesticated animals and poultry which supply them with meat, milk, manure, hides and skins, and eggs. The cash crops are mainly maize, cotton, coffee and sorghum in that order. In addition, green vegetables are grown for sale and local consumption. There is a variety of green vegetables ranging from cabbages to the bitter "baka".

There is a good net-work of roads traversing the district. The major proportion of these roads are not all-weather routes and become impassable during the wet seasons. By the end of this year (1976), there will be three tarmac road sections in the area, namely, Nairobi-Kampala, Bungoma-Mumias, and Webuye-Kitale roads. The later section is still under construction. These roads facilitate the transport of goods and people from all over the district. Strung along these routes are schools, health centres, markets (trading centres) and administrative centres. Besides motor-cars and bicycles, goods from the

slopes of Mt. Elgon and the surrounding areas are still transported by such animals of burden as donkeys and oxen.

Trade in the district is limited to shop-keeping sale of animals and their products, maize, cotton, coffee, and poultry. A number of factors account for this phenomenon. The area is less densely populated; a factor which explains the disinterest of the local community in trade. The latter is regarded as a free time activity. The position of this district with respect to the main commercial centres is another important deterring factor. Bungoma district is far removed from such commercial centres as Nairobi, Nakuru, Mombasa or Jinja. Consequently, the local communities have not been exposed to the external influence with regard to this activity.

As pointed out above, Bungoma is a rural area with a few industrial activities going on. The common-place industrial activities include bicycle repairs at every market centre, charcoal stove-making, and welding business. However, recent years have witnessed the establishments of Panafric paper Mill at Webuye (Brederick Falls), Malakisi cotton ginnery and soap factory, the Bungoma and Kimilili bakeries, the Mt. Elgon saw mill on Mt. Elgon, and the proposed Nzoia sugar factory next to Webuye Paper Mills. Of these firms, Webuye Paper Mills and Nzoia Sugar scheme, have transformed the district very

much. People have been removed from the two sites to make room for construction of factory buildings and residential houses for the workers; electricity from the Kisumu step-down via Kakamega has been installed in the area; many schools have been established to cater for the children of the firm employees, and there is increased interaction between the local communities and the people from other parts of the country who are employed by these firms.

Bungoma town is the administration headquarters. The town lies at the cross-roads of Kisumu via Mumias-Kitale road, Malakici - Kakamega road, and Nairobi - Kampala road and railways line. Webuye is at present the second largest town in the district though there are prospects of it becoming the largest town. Other trading centres worth of mention include Kimilili, Miyanga, Misikhu, Kamukuywa and Uyanja Kibuke.

Eldoret Municipal is one of the modern towns in the country. It is situated in Rift-Valley Province, 'the granary of Kenya.' The town is surrounded by large scale farms - growing mainly wheat, maize, wattle trees and keeping of sheep and dairy cattle. Small vans and tractors towing trailer-loads of milk cans is a common sight in this town.

Like Bungoma town, Eldoret is located at the Cross-roads of the Nairobi - Kampala road and railway line, and the Kitale-Kisumu via Kapsabet or via Nandi Hills road. Unlike Bungoma, this town is an industrial one. These industries process mostly farmproducts like milk, maize, wattletree barks and

wheat. The main industries are the Raymond wool industry, Unga limited, Kenya Co-operative Creameries; the C.P.C. (Startoh Company), East African Tanning Company P.O.S. plywood factory, and Rivatex industry under construction. There are also numerous saw mills in the town and the Alfa Soft drink plant.

This town has a large multi-racial population. The majority of the non-African population are professionals; doctors, proprietors of industries, shop-keepers, advocates and teachers. A number of social amenities have been provided to serve the urban population. These include a cinema, the arts theatres, 'members only' clubs, play grounds, electricity and telephone installations, chemically treated water, all weather roads, modern schools for the growing population of children of town dwellers, and there is a regular supply of daily newspapers. This small area, hardly over 15 square miles, has to itself nine well equipped, primary schools, four secondary schools, a printing press, two secretarial colleges and a driving school. In addition, there are many hotels ranging from the low class to high class quality ones comparable to those found in Nairobi City.

The administration offices of Warend County Council and Eldoret Municipal Council are located here. In addition, there are education, agricultural, information services offices, divisional police quarters and the Law Courts.

* See appendix B

The above description of the areas chosen for the present study presents the reader with the contrasting pictures of the primary school teachers' environments. This meets one of the requirements for this investigation - comparison of the urban and rural primary school teachers' response to the questionnaire used in the study.

(d) THE SAMPLE SIZE

A pilot study was carried out initially to perfect the instrument (questionnaire) developed for this purpose. In all, fifteen primary schools, drawn from Masin Gishu and Mandi districts, and Kapsabet Urban Council, and categorised as rural (8) and urban (7) schools were used. A total of fifty (50) primary school teachers stratified as male, female, experienced, inexperienced, trained, untrained, urban and rural participated in the exercise. These completed the questionnaire and returned it. The following is the schematic representation of the pilot study of the sample.

| | MALE | FEMALE | URBAN | RURAL | EXPERIENCED | INEXPD. | TRAINED | U/Q/T | TOTALS |
|-----------------|------|--------|-------|-------|-------------|---------|---------|-------|--------|
| RURAL SCHOOL TS | 11 | 12 | - | 23 | 12 | 11 | 16 | 7 | 23 |
| URBAN SCHOOL TS | 12 | 15 | 27 | - | 14 | 13 | 20 | 7 | 27 |
| TOTALS | 23 | 27 | 27 | 23 | 26 | 24 | 36 | 14 | 50 |

FIG. I

On the basis of the results obtained the number of items of the questionnaire were modified and subsequently reduced from the original twenty-five (25) to sixteen (16) only; which was finally administered to two hundred and eleven (211) teachers teaching in eighteen (18) primary schools in the Bungoma District and Eldoret Municipal Council of Western Kenya. Their teaching experience ranged from one day to 41 years. There were one hundred and twenty-nine (129) men, eighty-two (82) women, ninety-eight (98) rural school teachers, one hundred and thirteen (113) urban teachers, one hundred and forty-five (145) experienced teachers, sixty-six (66) inexperienced teachers, one hundred and sixty-three (163) trained and forty-eight (48) untrained teachers, see fig. 2.

| | MALE | FEMALE | URBAN | RURAL | EXPERIENCE | INEKPD. | TRAINED | U/Q/T | TOTALS |
|-----------------|------|--------|-------|-------|------------|---------|---------|-------|--------|
| RURAL SCHOOL TS | 67 | 31 | - | 98 | 62 | 36 | 67 | 31 | 98 |
| URBAN SCHOOL TS | 62 | 51 | 113 | - | 83 | 30 | 96 | 17 | 113 |
| TOTALS | 129 | 82 | 113 | 98 | 145 | 66 | 163 | 48 | 211 |

FIG. 2

The eighteen (18) primary schools were randomly selected from a total population of over two hundred schools. But all the teachers in all the selected schools were expected to respond to the questionnaire. However, due to administrative difficulties this did not happen. A letter requesting all teachers to avail themselves for the exercise on the days the researcher would be visiting the schools was circulated to all the education officers in the said areas. Unfortunately, this information was not conveyed to the schools concerned. It was surprising to see copies of this letter lying in the 'In-wire trays' on the tables of these officials! This could be one of the reasons behind the somewhat poor response. As expected, some of the teachers happened to be absent on the day of the visit for unavoidable reasons. These included maternity leave, meetings of heads of primary schools, illness or other unspecified reasons. Generally, rural school teachers were suspicious, reluctant or obstinate to have this instrument administered to them. But after having been given instructions the majority of teachers, especially those teaching in Urban schools, willingly responded to the questionnaire.

Instructions were specific. Respondents were assured of confidentiality of their opinions and that the results would not affect their designation. In addition, respondents were requested to respond to all the items, with a tick marking in one of the provided boxes as per item, and comment on their decisions in the provided spaces. Then copies of the question-

naire was circulated to all the teachers present at that time. Teachers were allowed as much time as five hours to respond to the questionnaire. In some special cases, the respondents remained with the questionnaire over night or as long as a week. Thereafter, copies of the questionnaire were collected and kept in the custody of the researcher.

The decision to administer the questionnaire to all the teachers at the randomly selected schools was taken on the basis of the results of the pilot study not reported here. Initially, it had been designed to have twenty-four (24) cells with matching number of respondents. But the pilot results showed that there were fewer untrained teachers and the P-3 teachers or none in some of the urban schools to be matched with their counterparts in rural schools. Further, there was not much difference between the P1 - teachers and the P3 - teachers. Subsequently, these two were combined to form the trained teachers category. On the next page are the schematic representations of the original design (fig. 3) and the modified one (fig. 4);

| | | P-1 | | P-3 | | U/Q/T | | |
|--------|----------------------------|-------|-------|-------|-------|-------|-------|--------|
| | | URBAN | RURAL | URBAN | RURAL | URBAN | RURAL | TOTALS |
| MALE | EXPERIENCED TS | X | X | X | X | X | X | X |
| | INEXPE INEXPERIENCED TS | X | X | X | X | X | X | X |
| FEMALE | EXPERIENCED TS | X | X | X | X | X | X | X |
| | INEXPERIENCED TS | X | X | X | X | X | X | X |
| TOTALS | | X | X | X | X | X | X | X |

Fig. 3: Pre-original design of the sample.

| | | TRAINED TEACHERS | | UNTRAINED TEACHERS | | TOTALS |
|--------|------------------|------------------|----------|--------------------|----------|--------|
| | | URBAN TS | RURAL TS | URBAN TS | RURAL TS | |
| MALE | EXPERIENCED TS | x | x | x | x | x |
| | INEXPERIENCED | x | x | x | x | x |
| FEMALE | EXPERIENCED TS | x | x | x | x | x |
| | INEXPERIENCED TS | x | x | x | x | x |
| TOTALS | | x | x | x | x | x |

Fig. 4: the modified design of the sample.

The difference between the two designs is quite clear. The revised design has sixteen cells and two main columns for trained (qualified) and untrained (U/Q/T's) teachers instead of the original twenty four cells and three main columns for the P=1, P=3, and untrained teachers. The modified (fig. 4) design overcomes the cumbersome and somewhat embarrassing exercise of administering the questionnaire to a few selected teachers who could meet the requirements based on grades, experience, sex and the environment of the school. In this design the questionnaire was administered to all the teachers at the selected schools without the above prerogatives.

(o) THE STATISTICAL ANALYSIS

The questionnaire for this survey was of discrete type. Hence, the appropriate statistics were non-parametric ones. That is, the analysis had to be that of item by item type. The statistic chosen for the present analysis was that of chi-square (χ^2) mainly for establishing the characteristic associations of the selected sample as compared with the large population. This analysis was appropriate mainly for the content, and items 7, 8, 14, and 15. However, the analysis of question 1, 3, 9, and 16 was rather different.

In questions 1, 3, and 9 the main interest was in finding out the available instructional media in rural and urban primary schools, the distribution of radios in these schools, and the type of instructional media literature available to teachers in these schools respectively. For the purpose of comparison of

the results obtained in question 1, block graphs was used. But in question 3 and 9, the appropriate statistic for comparison was the mean and percentage and the spearman correlation coefficient in the case of question nine. In question sixteen (16), the main interest was to establish the most popular instructional media from the six media given to the respondents. The popularity was assessed on the basis of the amount of the time allocated by the respondent to each of these media. Then, the mean of the time as per category of the respondents was established—that is, ranking of these instructional media in terms of time allocation by urban and rural school teachers, experienced and inexperienced, trained and untrained, and men and women primary school teachers.

Generally, the main statistics used in this survey were the chi-square, non-parametric statistic, and the basic statistics. Thus, many figures or tables are presented in the third chapter to simplify the discussions.

CHAPTER 3

REVIEW OF RELATED LITERATURE

As mentioned in the introduction, instructional technology is a field in which little local research has been conducted. The few reports that are available have been done mainly in Tanzania Mainland and Uganda by their respective institutions of higher learning. Beside, there are other reports of research conducted in other parts of Africa by the International Institute for Educational Planning. The latter were financed through a contract with the United States Agency for International Development (U.S.A.I.D.) However, the review of related literature will not be restricted to these reports only. This will be extended to studies related to the present investigation that have been conducted elsewhere in the world, especially in the United States of America and Great Britain. The first in our series of review is the Survey of Audio-Visual equipment in Tanzanian Schools and National Colleges.¹⁵ Its purpose was to find out the amount and variety of educational media existing in Tanzania's post-primary educational institutions.

In this survey, all the twenty-two (22) colleges of National education, and one hundred and six (106) of the total one hundred and fifteen (115) Secondary Schools in Tanzania mainland in 1970

were used. Of those used in this Survey, Seven (7) Colleges only and eighty-eight (88) Secondary Schools returned the questionnaires sent to them by post on September, 1970. No reminders were sent to those institutions which did not respond. The questionnaire, comprising twenty-one (21) items, was categorised as number of teachers and students enrolled, electricity supply, the main equipment available in these institutions, conditions and use of these equipment, and educational media personnel.

The findings of this must have been of much interest to teachers, educational administrators and planners. It has revealed that a majority of Tanzanian Secondary Schools in that year were understaffed - approximately one teacher for thirty pupils. This ratio (1:30) shows that Secondary School teachers were overloaded and possibly not able to discharge their duties properly. In addition, all the Tanzanian post-primary educational institutions had electricity (generator or mains) supply, a fact which is debatable. It is true that most of the colleges of National Education could be supplied with electricity when their historical back-grounds are considered since these were established mostly by Missionaries who willingly installed electric generators to supply electricity to their mission schools and teachers' colleges. And it is not likely that when the Tanzanian Government took over, it maintained these generators or supplied these institutions with the mains electricity where it was possible to do so. But to

say that all the Secondary Schools were supplied with electricity, in fact 89% of them were on the mains electricity, is somewhat misleading. This raises the question of choosing the sample used in this particular survey - how much unbiased was the selection? The fact that 89% of the Secondary Schools were supplied with mains electricity implies that the majority of these institutions were either in the urban areas or around these areas. If this is true, then these are the old established institutions like Tabora, Malangali or Bukoba which are able to afford most of the equipment the research was based on. The study should have attempted to specify the location of those secondary schools which responded to his questionnaires. Out of the one hundred and fifteen (115) secondary schools in Tanzania in 1970, there must have been some which were of new establishment and situated in rural areas. One wonders whether rural Tanzania is so much blessed to have mains electricity supply!

The recommendations and suggestions made in this survey are quite useful. That all secondary schools and colleges of National Education should have each one member of staff with educational media background is plausible. But the truth is that this does not happen in most schools in East Africa. Perhaps this is so because of inavailability of media trained staff members or those in-charge of staffing do not recognize the role of such personnel in the teaching profession. The importance of preparing teachers in instructional technology was long recognised by Powell, L.S.,¹⁶ when he wrote: "naturally

with this serious commitment to the use of (instructional) media, new staff need training in order to take full advantage of the facilities which are provided” This goal can not be achieved in a situation where Universities and Colleges of teacher education produce teachers who are ill-prepared in instructional technology. This is exactly what Berman complained about when he said: (“the College classroom has been used mainly to transmit information about educational innovations. Much less often has the class-room been used as a show-case which actually incorporates the innovations¹⁷). But this can’t be done unless these institutions are staffed with media specialists. Comparatively, Universities are better off in this respect than colleges of teacher education. The latter do not have staff-members specialised in instructional technology. What happens is that each department places an order for its instructional materials which on delivery, are stored by it. Once Colleges of teacher education and Universities can provide primary and secondary schools with teachers who have been exposed to media education, this feature will give way to a more streamlined organisation in which one member of staff will be incharge of all the instructional media available in each institution. Such a re-organisation won’t meet much opposition from staff members since most of them would have witnessed, with appreciation, this arrangement at College.

In addition to the establishment of school or college materials centre organised by a media specialist members of staff, it was expected that mention of national materials centre and district materials centre would have been made. Whether this exclusion was intended or not, the fact remains that recommendations and suggestions made by such a study can not be complete without the establishment of a national materials centre responsible for the production, development and supply of new media. That is, it would be responsible for the dissemination of information and new ideas to all educational institutions. Perhaps, it was assumed that the institute of national education would fulfil this function. This institution must be already pre-occupied with other activities. Even though, it is imperative to set up such a body to the Institute of National Education. This would be in recognition of the role of instructional technology in education. The activities of these two bodies could be co-ordinated through frequent, consultative meetings.

The suggestion that educational institutions use more new media, especially tape recorders, in college and school instruction could not have come at an opportune moment. Since most of the institutions seem to have electricity, the adaptation of such media won't pose serious problems for the Tanzanian planners. It was extremely heartening to learn that as far way back as in 1970, all the secondary schools in Tanzania

mainland had been provided with Tandberg tape recorders. This is a big achievement for a developing country like Tanzania! Subsequently, useful programmes like radio broadcasts can now be tape-recorded for the future use in teaching. However, the educational administrators and planners should strive to avoid the Niger experience,¹⁹ a case in which teachers were deficient in conducting the follow-up exercises of educational television lessons. Generally, proper arrangements should be made before any attempt to use new media in instruction is contemplated.

Mr. Jengo's conclusions drawn from his Tanzania survey are very important. Developing countries should consider them seriously and adapt them where possible. However, these countries should consider the question of trained man power to utilize these new media and their real effectiveness in teaching. There is need to develop the creative attitude in our teachers as it was indicated by one of the conclusions in the survey under review. This conclusion runs: (..... But if this education is to be meaningful, it should try to stimulate and encourage new ventures and experiments on new approaches and techniques to make media presentations more effective in developing student creativeness, problem - solving abilities and greater transfer of learning.") Teachers as well as pupils in East Africa do not have opportunities to develop divergent thinking. This is so because of the nature of national educational systems. The activities of curriculum developers are, apparently, determined by public examinations. Hence, teachers, like school children,

tend to get their minds on these educational 'hurdles' so much so that creative activities are ignored altogether. These examinations are very much emphasised in Kenya and Uganda but to a less extent in Tanzania. Unless there is a major re-organization in the educational system, any attempt to introduce new media in school instruction will not succeed. The 'talk and chalk' method will continue to prevail and relatively little progress will be made in the application of some of the effective new media.

One interesting thing about this survey is that no mention was made of the available equipment in Primary schools. It is common knowledge that any change in traditional instruction which does not include primary schools often leads to failure. Products of Colleges of National Education will eventually find themselves working in these schools. It would be very much disappointing to find that these schools do not possess the audio-visual equipment which the colleges have instructed their students to utilize in teaching. Therefore, it was necessary that a survey of audio-visual equipment available in primary schools should have been conducted to enable colleges to prepare their students in the use of the ACTUALLY available new media. This would ensure a smooth transition from primary school to secondary school and college of teacher education and vice-versa. In addition, children would be exposed to a variety of instructional

media that they are likely to come across later in their school career. At the moment there are teachers who cannot operate even a camera! But if such equipment were placed at the disposal of primary school children, such a problem would not arise. It is an accepted fact, as Knight says, that 'everyone seems to agree that teachers should be made aware of new equipment, materials, and systems, but at present, little is being done to bridge the gap between available knowledge and teachers who actually implement this knowledge on the job.'¹⁹ This gap can hardly be bridged when the colleges of teacher education have no adequate information on the equipment and materials currently in use in primary schools. It is only when such information is available to them that can the professional training provided be said to be meaningful and adaptable to the existing conditions in the Primary schools. As a matter of fact, we need teachers who are properly trained in handling some of the technical equipment as well as being able to adequately conduct a class with the help of the elaborate written documents which are developed as supplementary materials in case of a breakdown in such gadgets like fuses or television/radio reception. This fact is emphasised in the subsequent paragraphs.

The following review is on the attitude survey planned, pretested, and field tested among elementary school teachers, administrators, advisors, and some parents by a research team in the Ivory Coast during the 1971/2 period.²⁰ The main interest was to establish the teachers' opinions and attitudes towards

the educational television project in the Ivory Coast.

A random sample of eight-fifty (85) first grade (ETV) educational television teachers (19% of the total number) was stratified according to enrollment rates in the region and a rural/urban index. A questionnaire was administered. Purposes of the questionnaire were multiple: To accustom field teachers to the mechanics of filling out information and opinion forms; to capture the initial reactions of professional concerning the ETV programmes; to raise field staff morale by bringing a direct personal contact from the project headquarters; to begin the training of Ivoirian researchers, and to experiment with the complete cycle of field research.

The initial findings of this survey were quite encouraging to the project organisers. Results of the survey revealed predominant teacher attitudes concerning the functioning of the ETV operation and the behaviour of pupils. For example, most ETV teachers believed that they could adequately conduct a class in case of a breakdown in television (TV) reception with the help of supplementary materials. It is clear that these teachers highly regarded the TV as complementary to their teaching, the opinion contrary to that held by Kelley. In his view, 'teachers have tended to be wary of any use of TV which would completely eliminate their day-to-day function in the educational process'

However, the use of television in teaching in developing countries poses a number of problems, though surmountable if proper planning is mounted. Television, open or closed circuit type, is an expensive medium yet the current schools' educational needs are generally too limited in scope or fragmented in need to warrant the high expense of a mass medium. In addition, very little, if anything, has yet been done to explore the possibilities of combining the various other modern aids with television or sound broadcasting.²² It would be helpful to carry out pilot projects on the supply of generator or mains electricity. Lack of electricity is a major set-back to the introduction of new media in most of Kenya's primary schools. It is not expected that this problem will be overcome soon, considering the cost of installing electricity in all the more than six or more thousand (6,00) elementary schools. Another problem facing the developing countries is that connected with the operation maintenance and repair of television. At the moment there are very few qualified television technicians, let alone the teachers with such training, who would be entrusted with the duty of operating, maintaining and repairing this sophisticated equipment. But one indisputable fact is that developing countries have to keep abreast with developed countries in matters connected with education. This does not mean ignoring the local resources totally. There should be a

blend, a smooth one too, between the new media with foreign orientation and a selected variety of local resources relevant to modern educational needs in developing countries. The latter have to 'come to grips with learning process'.²³

The above said blend cannot be achieved easily. This requires proper planning and organization of the programme. Teachers have to be educated in the value of educational television in primary school teaching. After all, these are the people who count most in any educational innovations. Training facilities should be provided for the preparation of the maintenance and repair forces to support the teaching force. It is important to note that this scheme be initiated before the establishment of the ETV. The technician trainees should not experience the frequently denounced frustration from the expatriate trainers. This support force need inducement more than anything else to boost their morale. They should be paid well and also be housed at the District Education headquarters. In addition to the provision of comprehensive training to the teaching and support labour force, well written television documents acting as supplementary materials should be supplied to all the primary schools in this country by the educational television unit of the Ministry of Education. The Kenya Schools Broadcast Service unit deserves credit in this respect. Since its establishment, it has prepared and regularly supplied such materials to schools

and colleges of teacher education. These are always in two volumes - supplementary teachers notes and the outline of the schools broadcast service programmes for schools and colleges for the specified period.

That Ivorian ETV teachers judged in-service TV instruction as highly useful in presenting new subject matter to the teachers and in helping them prepare their lessons was expected. It is during such meetings that teachers express their own views concerning the use of certain equipment in teaching. Beside, teachers would be trained in the use of these new media. Special emphasis would be placed on proper preparation before and after the TV lessons, and television remedial instruction. Currently, the majority of teachers in this country do not seem to appreciate the significance of remedial teaching; and in case of the breakdown in radio reception, they cannot conduct a class. Whenever this happens, teachers resort to letting pupils 'read for themselves or go to the play ground for free activities.' It is high time our teachers valued these children's time.

As was the case in the present survey, teachers solicited closer supervision and guidance. However, it is important to note that teachers would welcome such a practice with some reservation. They would hardly tolerate bullying educational administrators when carrying out such duties. What they need is gentle and understanding reaction from these officials whenever teachers error in their teaching. They demand respect from their bosses.

Generally, few teachers whole-heartedly accept and even implement the administrators' suggestions made in respect of their profession. This is so because most of the officials do not give the teachers the impression that they know more than the teachers, let alone as much as the teachers themselves, as far as instructional technology is concerned. The present survey has revealed this sort of attitude among the Bungoma District and Eldoret Municipal Council elementary school teachers. Perhaps, teachers still regard these people as the fierce and uncompromising administrator of the colonial era. It is up to the educational administrators to prove these teachers wrong in this particular respect! But the change in the approach to educational inspection should not be done at the expense of our 'standard' of education.

The finding that 'television pupils' were superior to those in 'traditional classes' can be regarded as a good publicity of television instruction not only in the Ivory Coast but in all developing countries. But there is need for many more attitude surveys in instructional technology in other areas to justify the cost of establishing an educational television (ETV). If the subsequent findings of these studies positively confirm the Ivory Coast survey then those nations contemplating the use of ETV instruction can now introduce it in their respective learning process. In most countries where new media have been introduced in teaching research have tended to come much later.

What normally happens is that these countries depend very much on the research reports from the developed nations. But cultural or environmental differences seem not to be taken into account. Opinionnaires should be developed for the teachers, parents and even school children regarding the new media to be introduced. The results could guide the educational administrators and planners in this new adventure. It is only after such survey that can someone claim that 'a general attitude of confidence in and support for the ETV system was discovered'.²⁴ As a matter of fact, the practice of adapting innovations from elsewhere must be held responsible for lack of creative attitude among most of our teachers.

On the whole, the attitude survey conducted in the Ivory Coast showed that educational television has a bright future in the third world, especially in Africa. No wonder, Kenya is contemplating the idea of introducing this media in a few selected schools in Nairobi by early 1977.²⁵ The University of Nairobi already uses a closed - circuit television for its undergraduate courses in education. However, the high expense of establishing ETV in the developing countries could prove forbidding, UNESCO and some of the developed countries should assist these poor nations in improving the quality of education by subsidising the cost of new media and supplying the trained personnel to man them meanwhile local people (teachers) are

being prepared. It is my contention that when introducing new media, nations should use Ivory Coast approach. They should begin with a few selected institutions and then carry on surveys to show whether the innovation is acceptable to both teachers and school children. It is only then that it can be extended to a much bigger geographical region. In the case of Kenya, the question of renovating the old buildings to accommodate this equipment and installation of generator or mains electricity in all the schools or a few selected schools in every region should be considered seriously.

The problem of introducing an educational television in teaching profession in Kenya is very complicated indeed and the prevailing position is a challenge to the educational administrators and planners. To most Kenyan teachers innovation in teaching profession is still what Austick said of Great Britain when he said 'up to about 1950 "technology only washed lightly upon the shores of instruction".²⁶ We have not reached a stage where some educator can suggest that 'chalk-boards be removed from the existing rooms'.²⁷ If this were done it would be everyone's guess as to the educational implications of the move. Even in the developed countries, many people still suspect the effectiveness of some of the equipment being introduced in teaching. It is pertinent here to quote Norman Dyer. Writing in the Education journal Dyer says 'it is arguable that

the most powerful aid in international communication is provided by radio, especially sound radio'.²⁸ This reveals a clear discrepancy among the educators themselves in the developed nations where these equipment have been in use for some time now.

The kind of innovation required in Kenya's teaching profession is not the introduction of new media imported from developed countries, especially United States of American and Britain, but ensuring, by improved in-service and pre-service education, that teachers are capable of using profitably the materials (and equipment) already available and the opportunities offered to them by the Kenya Institute of Education. There are a number of instructional media that are currently under-utilised namely, local resources and radios. There is need for a local research in the utilisation of the available materials and equipment in primary schools before deciding which equipment and materials should be established and supplied to these educational institutions. Maclure²⁹ conducted such a survey in the South of England to see how intensively the equipment which the schools already possess was being used. As he correctly pointed out, 'the only way of finding out what teaching aids the schools possess is to do a school-by-school survey'.

Primary and secondary schools were used in this survey, "looked in a cupboard", conducted in the south of England and directed by Professor Vaisey. The survey was on the utilisation

of equipment in teaching. These items included tape recorders, language laboratories, projectors, TV, calculating machines, and libraries. The exercise confirmed the widespread belief that the extent to which teaching aids are used varies widely from school to school and that in many cases, expensive items of equipment spend ninety (90%) per cent of the school week locked up in dark cupboards. The present survey also found the same variation in the instructional media available in primary schools. Generally, an average school had eight (8) to ten (10) media available though a few indicated that they used up twenty-eight (28) instructional media. The available equipment were limited to type-writers, radios, and overhead projectors. But it is important to note that, apart from radios, just a handful of schools possessed these equipment. This was so because of the high expense, and the inavailability of energy resources to accompany these equipment.

The conclusion of this survey must have surved a great challenge to the British Local Education Authotities. It was found, for example, that 'contrary to several opinions there is no general problem of under-provision of audio-visual aids in the present circumstances Existing equipment is under-utilised. If there is to be increased use of such aids in teaching, then the first task should be to increase utilization of the existing equipment, and only when utilization is

optimized should there be more physical investment

The immediate implication of this conclusion is that there was not enough supervision in the Primary and Secondary Schools used in the survey to uncover this embarrassing feature. Alternatively, these equipment, whether supplied by the British Government or bought with funds raised by the Parent - Teacher associations, were being supplied to schools that did not need them. This raises the question of design and selection of these equipment. Why were they selected in the first place? Was this done because the Government or local Education Authorities were under pressure from certain commercial concerns producing these equipment or because American schools had gone technological? These and many other questions can only be satisfactorily answered by the British authorities concerned. A similar situation exists even in this country. There are educational institution possessing new media equipment, either bought or donated by organisations or individuals, which they do not utilise. Some of these equipment include pianos, over-head projectors, phonographs, type-writers and tape-recorders. Perhaps this is so because the teachers training did cover the use of these equipment in teaching. For example, it is not easy to convince some teachers that a record player or tape-recorder can be utilised as an instructional media. They have lived to know these equipment as entertainment apparatus, and that is all. In addition, there is this common feeling that

teaching materials and equipment are 'aids', only used when a situation warrants them; they do not regard them as instructional media in their right.

That it was found that British teachers under-used the available equipment was quite unfortunate. Developing countries should view this revelation as a challenge to them. There is apparent need to re-organise the teacher training institutions so that they can accommodate the new ideas being injected into education resulting from research studies and professional workshops. But as noted above, teachers should be prepared in the use of the available materials and equipment in educational institutions. For this to happen, there should be closer co-ordination between the Kenya School Equipment Scheme and the colleges of teacher education. Information on the type and quantity of the materials and equipment supplied to schools should be passed on to these institutions through pamphlets compiled by the scheme dealing with the supply of these media.

If teachers have to create an acceptant climate³⁰ in the classrooms they must utilise a variety of instructional media. But as the teachers used in the present study unanimously said this does not happen because 'the use of teaching materials and equipment in teaching is very much determined by the nature of the subject and subject-matter to be taught'. This was a reflection of existing, compartmentalized organisation of teaching items whereby each subject head selects instructional materials

and equipment suitable for that particular subject. There is absolutely no learning unit that cannot utilise any of the existing instructional media in primary schools. What is lacking is the teachers' initiative to use them.

Comparative to developed countries, Kenya's Primary Schools have inadequate supply of teaching materials and equipment. Some of the schools do not even possess chalk-boards or exercise books for pupils to use. This can be explained in terms of the sharp increase in elementary schools to cater for the ever-growing population of school-going age children; poor communication and transport systems in some areas, and lack of secure storage facilities. The common complaint among teachers is that materials and equipment supplied to them are often stolen or maliciously damaged by children and even adults let alone the climatic conditions which account for even a larger toll. Despite this, suggest to primary school teachers that they buy some items to replace those lost or damaged they simply become irrational. But one thing is obviously lacking. At present there is no co-operation between parents and teachers otherwise such problems as putting up secure storage facilities and augmentation of the available teaching items could quite easily be solved as the establishment of harambee schools has shown. After all the British Parent-Teacher Association are doing this.

Before any physical investment in teaching items is envisaged it is necessary to consider Howson's advice. He says

'... it is clear that emphasis in the near future should not be placed on producing yet new courses or on polishing-up those produced in the past few years, but in ensuring, by improved in-service and pre-service education (and one way in which the former can be interpreted is simply providing the teachers with time for self-education) that teachers are capable of using profitably the materials already available and the opportunities newly offered to them by the examination

Boards. 31

This is only true when the schools already have adequate supply of instructional media and when there is unrefutable evidence that the teachers are under-using them. But in a situation like the one prevailing in developing countries where some schools do not have adequate tuition blocks and teaching items, this advice should not be strictly adhered to. There should be dual treatment of providing pre-service and in-service education, and great physical investment in teaching items. All the available evidence shows that these two things can not be separated.

After all, it is a well-known fact to-day that education is not only an expensive asset but also labour intensive.³² As Peter Drucker in The Age of Discontinuity claims 'teaching today requires far too many people' - technicians, materials centre personnel and the teachers themselves. One of the more troublesome aspects of teacher education, not only in developing countries but also throughout the world, is the failure of many teachers to teach as they were taught by colleges at which they were prepared.³³ Perhaps here lies the main explanation to Drucker's claim. This fact was established in a research conducted and reported by Eash on programmed learning. He concludes that

'It is our contention that good materials imperfectly implemented in the classroom and not in accordance with the producer's design are as much as source of learner problems as are ill designed materials.'³⁴

This quotation implies that teachers have to be well prepared in the use of the new media they are likely to come across in their day-to-day teaching and if the resulting frustrations have to be avoided. It is important to note that far too many new teaching equipment are being produced for an average teacher to cope up with. Thus, in-service courses should be intensified to keep them up-dated in the recent developments in instructional technology. In addition, pre-service courses should impress a

broader scope in instructional technology than those offered at present. Teachers should not only be trained in how to use a chalk-board or how to organize a story telling class but also how to handle some of the new equipment that are now available to them. There is need for a blend of some traditional media and new media if there has to be a systematic educational reform. But as Bright correctly points out, 'systematic educational reforms take time' and are generally expensive.³⁵ However, these developments must move in the direction of accommodating the changing needs of society. In a developing country like Kenya the new media are expected to overcome the problems of crowded classrooms, shortage of teachers, and enable children enjoy learning process. But much emphasis is on the relevancy of the education provided through such media to Kenya's needs.

Throughout this chapter, discussion has been on the use of educational media and the training of teachers who utilise them. But one burning question that has yet to be answered is why do teachers use or not use the various instructional media available in their schools? The answer to this question, though not proper, can be found in the subsequent chapter.

CHAPTER 4

RESULTS AND DISCUSSION

The following presentation and discussion of the results of the present study is in line with the statistical analysis discussed in chapter 2. That is, the presentation is on the item by item analysis approach. Subsequently, it is logical to begin with item (question) one on which the respondents were presented with some of the common instructional media currently in use in primary school teaching and were requested to indicate, with a mark in the provided boxes, those available in their respective schools.

In the discussions of the results of item (question) one that follows, one important assumption was made: if anyone school teacher at a school indicated that an instructional media was available then it was taken for granted that the school had or used that particular media. Thirty six (36) instructional media, both software and hardware, were presented to the practising teachers at the eighteen (18) urban and rural primary schools in the above said areas. As expected, urban primary schools were found to have more instructional media available to them than the rural schools - there were twenty (56%) instructional media available in all the nine schools in town compared to thirteen (36%) only in rural schools. In addition, three (8%) instructional media were

available in eight of the nine urban schools in the sample and five (14%) in eight of the rural schools; one instructional media (3%) was available in seven of the urban school and two (6%) in seven of the rural primary schools; five (14%) instructional media were shown as being available in five of the urban schools and four (11%) in the rural schools; three (8%) instructional media were available in four of the rural schools in the sample and one media (3%) in three urban schools. However, three (8%) instructional media were available in two rural schools and two (6%) media in urban schools; three (8%) media available in only one urban school and one (3%) in a rural primary school, and one instructional media, a camera, was not available in urban schools and the overhead projector, film-strips, over-head transparencies and a piano were not available in anyone of the rural primary schools. The fact that these media were said to be not available in these schools does not necessarily show that they are not available locally. Many leading school equipment suppliers stock them.

These were 3% and 11% of the instructional media presented to the primary school teachers. The schematic presentation of these results is shown by the following block-graphs (Figs. 5 and 6):

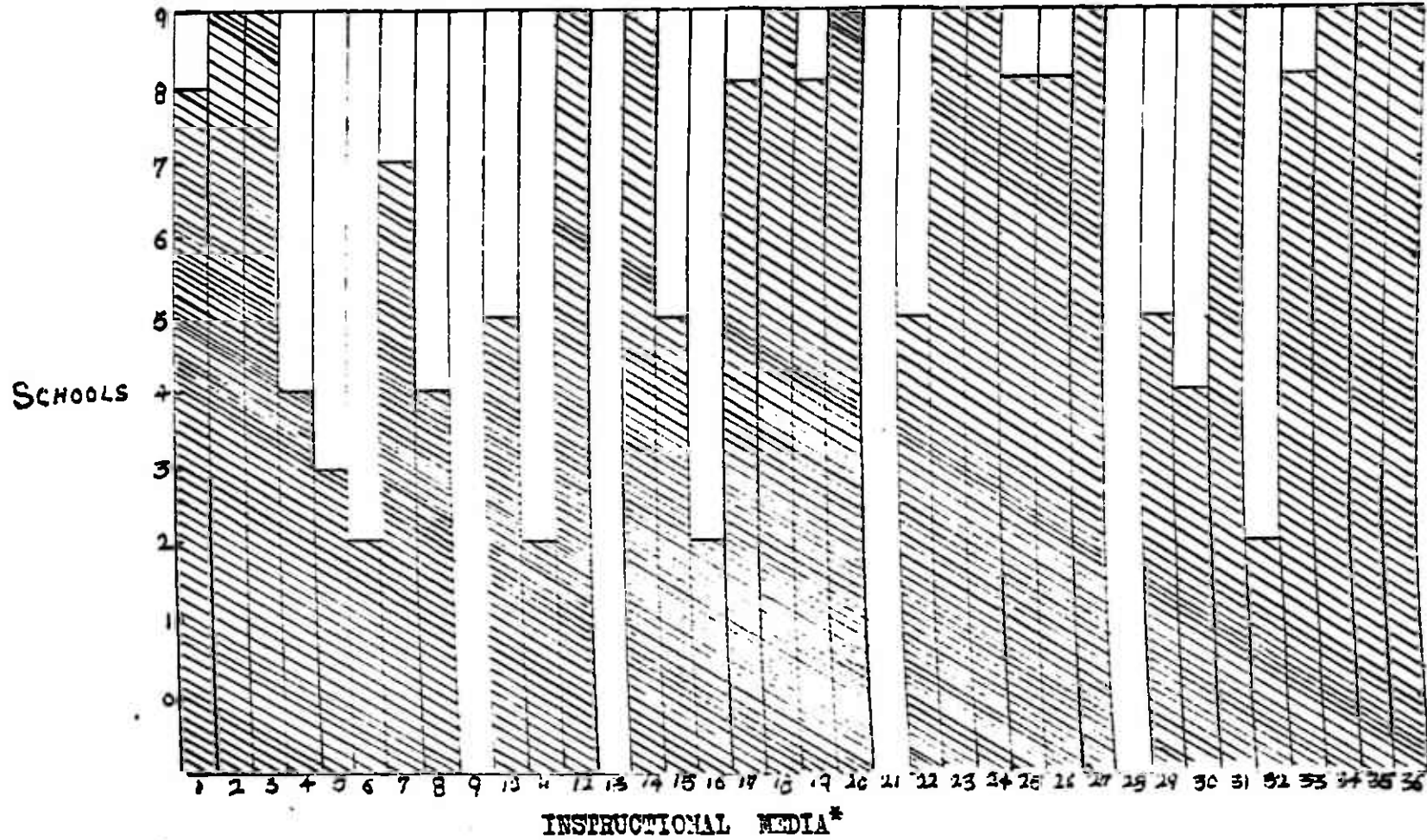


Fig. 5: Rural Primary schools - Bungoma District

* Appendix A (Item 1)

SCHOOLS

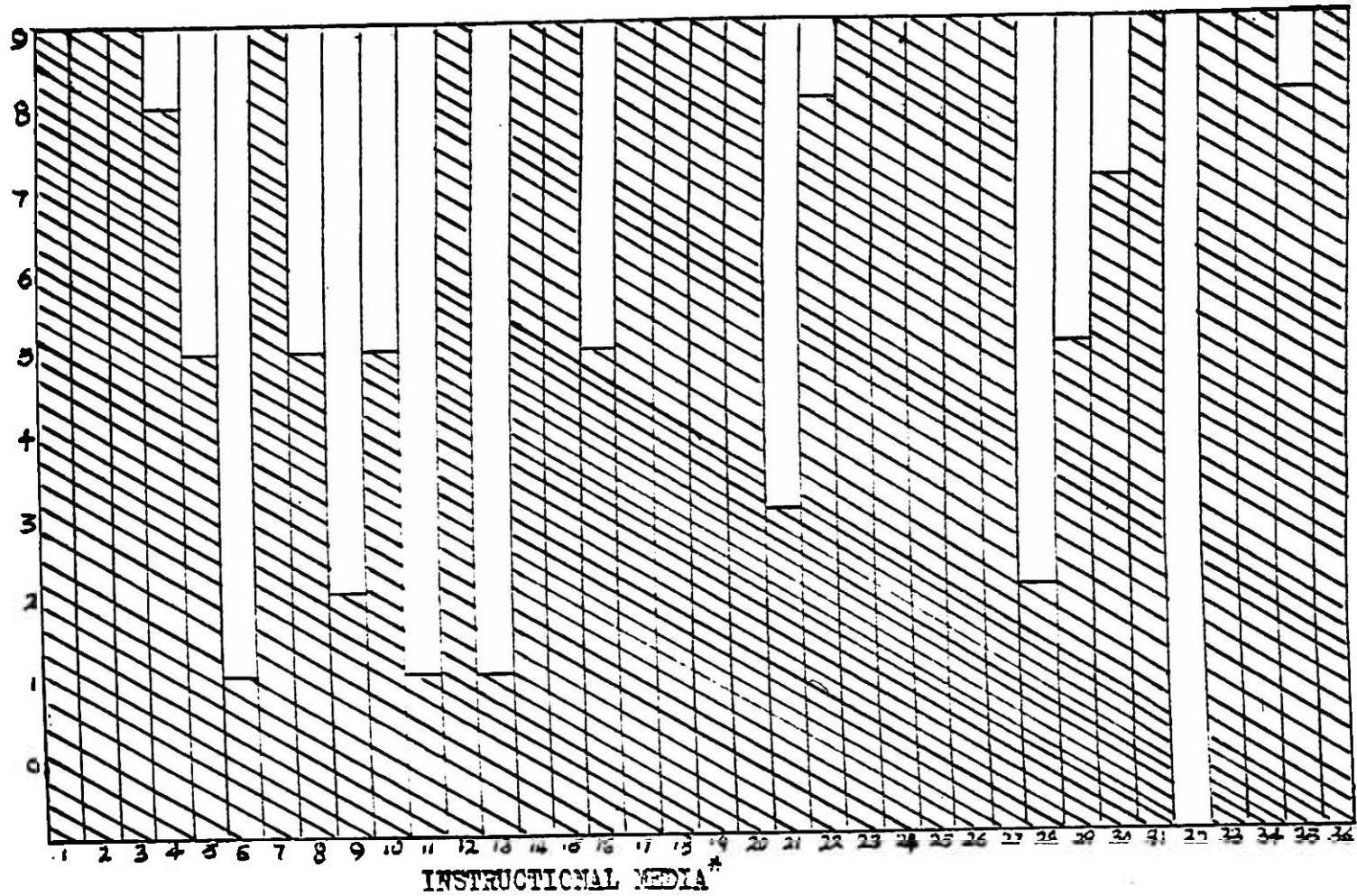


FIG. 6: Urban Primary schools - Eldoret Municipal Council

* Appendix A (Item 1.)

The picture presented by these (figs. 5 and 6) two block-graphs is not a pleasant one. It is clear that there is significant difference between rural and urban primary schools with respect to the use and availability of instructional media. The implication of this disparity is that teachers and pupils in schools in the rural environment have a limited area of experience as the education Columnist, Kul Bhushan³⁶ once pointed out in the Daily Nation. * This difference in the use and availability of media is further evidenced in the Certificate of Primary Education (C.P.E.). However, this disparity exists even among the rural schools themselves. It would not therefore, be surprising to read in newspapers that the best results were obtained in a Nairobi, Eldoret, Kisumu, Bungoma or Nakuru primary school. Nevertheless, it is opportune to point out that the available instructional media in our primary schools are somewhat inadequate. The fact that an average of forty-six (46) per cent of the instructional media are at present available primary schools is in itself sad revelation. Further, an examination of the list media available in schools carries the same story of class discussions, chalk-boards, text-books, manila and sugar papers, displays and wall-charts, and the teacher-made-notes and lectures! How absurd it is to learn that not many of the new media (over-head projectors, over-head transparencies, radios, pianos, educational television and film-

* One of the daily newspapers printed in Kenya

strips) have been introduced in primary school instruction in the Bungoma District and Eldoret Municipal council though these equipment are locally available! Although the above figures show that some of the new media are available in all the schools truth is hidden. The responses of teachers to the question whether they have radios at home and school or none support this observation. Thirty-one (31%) per cent of the urban school teachers and twenty-six (26%) per cent of rural school teachers said that both they and their schools had and used radios as medium of instruction. But sixty-three (63%) and sixty-four point three (64.3%) per cent of the urban and rural school teachers respectively said on the contrary. This finding would seem to confirm the study carried out by Stuart Maclure in England in 1967 in the use of equipment in some of the British Primary schools.³⁷ It would seem that some of the existing equipment is under-utilised. Many teachers complained that whenever the school radios broke down the heads of schools never took them to the District Education Officers' for repairs. Another frequently cited difficulty in connection with the use of radios in teaching was that of time-tabling the schools broadcast service lessons. This was the least expected complaint since the S.B.S. programme is organised and conducted by the Ministry of Education. It is interesting to note that this issue was raised exclusively by some teachers working in urban schools. It would seem that these schools do

not appreciate the role of a radio as an instructional media or just ignore the programme altogether. Alternatively, these are haunted by Certificate of Primary Education (C.P.E.) examination so much that they view the "air" lessons as a hindrance in their examination-oriented primary school instruction. Perhaps the attitudes of teachers towards the radio and other new media accounted for this sort of reaction. It was, therefore, necessary that items on the attitudes of primary school teachers towards the currently used instructional media be included in the questionnaire.

The first item (2) on the attitudes of primary school teachers towards the instructional media required the teachers to indicate, by marking with a tick in the provided boxes, which of the stated instructional media they preferred in their primary school teaching. The preferences included the teacher and/or pupil produced materials. Ministry of Education produced materials, commercially produced materials and others. In the latter preference, the respondents were required to specify their responses. The responses are shown in the following table:

| TYPES OF INSTRUC- TIONAL MEDIA | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|
| Teacher and/or pupil produced materials | 17(13%) | 12(15%) | 17(15%) | 12(12%) | 16(11%) | 13(20%) | 23(14%) | 6(13%) |
| Ministry of Edu- cation produced materials | 20(16%) | 11(13%) | 18(16%) | 13(13%) | 23(16%) | 8(12%) | 23(14%) | 8(17%) |
| Commercially (Educational) produced materials | 5(4%) | 4(5%) | 3(3%) | 6(6%) | 4(3%) | 5(7%) | 6(4%) | 3(6%) |
| Others (Specified) | 82 (63%) | 52(63%) | 71(63%) | 63(64%) | 100(69%) | 34(52%) | 108(66%) | 26(54%) |
| TOTALS | 124(96%) | 79(96%) | 109(96%) | 94(95%) | 143(99%) | 60(91%) | 160(98%) | 43(90%) |

Table 1: Teachers' response distribution to item 2 of the questionnaire.

Contrary to several opinions, teachers used in this survey showed great tendency of preferring a combination of all the three sources of instructional media. That is, teacher and/or pupil produced media, Ministry of Education supplied media, and those media developed and supplied by educational services of commercial concerns like the Brooke Bond Tea Company, East African Airways Corporation and many other private firms. This is evident from table 1 in which sex, experience, environment and professional training do not seem to have influenced the teachers' preference for the various instructional media since in each case more than one half (50%) of the respondents chose this option. However, it is interesting to examine and analyse the reasons given by primary school teachers for their respective preferences. The following tables (2, 3, 4, and 5) present the reasons given by teachers in various categories for their preferences:

| OPINION | MALE | FEMALES | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/q/T |
|---|------|---------|-------|-------|--------|----------|---------|-------|
| Teachers enjoy their own produced media | 7 | 8 | 7 | 8 | 8 | 7 | 10 | 5 |
| Ease of availability and explanation | 7 | 2 | 7 | 2 | 2 | 7 | 7 | 2 |
| Pupils' needs are considered | 2 | 1 | 1 | 2 | 3 | 0 | 3 | 0 |
| No reasons stated for the preference | 1 | 2 | 2 | 1 | 3 | 0 | 3 | 0 |

Table 2: Reasons given by the teachers who opted for the teacher and/or pupil produced media.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPERI. | TRAINED | U/Q/T |
|---|------|--------|-------|-------|--------|-----------|---------|-------|
| Teachers only supplements other sources | 5 | 1 | 2 | 4 | 4 | 2 | 4 | 2 |
| Supply of media is Ministry of Education responsibility | 7 | 6 | 9 | 4 | 10 | 3 | 9 | 4 |
| Ministry of Education media accessible to all teachers | 5 | 4 | 5 | 4 | 6 | 3 | 7 | 2 |
| No reasons stated for the preference | 3 | 0 | 2 | 1 | 3 | 0 | 3 | 0 |

Table 3: Reasons given by the teachers who opted for the Ministry of Education supplied instructional media

| OPINION | FEMALE | MALE | URBAN | RURAL | EXPER. | INEXP. | TRAINED | U/Q/T |
|--|--------|------|-------|-------|--------|--------|---------|-------|
| All these sources are complementary | 34 | 53 | 39 | 48 | 66 | 21 | 70 | 17 |
| Pupils are exposed to a variety of experiences | 3 | 11 | 10 | 4 | 11 | 3 | 11 | 3 |
| Supply of media would be adequate and uniform | 10 | 18 | 15 | 13 | 20 | 8 | 24 | 4 |
| No reasons stated for the preference | 6 | 2 | 8 | 0 | 4 | 4 | 5 | 3 |

Table 5: Reasons given by those teachers who opted for other types of instructional media (Specified)

As shown in table 1, thirty (30) teachers preferred to use the teacher and/or pupils produced instructional media and of these, fifteen (15) said they enjoy their own developed and produced media in primary school teaching; nine (9) teachers said these media are easily available and to use, in addition to their facilitating factual explanations in teaching; three of the teachers said that the needs of learners are given serious consideration when developing these instructional media since the teachers know their pupils better than anyone else. But three (3) other teachers indicated they preferred teacher and/or pupil produced media without giving reasons for doing so.

Thirty-one (31) teachers preferred to use the Ministry of Education supplied instructional media in their primary school teaching. Of these, six (6) teachers said teacher and/or pupil produced media simply complement those from the Ministry of Education; thirteen (13) teachers argued that the development and production of instructional media is the sole responsibility of the Ministry of Education; nine (9) teachers said there would be uniformity and adequate supply of instructional media when the Ministry of Education developed and produced these media, and as in the above preference, three (3) teachers did not give reasons for their choices. Most teachers (134), however, preferred a combination of teacher and/or pupil produced media, Ministry of Education supplied instructional media, and commercially (educational) developed and produced media. Eighty-seven (87) of them said all these sources of media are supplementary, fourteen

(14) said pupils be exposed to a large area of experience, while twenty-eight (28) pointed out that when all these sources developed and produced media, there would be adequate supply of instructional media in primary schools. Surprisingly, eight (8) teachers gave no reasons pfor their preference.

The above discussion does not provide us with any useful information about the characteristics of the members of the sample who gave reasons for their various preferences. In order to do this, it was decided that a 2 x 2 table chi-square (χ^2) statistic be used. Since the entries were small, Yates' correlation was applied. The results of this analysis are presented in the following tables. However, it is important that the reader be acquainted with the lay-out of the tables. In all the four tables, there are three columns namely, the ones headed attributes, calculated results of chi-square (χ^2) and level of significance. Column one comprise the main attributes that might have influenced the teachers in giving reasons for the preference. Column two consists of the results obtained after testing association between the sets of attributes, For example sex and preference. The following tis the summary of the discussion:

From table 6, it would seem there was significant association between men and women, urban and rural, and professionally trained and untrained elementary school teachers. This association was found to be significant at the 50% levels that is 1 in 2. But there was no association between experienced and inexperienced

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | .5430 | P. > 0.50 S |
| Environment | .5430 | P > 0.50 S |
| Experience | 0 | P < 0.95 NS |
| Professional training | .7453 | P. > 0.50 S |

Table 6: Analysis of the reasons given by teacher respondents for preferring teacher produced instructional media

teachers since this was not significant at the 95% level. Hence, teaching experience had influence on the teachers' opinions.

As table 7 shows, there was association between all categories of teachers used in this study. This was significant at the 50% level, that is 1 in 2, in the case of men and women, and urban and rural elementary school teachers. But the association was significant at the 95% level among the experienced and inexperienced, and professionally trained and untrained teachers. Thus, sex, experience, environment and professional training seem to have had no significant influence on the teachers' opinions regarding their options.

However, there was no significant association between men and women, and professionally trained and untrained elementary school teachers. This insignificant association was tested at the 95% level. Hence, sex and professional training did influence the opinions of the teachers who opted for the commercially developed and supplied instructional materials. But there was association among the remaining categories of teachers, that is, urban and rural, and experienced and inexperienced elementary school teachers. This significance was at the 50% level in both cases. Subsequently, the teaching experience and environment of teachers seem to have not influenced the teachers' opinions. This discussion is summarised in the following table.

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | .5980 | P > 0.50 S |
| Environment | .4930 | P > 0.50 S |
| Experience | .0146 | P > 0.96 S |
| Professional training | .0146 | P > 0.95 S |

Table 7: Analysis of opinions expressed by elementary school - teacher who opted for the Ministry of Education developed and supplied instructional materials.

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0 | $P < 0.95$ NS |
| Environment | 0.750 | $P > 0.05$ S |
| Experience | 0.750 | $P > 0.70$ S |
| Professional training | 0 | $P < 0.95$ NS |

Table 8: Analysis of opinions expressed by elementary school teachers who opted for commercially developed and supplied instructional media.

Finally, there was little difference among teacher - respondents who opted for other (specific) types of instructional media and the one just discussed in table 8. That is, there was association between urban and rural school teachers, and experienced and inexperienced teachers though this was at different levels of significance. These were at 0.05 (5%) and 0.70 (70%) respectively. However, there was no apparent association based on sex and professional training when tested at the significance levels of 0.95 (95%) and 0.90 (90%). That is 95 in 100 cases, and 90 in 100 cases respectively. Subsequently, environment and teaching experience did influence the teachers' argument for having opted for 'others' (specified) option. The results are presented in table 9.

Item 4 wanted teachers to indicate who should determine the type of instructional media to be used in the elementary school instruction (see table 10). The results indicate that teachers of all categories felt that both the Ministry of Education and the classroom teacher should collaborate in this difficult work. To be exact, well above sixty-eight (68%) per cent of teachers of this opinion. Details of the results are presented in table 10. However, it is important to note that the response to the remaining options were evenly divided.

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0033 | P < 0.95 NS |
| Environment | 4.8910 | P > 0.05 S |
| Experience | 0.3010 | P > 0.70 S |
| Professional training | 0.0250 | P < 0.90 NS |

Table 9: Analysis of opinions expressed by elementary school teachers who opted for 'Others' (specified) instructional materials to be used in elementary school instruction.

| DETERMINATION OF TEACHING MATERIALS | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|----------|---------|----------|----------|---------|
| Ministry of Education (Kenya) | 18(16%) | 7(9%) | 15(13%) | 13(14%) | 19(13%) | 9(15%) | 19(12%) | 9(20%) |
| Classroom teacher | 18(14%) | 13(16%) | 22(19%) | 9(10%) | 23(16%) | 8(14%) | 26(16%) | 5(11%) |
| Others (Specified) | 89(70%) | 59(68%) | 76(68%) | 102(71%) | 42(71%) | 42(71%) | 118(72%) | 30(69%) |

Table 10: Analysis of the elementary school teachers' choices of options of item 4 of the questionnaire

Opinions expressed by school teacher-respondents for deciding who should determine the type of instructional media to be utilised in elementary school instruction are very important though varied. For example, the teachers who said the Ministry of Education should determine the type of instructional media to be utilised in an elementary school teaching argued that such a practice would ensure uniformity in the development, production and supply of the instructional media not to mention teaching. Further, it was stated that this was actually the responsibility of the Ministry of Education (table 11) and should not be questioned. However, teachers who preferred a classroom teacher said that he is always in contact with his pupils and therefore knows and understands their needs. They also reasonably argued that teachers are the ones who eventually utilise any instructional media that are supplied to schools. Subsequently, they should be involved in the development, production selection and supply of instructional media to elementary schools.

As mentioned above, the bulk of teacher-respondents felt that the collaboration of the classroom teachers and the Ministry of Education's officials in determining the instructional media to be utilised in elementary school instruction is of paramount importance. Teachers thought this would improve the somewhat cold relationship between teachers and their bosses (Ministry of Education Officials). This is likely to happen because the teachers' views would be considered at the development, production, selection and supply stages of instructional media. Thus

completing the systems approach of instructional technology.³⁸ Only two respondents, both women teachers teaching in urban schools, were undecided on who should determine the instructional media to be utilised in elementary school teaching. Funny enough, they did not give reasons for their reaction. Hence making it difficult to speculate their opinions about this particular item.

Details of the above discussion are presented by tables (11, 12, and 13).

The above results were further examined using the chi-square (χ^2) with Yate's correction continuity. The findings are presented in the following tables beginning with those of table 11 down to table 13. As already done elsewhere above, this analysis was to find out whether there was or no association between men and women, urban and rural, experienced and inexperienced, and trained and untrained elementary teachers.

Apparently, there was association between men and women, and experienced and inexperienced elementary school teachers who expressed their opinions for preferring that the Ministry of Education to determine the type of instructional media to be utilised. This association was significant at 80% level, that is 8 in 10. But there was no association between urban and rural, and trained and untrained teachers at the 80% and 95% levels respectively. Hence environment and professional training seem to have had influence on the teachers' opinions regarding the role of the Ministry of Education as the deter-

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|------|--------|-------|-------|--------|----------|---------|-------|
| Uniformity in the teaching and supply of media | 7 | 1 | 6 | 2 | 8 | 0 | 8 | 0 |
| Responsibility of the Ministry of Education | 13 | 4 | 8 | 9 | 8 | 9 | 7 | 10 |
| No reasons stated | 1 | 1 | 0 | 2 | 1 | 1 | 2 | 0 |

Table 11: Analysis of reasons given by elementary school teachers concerning the determination of instructional media by the Ministry of Education.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|---------------------------------|------|--------|-------|-------|--------|----------|---------|-------|
| Teachers know needs of children | 16 | 8 | 17 | 7 | 16 | 8 | 19 | 5 |
| Teachers utilise these media | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 1 |
| No reasons stated | 0 | 3 | 2 | 1 | 2 | 1 | 3 | 0 |

Table 12: Analysis of opinions expressed by elementary school teachers who thought the classroom teacher ought to determine the instructional media to be used in teaching.

minant of the media to be utilised in elementary school teaching.

In the case of the teachers who said the classroom teacher should be sole determinant of the instructional media to be utilised there was significant association between all categories of teachers used in the study. But this association was at different levels of significance namely 0.10 (10%), 0.50 (50%), 0.70 (70%), 0.80 (80%) based on sex, environment, teaching experience and professional training respectively. That is, there was association of 1 in 10 between men and women, 1 in 2 between urban and rural teachers, 7 in 10 between experienced and inexperienced teachers, and 8 in 10 between professionally trained teachers and untrained teachers. Thus all the attributes seem not to have influenced the opinions of teachers in this option. The analysis is presented below in table 15.

Details of the results appearing in table 16 are identical to those presented by table 14. That is, there was association between men and women, experienced and inexperienced, and professionally trained and untrained teachers at the 50%, 90% and 30% levels of significance respectively. But there was no association between urban and rural elementary school teachers at 2% level of significance. That is 1 in 50. Hence, environment had significant influence on the teachers' opinions on the role of both classroom teacher and Ministry of Education

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|---|------|--------|-------|-------|--------|----------|---------|-------|
| Views of teachers would be considered | 24 | 9 | 23 | 10 | 25 | 8 | 31 | 2 |
| Co-operation between teachers and Education Officials would be promoted | 61 | 44 | 46 | 59 | 73 | 32 | 81 | 24 |
| No reasons stated | 5 | 6 | 6 | 5 | 7 | 4 | 7 | 4 |

Table 13: Analysis of opinions expressed by elementary school teachers who thought classroom teacher and Ministry of Education ought to co-operate in the determination of media

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|--------------------------|--------------------------------|--------------------------|
| Sex | 0.0680 | P > 0.80 S |
| Environment | 0.0630 | P < 0.80 NS |
| Experience | 0.1230 | P > 0.80 S |
| Professional training | 0 | P < 0.95 NS |

Table 14: Analysis of opinions expressed by teachers who felt the Ministry of Education should determine the instructional media to be utilised in Elementary school instruction.

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 3.063 | P > 0.10 S |
| Environment | 0.486 | P > 0.50 S |
| Experience | 0.234 | P > 0.70 S |
| Professional training | 0.117 | P > 0.80 S |

Table 15: Analysis of opinions expressed by elementary school teachers who thought the classroom teacher should determine the instructional media to be used in Primary school instruction.

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.911 | P 0.50 S |
| Environment | 5.205 | P 0.02 NS |
| Experience | 0.038 | P 0.90 S |
| Professional training | 1.116 | P 0.30 S |

Table 16: Analysis of opinions expressed by Elementary school teachers who thought classroom teachers and the Ministry of Education should co-operate in this matter.

determining the media to be used in Elementary school teaching.

Items 12 and 13 were included in the questionnaire to further determine the attitudes of elementary school teachers towards various instructional media. In item 12 teachers were supposed to indicate on which of the three aspects of Primary school education the Ministry of Education could spend any extra funds available to it; the three were the teachers' salaries, supply of instructional media to Primary Schools, and improvement of school buildings. The results were quite interesting. Two hundred and seven (207) teachers responded to this item and of these, fifty-three (26%) felt any additional funds should be spent on the salaries of teachers; ninety-nine (48%) said this money should be invested in instructional media, (contrary to all expectations) and fifty-five (27%) suggested any extra fund should go to the improvement of the applying school buildings in elementary schools. The full details of this discussion are clearly summarised in table 17.

A glance at the above table (17) shows that more than forty-five (45%) of elementary school teachers of all categories strongly felt that any extra fund should be used in the development and supply of instructional media in Primary Schools. This is further evidence that teachers realise the important role of media in Primary School instruction and perhaps confirm the fact that the existing supply is agonisingly inadequate. The fact that teachers of all categories should be evenly divided between the remaining two options, salaries of teachers and

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--------------------------------|---------|---------|---------|---------|---------|----------|---------|---------|
| Salaries of teachers | 34(27%) | 19(27%) | 29(26%) | 24(25%) | 36(25%) | 17(27%) | 43(27%) | 10(22%) |
| Supply of instructional media | 58(47%) | 41(50%) | 52(47%) | 47(48%) | 69(48%) | 31(48%) | 81(50%) | 18(40%) |
| Improvement of school building | 32(26%) | 22(23%) | 29(27%) | 26(27%) | 39(27%) | 16(25%) | 38(23%) | 17(38%) |

Table 17: Analysis of options as indicated by elementary school teachers on item 12 (see Appendix A)

improvement of school buildings, by over twenty per cent (20%) reveals the dilemma in which the respondents found themselves. It is, however, no secret that most of our Elementary Schools, especially those in the rural areas, have poorly designed buildings for a teacher trained in modern instructional technology. * As Mr. A. Jengo correctly says, most of these rooms were designed to serve the educational needs for that particular time; they are no longer ideal today. Thus, it does not surprise anyone when twenty-seven (27%) per cent of the urban school teacher and thirty-eight (38%) of untrained teachers suggested that additional funds should go to rennovate and build new classrooms, teachers' houses and secure storage facilities in elementary schools. This would also alleviate the great pressure of classroom shortage brought about by the recently introduced free education from standard I-IV. However, of much surprise is the suggestion by more than twenty-five (25%) per cent of the teachers that any additional money should go to the salaries of teachers. As a matter of fact since the implementation of Ndegwa's Commission of 1972, teachers are among the well paid working people in this country. But as it is always said where money is involved people are quite hypersesitive!

* see the photograph of the rural school.

TYPICAL RURAL PRIMARY SCHOOL - BUNDELA DISTRICT



TYPICAL URBAN PRIMARY SCHOOL - ELDORET MUNICIPAL COUNCIL



| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.1067 | P > 0.80 S |
| Environment | 0.0115 | P < 0.90 NS |
| Experience | 0.0295 | P > 0.90 S |
| Professional training | 3.0044 | P < 0.05 NS |

Table 18: Analysis of elementary school teachers' response distribution among the options of item 12.

Further analysis of the above discussion using the chi-square (χ^2) with Yate's correction to establish the association between the elementary school teachers in various categories who responded to this item shows that there was no association between urban and rural, and professionally trained and untrained teachers at the 0.90 (90%) and 0.05 (5%) levels of significance respectively. Subsequently, sex and professional training seem to have influenced the decision made by elementary school teachers on this item. However, there was association between men and women, and experienced and inexperienced teachers at the 0.80 (80%) and 0.90 (90%) levels of significance. That is 8 in 10 and 9 in 10. Thus sex and teaching experience did not influence the teachers' decisions.

Beside simply indicating their preferences, teachers were also required to state reasons for their respective opinions. The following is but a summary of these reasons given by those teachers who said any additional funds should be spent on the salaries of teachers. Teachers were said to be contributing more than anyone else to nation-building and that any additional money to the present salaries would raise their morale. In addition, it was said teachers were among the lowly paid working people in this country when their role in nation building is considered. As I have mentioned above, this claim is somehow debatable though it could be true when the present rates of inflation is taken into account. The third point was a professional one. Respondents said that with additional money

going to their salaries, teachers could complement the Ministry of Education supplied instructional materials. But again this is a contestable fact. Teachers are bound to say in future that their salaries are not adequate to cover such incidental expenses. Perhaps the most plausible reason was that of using additional funds for the expansion of the existing teacher training facilities to alleviate the existing situation in which unqualified teachers are about to equal trained teachers in number, especially in rural schools. These points are summarised in table 19. As can be clearly seen in table 19, more than forty (40%) per cent of teachers of various categories said teachers contribute alot to nation building. Hence, they should be paid much more than it is the case today. However, it can be stated, without apologies at all, that it is ironical that teachers who prepare people for various professions in the society should be so under-paid. This is quite evident not only in this country but also in such developed nations like the United States of America where many people use teaching profession as a stepping stone to better paid jobs! But since 1974, when the Ndegwa Commission was implemented, teachers' terms of service have become a little bit attractive. The salaries of certain categories of teachers were raised by as much as 50%. This increase has made teaching profession not only a well paid profession but one of promising future for those who are devoted to it.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|----------------------|---------|---------|----------|---------|--------|
| Teachers contribute to nation building | 17(52%) | 11(58%) | 18(62%) | 10(43%) | 19(56%) | 9(50%) | 22(54%) | 6(55%) |
| Teachers are poorly paid | 8(24%) | 6(32%) | 9(31%) | 5(31%) | 8(24%) | 6(33%) | 12(29%) | 2(18%) |
| Expansion of teacher training facilities | 6(18%) | 1(5%) | 1(3 $\frac{1}{2}$ %) | 6(26%) | 5(15%) | 2(11%) | 5(12%) | 2(18%) |
| No reasons stated | 2(6%) | 1(5%) | 1(3 $\frac{1}{2}$ %) | 2(9%) | 2(5%) | 1(6%) | 2(5%) | 2(5%) |

Table 19: Analysis of opinions expressed by teachers who said any additional money be spent on the teachers' salaries

In the case of expanding the existing teacher training facilities to train more teachers it can be said that this requirement is overdue when the aspect of free elementary school education is considered. There is evidence of understaffing in most rural schools. In other words, there are not enough trained teachers to offset the existing shortage. The fact that there are over ten thousand unqualified teachers (18,000) in the country confirms this statement. But go to the relevant authorities in the Teachers Service Commission you will be told Bungoma or any other district is over-staffed. The fact is that these schools are over-staffed with unqualified teachers! Therefore, it does not come as a surprise to anyone when twenty-six (26%) per cent of the rural school teachers suggested that any additional funds be used in the training and recruitment of elementary school teachers. In a sharp contrast, only three and half (3½%) per cent felt this money be invested in the recruitment of teachers. This was expected because most of the urban schools are better staffed with qualified teachers, let alone accommodation for them. In most cases, if these teachers are not housed at these schools, they are usually housed in Estate houses where the Ministry of Education subsidises the house rents.

There were only three cases in which respondents indicated that any additional money be allocated to teachers' salaries but gave no reasons for their opinion. This makes it difficult to guess why they preferred this option. Now, we turn to the discussion about using additional funds to develop, produce and

supply instructional media to schools.

Ninety-seven (46%) of the respondents suggested the additional fund be allocated for the development, production, and supply of instructional media. They placed special emphasis on the relevancy and quality of these media. It was said that some of the media do not have any relevancy to Kenya's educational needs. In addition, their quality was quite poor. Teachers would like to have good quality and easily serviceable teaching equipment and materials. The following is a summary of the main reasons given by those elementary school teachers who preferred this option. It was said more instructional media would be available to teachers since the supply is likely to be adequate. Hence, pupils in elementary schools would have a wide range of experiences making the learning processes enjoyable to them. But it must be noted that this is not likely to happen until the existing system of media supply is re-organised. Generally, teachers felt that the Kenya School Equipment Scheme is inefficient. There were five teachers who did not give reasons for their preference as can be seen in table 20.

As in the preceding discussion, the bulk of responses concentrated on one opinion - any additional fund allocated for the development, production and supply of instructional media would ensure adequate supply of these media. All but one category of teachers indicated that more than forty-five (45%) percent of the respondents felt that additional funds would be used in the development and production of relevant

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| The supply of media would be adequate | 33(56%) | 19(50%) | 37(74%) | 15(32%) | 31(47%) | 21(68%) | 42(55%) | 10(56%) |
| Pupils would have a wide range of experience | 15(25%) | 14(37%) | 3(6%) | 26(55%) | 20(30%) | 9(29%) | 22(28%) | 7(33%) |
| The quality of teaching would be improved | 10(17%) | 1(2%) | 7(14%) | 4(9%) | 10(15%) | 1(3%) | 10(13%) | 1(11%) |
| No reasons stated | 1(2%) | 4(11%) | 3(6%) | 2(4%) | 5(8%) | 0(0%) | 5(6%) | 0(0%) |

Table 20: Analysis of opinions advanced by those elementary school teachers who suggested additional fund be spent on the supply of instructional media.

and quality instructional media for elementary school instruction. Hence, elementary school children would be exposed to a large area of experiences. Again, five (5) teachers did not give reasons for their opinion.

Teachers were not clear in their argument for additional funds to be spent on the improvement of school buildings. The opinions expressed were somewhat general. It was, however, stated that school facilities were lacking and that more elementary schools be established throughout the country to cater for the ever-growing number of school-going age children. These views are schematically shown in table 21.

A glance at table (21) reveals that the majority of teacher-respondents felt there is need to establish permanent tuition buildings and storage facilities. As a matter of fact the state of school buildings in Bungoma, Uasin Gishu and Nandi districts is just appalling as can be seen in the following photographs (1 and 2)*. This point was confirmed during my research tour of these areas between October, 1975 and April, 1976. It was common-place to come across ramshackle tuition blocks or none at all. In most of the rural schools visited children in Lower Primary classes were found huddled under the trees in the school compounds. Teachers were somehow irrational to suggest that more schools be established. A more plausible opinion is to expand or rennovate the existing facilities to accomodate the upsurge of school population and the new media being introduced in teaching profession.

* See appendix B

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| School facilities are lacking/inadequate | 25(76%) | 15(68%) | 22(76%) | 18(69%) | 27(73%) | 13(72%) | 26(74%) | 14(70%) |
| More schools be established in Kenya | 6(18%) | 6(18%) | 7(24%) | 5(19%) | 8(22%) | 4(22%) | 7(20%) | 5(25%) |
| No reasons stated | 2(6%) | 1(5%) | 0(0%) | 3(12%) | 2(5%) | 1(6%) | 2(6%) | 1(5%) |

Table 21: Analysis of opinions expressed by elementary school teachers who suggested additional funds be spent on the improvement of school buildings.

Now we turn to the discussion on the association among the various categories of teachers who responded to this item. The details of the analysis are presented in the following three tables (22 - 24). The first discussion is on the results of the analysis of opinions expressed by elementary school teachers who felt any additional fund be allocated for teachers' salaries. From table 22, it can be clearly seen that both sex and professional training had no influence on the teachers' opinions for preferring the option that additional fund be spent on the salaries of teachers. The association between men and women, and professionally trained and untrained teachers was at 0.90 (90%) and 0.80 (80%) levels of significance respectively. That is 9 in 10, and 8 in 10. However, environment and experience appear to have influenced the teachers' opinions at 0.20 (20%) and 0.90 (90%) levels respectively. See table 22.

But the picture presented by table 23 is slightly different from the one just discussed. In this particular analysis, it was found that environment, experience and professional training did not influence the opinions of teachers who decided that additional money should be spent on instructional media. The association between urban and rural, experienced and inexperienced, and professionally trained and untrained elementary school teachers was at 0.01 (1%), 0.10 (10%) and 0.95 (95%) levels respectively. However, sex was found to have had significant influence on this particular decision. That is, there was no

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0242 | P > 0.20 S |
| Environment | 1.1144 | P < 0.20 NS |
| Experience | 0.0126 | P < 0.90 NS |
| Professional training | 0.0830 | P > 0.80 S |

Table 22: Analysis of opinions expressed by elementary school teachers who thought additional funds be allocated for the salaries of teachers.

significant association between men and woman elementary school teachers at 0.70 (70%) level. The results are outlined in table 23 below.

There was, however, significant association between men and women, and experienced and inexperienced elementary school teachers at 0.80 (80%) level. It would seem, therefore, that sex and experience did not influence the opinions of teachers who argued for additional funds to go to the improvement school buildings. Nevertheless, there was no association between urban and rural, and professionally trained and untrained elementary school teachers at 0.80 (80%) and 0.95 (95%) levels of significance respectively. That is 80 in 100 and 95 in 100 were influenced by sex and professional training respectively. The results are presented in table 24.

Item 13 was supposed to gauge the attitude of teachers towards the suggestion that they use part of their salaries to buy some instructional media necessary in elementary school teaching. Teachers were required to indicate whether they would agree with the suggestion or not. Two hundred and six (206) men and fifty-eight (58) women, eight-seven (87) urban and seventy-seven (77), one hundred and twenty (120) and forty-four (44), one hundred thirty-one (131) trained and thirty-three (33) untrained elementary school teachers utterly rejected the suggestion. That is more than seventy (70) of the respondents did not agree with this suggestion. This proves beyond any doubt that teachers do not think the supply of media is their duty. It would seem that colleges of teacher

| ATTRIBUTES | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.1320 | P < 0.70 NS |
| Environment | 15.6029 | P > 0.01 S |
| Experience | 2.8540 | P > 0.10 S |
| Professional training | 0.0058 | P > 0.95 S |

Table 23: Analysis of opinions expressed by elementary school teachers who felt additional funds be spent on instructional media.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0995 | P 0.80 > S |
| Environment | 0.0615 | P 0.80 < NS |
| Experience | 0.0697 | P 0.80 > S |
| Professional training | 0.0008 | P 0.95 < NS |

Table 24: Analysis of reasons given by elementary school teachers who preferred the option of additional funds going to improvement of school buildings.

education are not doing much to encourage their products to view instructional media as part and parcel of the teaching profession. Generally, they are ill-prepared in instructional technology. That a department or sub-department of communications and instructional technology be established in all the seventeen (17) colleges of teacher education is somewhat overdue. Such innovation could go a long way to change the attitude of teachers towards the development, production and supply of elementary school instructional media. Special emphasis would be placed on the role of teachers in instructional technology. Seminars and educational workshops on instructional technology be conducted by educational technologists from the Ministry of Education, Kenya Institute of Education, University of the professionally qualified, practising teachers. These two innovations would make teachers to hold instructional media in high esteem rather than viewing as mere "aids" in teaching. Table 25 provides the details of the responses of teachers to this item.

It is now clear that teachers would not entertain any suggestion that they buy any instructional media to supplement the Ministry of Education's supply. They objected to the suggestion on the ground that their earnings are inadequate and that the Ministry of Education ought to supply the necessary media. Others were frank enough to argue that this has not been the practice in this country and if anyone ventures to initiate it, there would be exodus of teachers leaving the teaching profession. This argument is true since most of the practising teachers are ill-equipped in the

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/q/T |
|--------------|----------|---------|---------|---------|----------|----------|----------|---------|
| Agree | 12(10%) | 16(20%) | 18(16%) | 10(11%) | 17(12%) | 11(18%) | 19(12%) | 9(20%) |
| Do not agree | 106(85%) | 58(71%) | 87(77%) | 77(82%) | 120(83%) | 44(71%) | 131(81%) | 33(72%) |
| Not decided | 7(5%) | 8(9%) | 8(7%) | 7(7%) | 8(5%) | 7(11%) | 11(7%) | 4(8%) |

Table 25: Analysis of response distribution among the three options of item 13 of the questionnaire.

psychology of instructional technology. No one has told them to sacrifice for the sake of their profession under certain circumstances. In any case, since practice are acquired they can as well be modified or dropped altogether should they be found to be obsolete. A few teachers indicated they were not decided over this issue because it was such an important matter that it needed the consensus opinion of all practising teachers through committees or the Kenya National Union of Teachers (KNUT)

In the case of those teachers who agreed with the suggestion they said this was an integral part of the teaching profession which every practising teacher was expected to do. They further argued that if this practice were to become vigorous all elementary schools could eventually have adequate supply of instructional media. This would alleviate the problem of teacher-classroom shortages that the country is experiencing today. However, there is a likelihood of wide disparity in the available instructional media in schools and in most cases resulting in duplication of these media. Since the Ministry of Education would not know which media are available in what school(s). These facts are summarised in table 26.

The response-distribution presented in table 26 is slightly different from all those observed elsewhere above. There is ^{no} anyone opinion with extreme responses. For example, only four men (33%) teachers said teachers should use part of their salaries to purchase the necessary media in order to alleviate

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|--------|--------|--------|--------|--------|----------|---------|--------|
| Teachers ought to sacrifice | 3(25%) | 5(34%) | 7(39%) | 1(11%) | 4(27%) | 4(40%) | 4(21%) | 4(50%) |
| Complement the Ministry of Education | 3(25%) | 6(40%) | 5(28%) | 4(44%) | 4(27%) | 5(50%) | 6(32%) | 3(38%) |
| Alleviate the teacher classroom shortage | 4(33%) | 2(13%) | 5(28%) | 1(11%) | 5(29%) | 1(10%) | 5(26%) | 1(12%) |
| No opinion stated | 2(17%) | 2(13%) | 1(5%) | 3(34%) | 4(27%) | 0(0%) | 4(21%) | 0(0%) |

Table 26: Analysis of opinions expressed by elementary school teachers who agreed with the suggestion that teachers use part of their salaries to purchase the necessary instructional media in teaching.

the critical problem of teacher-classroom shortage posed by the Presidential decree of the free education for Lower Primary School classes; six (40%) women teachers thought teachers ought to complement the supply of Ministry of education; seven (39%) urban school teachers felt this was an integral part of the teaching profession which should not have been discussed at all; four (44%) rural school teachers and five (50%) inexperienced (U/O/T) suggested that teachers have to supplement the supply of the Ministry of Education. What we see is a fluctuation of response distribution. However, these results compare favourably with those presented in table 3.

We now turn to the disoussion about the association between the four categories (attributes) of teachers who contributed to the above opinions. From the analysis, the following facts arise. Sex and professional training seem to have not influenced teachers in the two categories of elementary school teachers in their decision that teachers contribute towards the purchase of instructional media. The association between men and women and professionally trained and untrained elementary school teachers was significant at 0.90 (90%) and 0.80 (80%) levels. But environment and experience seem to have influenced the teachers' opinions. As shown in table 27, the association between urban and rural school teachers, and experienced and inexperienced elementary school teachers was not significant at 0.05 (5%) and 0.80 (80%) levels.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0534 | P > 0.90 S |
| Environment | 3.1339 | P < 0.05 NS |
| Experience | 0.0630 | P < 0.80 NS |
| Professional training | 0.0881 | P > 0.80 S |

Table 27: Analysis of opinions expressed by elementary school teachers who decided that teachers should contribute towards the purchase of necessary instructional media.

Table 28 shows the main points of argument advanced by teachers who said teachers should contribute towards the purchase of instructional media necessary in elementary school instruction. However, it is important to note how less inter-related these opinions are. They range from the claim that this has not been the practice in this country, no meddling with the salaries of teachers, and teachers being unable to afford the media to teachers being frequently transferred. All these points are debatable. To claim that this has not been the practice is to endorse the view that traditions, whether good or bad, should not be tampered with. In any case, if this line of thinking were accepted, there would not be any development in all aspects of education. It would encourage, if anything, convergent thinking among the youths of today. But if we have to deal with some of the serious problems, facing mankind divergent thinking has to be accepted.⁴⁰ It is my contention that there has to be a beginning to something, that is, divergent thinking has to be accepted if we have to tap all the talents of our local people.

The argument that nobody is to meddle with teachers' salaries does not arise at all. No where in this study has there been any suggestion that teachers be compelled to contribute. Perhaps this was a misconception of the main theme of this item. Contribution (voluntary) can not be equated with compulsion, at all!

Some teachers claimed that teachers can not afford the instructional media necessary in elementary school instruction.

Perhaps this was true considering the time when the questionnaire was administered. The nation (Kenya) had just started experiencing the bitter pinch of the world-wide inflation. Teachers' reaction must have been influenced by this experience at least. Whatever may be argument, teachers must be prepared to buy some of the simple instructional media. Still on this crucial discussion, it was said that teachers are frequently transferred. Hence the instructional media purchased by teachers could not be utilised well since they would always be on the move. This claim was utterly refuted by Mr. Choge, the Assistant Minister of Education in Parliament on the 22nd July, 1976.⁴¹ Knut has successfully negotiated for elementary school teachers to teach in schools in their neighbourhood except in special cases where transfer is effected. Table 28 summarises the above argument.

Statistical analysis shows that there was significant association between urban and rural, experienced and inexperienced, professionally trained and untrained (U/Q/T) elementary school teachers at 0.01 (1%), 0.90 (90%) and 0.95 (95%) levels of significance respectively. That is, opinions expressed by teachers were in no way influenced by the teaching experience, environment and professional training of the teachers. However, sex had influence on the teachers' opinion at 0.50 (50%) level. That is, there was association between men and women elementary school teachers. Table 29 presents the details of the analysis.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| This has not been the practice in this country | 79(72%) | 39(66%) | 52(60%) | 66(80%) | 84(71%) | 34(68%) | 92(70%) | 26(70%) |
| No meddling with salaries of teachers | 18(16%) | 11(18%) | 20(23%) | 9(11%) | 19(16%) | 10(20%) | 21(16%) | 8(22%) |
| Teachers are not able to afford the media | 7(6%) | 2(4%) | 9(10%) | 0(0%) | 7(6%) | 2(4%) | 9(7%) | 0(0%) |
| Teachers are frequently transferred | 3(3%) | 1(2%) | 0(0%) | 4(5%) | 2(1%) | 2(4%) | 3(2%) | 1(3%) |
| No reasons stated | 3(3%) | 6(10%) | 6(7%) | 3(4%) | 7(6%) | 2(4%) | 7(5%) | 2(5%) |

Table 28: Analysis of response distribution among the five opinions expressed by elementary school teachers who did not agree with the suggestion that teachers use part of their purchase media.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.3552 | P < 0.50 NS |
| Environment | 7.4110 | P > 0.01 S |
| Experience | 0.0228 | P > 0.90 S |
| Professional training | 0.0094 | P > 0.95 S |

Table 29: Analysis of opinions expressed by elementary school teachers who did not agree with the suggestion that teachers use part of their salaries to buy the necessary instructional media in elementary school instruction.

Besides analysing the opinions expressed by elementary school on specific options (agree or do not agree), there was an attempt to do the same for the response distribution among the three options namely, agree, do not agree and not decided (no opinion). The analysis shows there was significant association between men and women teachers who responded to this item (13) at the 0.05 (5%) level. That is 1 in 20 teachers were not influenced in their argument by the sex attribute. The association between professionally trained and untrained elementary school teachers was found to be at 0.50 (50%) level. But environment and teaching experience seem to have not influenced the teachers opinions when tested at the 0.50 (50%) and 0.10 (10%) respectively. The following table outlines the result.

In addition to examining the teachers' attitudes towards the available instructional media, it became increasingly necessary to assess, generally, utilisation of these media by teachers as well. In order to do this, a few items on this aspect of instructional technology were included in the questionnaire. But before the discussion commences it must be noted that the treatment of these items (5, 10, 7) has followed the same pattern used above, that is, item by item analysis.

The first to be discussed required teachers to indicate how often they use local resources (field trips, people, specimens, etc.) in their elementary school teaching. There is a lot of talk about utilising these media in teaching.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 7.4727 | P > 0.05 S |
| Environment | 1.2150 | P < 0.50 NS |
| Experience | 3.8894 | P < 0.10 NS |
| Professional training | 2.2131 | P > 0.50 S |

Table 30: Analysis of the response distribution among the three options of item 13.

Politicians as well as educators keep on appealing to teachers to ensure that this is implemented.

The majority of teachers said they only 'sometimes' utilise local resources in their teaching. This was so because of two main reasons. First, it was claimed that local resources are not easy to obtain and integrate in the learning/teaching units. Two, the use of local resources in elementary school teaching is to a great extent determined by the subject matter to be taught. But both of these reasons point to one of the many weaknesses in the training of teachers in this country. Teachers are not just creative enough to overcome the said difficulties. College of teach education should treat this finding as a great challenge to them. At the moment there is no sufficient evidence that these institutions prepare their products for creative teaching or divergent thinking. There is insistence on following the established traditions in teacher education. There is, however, need to re-examine the role of some of these traditions in view of the numerous innovations that are developing in instructional technology. It does not matter at what cost but our teachers should be trained to creatively utilise local resources in teaching. School children would appreciate education more than they do at present if the learning was based on local resources.

Among the opinions expressed by teachers who said they 'always' utilise local resources were that these media are

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|-----------|---------|---------|---------|----------|----------|----------|----------|---------|
| Always | 17(13%) | 10(12%) | 16(14%) | 11(11½%) | 19(13%) | 8(13%) | 22(13%) | 5(10½%) |
| Sometimes | 95(74%) | 66(80%) | 86(76%) | 75(77%) | 111(77%) | 49(77%) | 124(76%) | 37(79%) |
| Never | 16(13%) | 6(8%) | 11(10%) | 11(11½%) | 15(10%) | 7(10%) | 17(11%) | 5(10½%) |

Table 31: Analysis of response distribution among the three options of item 5 of the questionnaire.

easily available and that they are available in a wide range providing teachers as well as school children with a variety of experiences. Against all odds, it appears that local resources have a bright future in elementary school instruction provided they are properly evaluated and recommended by technologists from the University of Nairobi (Faculty of Education) and Kenyatta College. Teachers seem willing to adapt and experiment with local resources. What is lacking today is encouragement from those at the top, especially colleges of teacher education. Authorities concerned with the supply of elementary school instructional media should consider, very seriously, the role of local resources in teaching. These should be specified in the syllabi where necessary. To achieve this aspiration would mean harnessing the talents of all those interested in elementary school education. After all, most innovations in education in recent years have evolved in areas where local communities show keen interest or accept the changes. In this case elementary school teachers should be educated in the use of local resources in teaching either through pre-service or in-service training. Without taking into account such an approach even internationally accepted media would not be implemented in teaching in this country.

Teachers who said they 'never' use local resources in their elementary school teaching argued, among other things,

that there is no finance and proper planning to back the utilisation of these media, and that teachers are not aware of such a practice. But both of these points can easily be refuted. The first point need not have arisen at all. What is needed is mutual co-operation between the practising teachers, instructional technologists, and the Ministry of Education. Representatives of these bodies could develop methods of finding out which local resources is effective in the teaching of what subject - matter. One way would be through essay writing open to the public though priority given to practising teachers to describe various local resources and their role in elementary school teaching. Dr. Eshiwani is doing this in an attempt to develop local (mathematics) instructional media.⁴² Another venue would be through workshops or conferences where the participants could discuss the benefits and limitations of some of the local resources in elementary school teaching. Instructional technologists from the Ministry of Education, the University, Colleges of teacher education and primary school teachers would be among the participants. Comments about the proceedings would be noted, discussed thoroughly, and then recommendations made later. These could reach all the teachers through a relevant journal or magazine circulated to all the elementary schools. Hence, instructional media would be generally publicised. Table 31 presents distribution of responses among the three options (see above).

As is the case elsewhere above, there was need to test the

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 1.5800 | P < 0.30 NS |
| Environment | 0.4600 | P < 0.70 S |
| Experience | 0.0263 | P < 0.95 S |
| Professional training | 0.2080 | P < 0.90 S |

Table 32: Analysis of response distribution among the three options of item 5.

association between sets of categories of teachers who responded to this item (13). The analysis shows there was not significant association between men and women, urban and rural, experienced and inexperienced, and professionally trained and untrained elementary school teachers at the 0.30 (30%), 0.70 (70%), 0.95 (95%), and 0.90 (90%) levels of significance respectively. That is sex, environment, teaching experience, and professional training seem to have had influence on the teachers' responses to this item. The analysis is presented in table 32.

Further analysis was done in the distribution of reasons given by elementary school teachers for preferring any one of the three options (always, sometimes or never). There was significant association between men and women, and experienced and inexperienced elementary school teachers at (90%) 0.90 and 0.70 (70%) levels respectively. Thus sex and teaching experience had no influence on the teachers' opinions for utilising local resources always in teaching. On the other hand, there was no association between professionally trained and untrained, and urban and rural school teachers at (70%) 0.70 and (20%) and 0.20 levels respectively. That is environment and professional training influenced the teachers' arguments or opinions on the option. See table 33.

In the case of the teachers who said they use local resources only 'sometimes' the analysis showed that there was significant

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0411 | P > 0.90 S |
| Environment | 1.6300 | P < 0.20 NS |
| EXPERIENCE | 0.1633 | P > 0.70 S |
| Professional training | 0.1303 | P < 0.70 NS |

Table 33: Analysis of the opinions expressed by elementary school teachers who said they 'always' use local resources in teaching.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 6.2100 | P > 0.02 S |
| Environment | 2.6506 | P > 0.20 " |
| Experience | 0.2416 | P > 0.70 " |
| Professional training | 0.0243 | P > 0.90 " |

Table 34: Analysis of opinions expressed by elementary school teachers who said they use local resources only 'sometimes'.

association between men and women, urban and rural, experienced and inexperienced, and professionally trained and untrained elementary school teachers. Apparently, all these sets of attributes did not influence the opinions of teachers on this particular option. Full results are contained in table 34.

The responses of elementary school teachers who said they 'never' utilise local resources in their teaching was unexpected. It was expected that the majority of teachers would indicate so. But as it turned out, just a few of them in fact did so. Generally, many elementary school teachers, especially those teaching in rural schools, are less inclined to utilise local resources in their teaching for organisational and financial reasons. Overshadowing this argument is the feeling by teachers that the use of such resources is not only below their dignity but also cumbersome. Whatever is the case, many teachers simply avoid doing this because local resources require creative abilities which they do not, regrettably, bother to demonstrate.

Using the chi-square analysis, significant association between men and women, urban and rural, experienced and inexperienced, and professionally trained and untrained elementary school teachers was established at 0.30 (30%), 0.50 (50%), 0.80 (80%) levels respectively. That is, sex, environment, teaching experience, and professional training had no influence on the opinions expressed by teachers who said they 'never' use local resources in teaching. Table 35 summarises

| ATTITUDE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 1.4680 | P > 0.30 S |
| Environment | 0.8082 | P > 0.50 " |
| Experience | 0.0856 | P > 0.80 " |
| Professional training | 0.0934 | P > 0.80 " |

Table 35: Analysis of opinions expressed by elementary school teachers who opted for 'never' local resources in teaching.

these views.

Before we end the discussion on local resources, it is necessary that we examine the opinions raised by elementary school teachers of all categories who responded to this item. Although these reasons have been discussed above, it would be useful to present them schematically. The following three tables are devoted to this.

Our next discussion is item 10. Teachers required to indicate how often they use radio-broadcast to schools in their elementary school teaching-regularly, sometimes or never. Distribution of responses among these three options is presented in table 39.

It is evident that the most popular option was 'sometimes'. More than one half (57%) of teachers of all categories, (with the exception of urban teachers) said they utilise radio broadcasts in teaching only 'sometimes'. It is interesting to note that rural school teachers recorded highest (74%) while urban school teachers least (39%) in responding to this particular option. The same difference between urban (40%) and rural (21%) school teachers is to be found in the response to option one - 'regularly'. Perhaps this difference is because urban school teachers are supervised regularly by their respective educational administrators. But the contrary obtains in rural schools. It could be also because radios are easily repaired whenever they breakdown in urban schools whereas in rural schools it takes a long time to have this done. It is somewhat difficult

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--------------------------------------|---------|--------|--------|--------|---------|----------|---------|--------|
| There is a wide range of materials | 11(61%) | 6(67%) | 8(50%) | 9(82%) | 12(63%) | 5(63%) | 13(59%) | 4(80%) |
| Local Resources are easily available | 5(28%) | 2(22%) | 7(44%) | 0(0%) | 5(26%) | 2(25%) | 7(32%) | 0(0%) |
| No reasons stated | 2(11%) | 1(11%) | 1(6%) | 2(18%) | 2(11%) | 1(12%) | 2(9%) | 1(20%) |

Table 36: Analysis of opinions expressed by elementary school teachers who said they 'always' use local resources in teaching.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| Difficult to obtain and use local resources | 22(23%) | 18(28%) | 23(27%) | 17(28%) | 27(24%) | 13(26%) | 29(23%) | 11(30%) |
| Subject-matter determines the use of local resources | 63(65%) | 28(44%) | 43(50%) | 48(64%) | 64(58%) | 27(54%) | 70(56%) | 21(57%) |
| Teachers ignore local resources | 4(4%) | 5(8%) | 6(7%) | 3(4%) | 7(6%) | 2(4%) | 8(6%) | 1(2%) |
| No reasons stated | 8(8%) | 13(20%) | 14(16%) | 7(9%) | 13(12%) | 8(16%) | 17(15%) | 4(11%) |

Table 37: Analysis of opinions expressed by elementary school teachers who said they utilise local resources in teaching only 'sometimes'.

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAI | U/Q/T |
|--|--------|--------|--------|--------|--------|----------|--------|----------|
| Lack of finance and planning | 5(33%) | 5(72%) | 7(58%) | 3(30%) | 7(47%) | 3(43%) | 8(50%) | 2(33.3%) |
| Teachers are ignorant of this practice | 4(27%) | 1(14%) | 1(9%) | 4(40%) | 4(26%) | 1(14%) | 3(19%) | 2(33.3%) |
| No reasons stated | 6(40%) | 1(14%) | 4(33%) | 3(30%) | 4(26%) | 3(43%) | 5(43%) | 2(33.3%) |

Table 38: Analysis of opinions expressed by elementary school teachers who said they 'never' utilise local resources.

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/q/T |
|-----------|---------|---------|---------|---------|---------|----------|---------|---------|
| Regularly | 45(36%) | 20(24%) | 45(40%) | 20(21%) | 48(33%) | 17(27%) | 55(34%) | 10(22%) |
| Sometimes | 72(58%) | 42(51%) | 44(39%) | 70(74%) | 79(55%) | 35(57%) | 83(51%) | 31(69%) |
| Never | 7(6%) | 21(25%) | 23(21%) | 5(5%) | 18(12%) | 10(16%) | 24(15%) | 4(9%) |

Table 39: Analysis of the response distribution among the three options of item 10^{*} of the questionnaires.

* See appendix

to explain why a high percentage of women (25%) and urban (21%) school teachers said they never use radio broadcasts to schools. However, one is left to guess that most of these respondents teach in standards I-II, classes which do not take "air" lessons. Examination of reasons given by various teachers who responded to these options might guide use in explaining this phenomenon.

In the case of teachers who said they use "air" lessons regularly this was because the schools broadcast services had determined how many lessons are taught per week, and that there are frequent breakdown in the radio receptions. Further, it was said other instructional media were available in the schools. Thus, the latter reason, more than any other, explains why a large percentage (21%) of urban school teacher do not use radio broadcasts with the same frequency as their rural counter-parts. This confirms the findings of item one discussed at the beginning of this chapter where it was found that rural schools had, relatively, inadequate supply of instructional media when compared with urban schools. Consequently, urban school teachers have alternative media to use in elementary school teaching to radio lessons. The situation is worsened by the fact that urban school teachers and a few rural school teachers concentrate very much on preparing their pupils for the Certificate of Primary Education (C.P.E.) at the expense of quality instruction. Table 40 presents distribution of responses among the three reasons

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| "Air" lessons are limited | 41(56%) | 26(67%) | 29(66%) | 38(56%) | 47(62%) | 20(56%) | 47(57%) | 20(61%) |
| Frequent radio breakdowns in reception | 24(33%) | 9(23%) | 7(16%) | 26(38%) | 22(29%) | 11(31%) | 26(32%) | 7(23%) |
| Other media are available | 5(7%) | 1(2%) | 5(11%) | 1(2%) | 4(5%) | 2(5%) | 6(7%) | 0(0%) |
| No reasons stated | 3(4%) | 3(8%) | 3(7%) | 3(4%) | 3(4%) | 3(8%) | 3(4%) | 3(10%) |

Table 40: Opinions expressed by elementary school teachers who said they only 'sometimes' use radio-broadcasts to schools in teaching.

given by elementary school teacher for saying they 'sometimes' use radio broadcasts in their teaching.

In the above table (40) it can be seen that more than one half (50%) said 'air' lessons are limited to three or four lessons per week. Perhaps they would have used these regularly if only this limit was not set. However, it was necessary that such an important innovation in elementary school instruction be cautiously organised and conducted so. After all, the Ministry of Information and Broadcasting has its own programmes to be 'cast' in the interest of the public. It is my contention that the present arrangement is satisfactory so long as the teachers co-operate with the operators of 'air' lessons by religiously following the programme schedules circulated, free of charge, to all the schools in the country.

Using the chi-square analysis of the above discussion to establish whether the opinions occur by chance or not, it was found that there was significant association between men and women elementary school teachers at (30%) 0.30 level. Hence, sex did not influence teachers' responses to this option. However, there was no association between urban and rural, experienced and inexperienced, and professionally trained and untrained teachers at 0.30 (30%) and 0.50 (50%) levels respectively. Thus, environment, teaching experience and professional training appear to have influenced the teachers in their argument for using ~~radio-broadcasts~~ to schools in teaching only 'sometimes'. The results are presented in table 41.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 1.1435 | P > 0.30 S |
| Environment | 0.7392 | P < 0.30 NS |
| Professional training | 0.4061 | P < 0.50 " |
| Experience | 0.1827 | P < 0.50 " |

Table 41: Analysis of opinions expressed by elementary school teachers for using radio-broadcast to school only 'sometimes'.

It was surprising that not many elementary school teachers indicated that they 'regularly' use radio broadcasts to schools in teaching. This programme was designed and is being conducted by the Ministry of Education. Thus, all elementary schools are expected to actively participate in it since termly programme schedules and notes for the teachers are circulated to all schools in the country. In addition, radios have, since 1967 been distributed to all these schools though only thirty-one (31%) percent of the urban school teachers, and twenty-six (26%) percent of the rural school teachers said their schools have radios. Figures 6 shows that all the schools in the target areas (Bun goma and Municipality of Eldoret) have this equipment. If this response is representative of what is actually happening in elementary schools, then the conclusion is anyone's guess. Something is wrong with the design and supply of this item, and the S.B.S. staff should investigate into this disturbing problem in attempt to correct it before it becomes unsurmountable. If radio receptions frequently breakdown then the Ministry of Education should be urged to supply quality radios to schools. School committees could also be asked to assist in this situation by conducting fund-raising meetings to buy radios for their respective schools. To ensure full utilisation of radio broadcasts, service personnel to repair spoiled radios be stationed at all the district education office quarters in the country. Teachers, especially, the Heads,

be urged to take their radios for service regularly. They should be urged to use their own radios whenever the school one breaks down.

Examination of the opinions expressed by those teachers who said they 'regularly' use radio broadcasts to schools show that many teachers still do not understand the role of the radio broadcasts to schools in elementary school teaching. For example, some said the S.B.S. (Schools Broadcast Service) unit determines 'air' lessons and that radios are available in all the schools and that these lessons facilitate teaching and teaching processes. This sort of reasoning provokes one to ask the question so what? Nevertheless, these opinions are summarised in table 42.

Let us now work at the analysis of these opinions using a 2 x 2 table of chi-square (χ^2) with Yates' Correction. This analysis shows that there was no significant association between men and women, and urban and rural primary schools teachers at 0.80 (80%) and 0.20 (20%) levels respectively. That is sex and environment influenced the teachers' opinions on this particular option of using radio broadcasts to schools 'regularly'. However, there was association between experienced and inexperienced, and professionally trained and unqualified elementary school teachers in the Bungoma District and Municipality of Eldoret of Western Kenya. The association was significant at 0.20 (20%) levels in both cases. Hence these two sets of attributes of teaching experience and professional training did not influence the teachers' opinions on this same option. Table 43 present

| OPINION | MALE | FEMALE | URBAN | RURAL | WTR. | INWTR. | TRAINED | U/Q/T |
|-----------------------------------|---------|---------|---------|---------|---------|---------|---------|--------|
| S.B.S. determines 'air lessons | 24(51%) | 11(58%) | 21(47%) | 14(67%) | 23(47%) | 12(71%) | 26(48%) | 9(76%) |
| Radios are available to schools | 12(26%) | 5(26%) | 13(29%) | 4(19%) | 16(33%) | 1(5½%) | 16(30%) | 1(8%) |
| 'Air' lessons facilitate learning | 6(13%) | 2(11%) | 5(11%) | 3(14%) | 5(11%) | 3(18%) | 7(13%) | 1(8%) |
| No reasons stated | 5(10%) | 1(5%) | 6(13%) | 0(0%) | 5(10%) | 1(5½%) | 5(9%) | 1(8%) |

Table 42: Opinions expressed by elementary school teachers who opted for 'regularly' using radio broadcasts to schools in teaching.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0537 | P < 0.80 |
| Environment | 1.8638 | P < 0.20 |
| Experience | 1.9740 | P > 0.20 |
| Professional training | 1.9740 | P > 0.20 |

Table 43: Analysis of opinions expressed by elementary school teachers who opted for 'regularly' using radio broadcasts to schools in teaching.

the results of this discussion in summary form.

Equally surprising was the high percentage (14%), on the average, of the teachers who said they 'never' use radio broadcasts to schools in their teaching. Twenty-five (25%) percent of the women and twenty-one (21%) percent of urban teachers said so! This is a shocking revelation and more so when most of the respondents were both trained and experienced teachers. Among the reasons advanced by these teachers for their decision were that radio lessons were poorly conducted and that some schools do not schedule this programme. They also said that some of the schools did not have enough classrooms for all the classes. Thus, school sessions were being conducted in shifts - some classes come to school in the morning and then go away for good in the afternoon. Then the rest of the remaining groups come in the afternoon. Now, let us critically examine these views. The first argument is totally unacceptable since the schools Broadcast Service unit welcomes any suggestion which can contribute to the improvement of the educational radio programmes.⁴³ To say that some schools do not schedule this programme is sacrilegious. The policy is that all the schools MUST use radio broadcasts to schools otherwise there is no point in wasting the precious time, public funds and equipment for this purpose. In the case of those schools which operate in shifts tape recordings should be supplied to them. These have been found to be useful in Tanzania. I was reliably informed that these are available and schools could be supplied with them on request

provided they meet the cost of tapes. The snag is that most primary school teachers are not aware of such a thing or they lack the necessary initiative. In any case, almost all the schools on swifts must have tape-recorders to use. Tanzania has overcome this problem by supplying the same model of tape-recorders to all secondary schools and colleges of national education. The response-distribution among the two opinions just discussed are given in table 44.

The analysis of these opinions shows that there was association between men and women, and professionally trained and untrained elementary school teachers at 0.20 (20%) and 0.70 (70%) levels respectively. That is, sex and professional training did not have influence on the teachers' opinions on 'never' using radio broadcasts to schools. However, environment and teaching experience had influence on the opinions expressed by elementary school teachers at the indicated level of significance. Table 45 presents the details of the analysis.

Item 7 was based on the findings of Maclure's survey of 1967.⁴⁴ In this survey he found that most of the equipment supplied to elementary schools in England were being under-utilised. This item wanted teachers to indicate whether this was the case in their schools or not. But as it turned out, more than one half (50%) of the respondents said it 'never' happens; two-fifths (40%) said 'sometimes', while less than

| OPINION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--------------------------------|--------|--------|---------|--------|--------|----------|---------|--------|
| Schools run on swifts | 6(86%) | 9(41%) | 11(46%) | 4(80%) | 9(54%) | 6(50%) | 12(48%) | 3(75%) |
| 'Air' lessons not scheduled | 0(0%) | 7(32%) | 7(29%) | 0(0%) | 4(23%) | 3(25%) | 6(24%) | 1(25%) |
| No reasons stated | 1(14%) | 6(27%) | 6(25%) | 1(20%) | 4(23%) | 3(25%) | 7(28%) | 0(0%) |

Table 44: Opinions expressed by elementary school teachers who opted for 'never' using radio broadcasts to

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 1.9740 | P > 0.20 S |
| Environment | 0.7779 | P < 0.30 NS |
| Experience | 0.0548 | P < 0.80 " |
| Professional training | 0.1988 | P > 0.70 S |

Table 45: Analysis of opinions expressed by Primary school teachers who said they 'never' use radio broadcasts to schools.

one twentieth (5%) said this is common-place. It would seem, therefore, that our local teachers utilise the few available instructional media more than their counterparts in England. Table 46 presents details of the above discussion.

The analysis of the response distribution among the three options of item 7 shows that there was no association between men and women and urban and rural elementary school teachers at 0.90 (90%) and 0.95 (95%) levels of significance. Hence sex and environment had influence on the teachers' responses to this item. But professional training and teaching experience of the teachers seem to have not influenced the teachers' responses. The latter were tested at 0.30 (30%) level. The summary of the results is presented below.

Item 11, 15 and 16 were developed to assess the current supply of instructional media in elementary schools and the teachers' attitude towards the chalk-board. In item 11 teachers were asked whether they were satisfied with the present supply of teaching materials and equipment in their respective schools. As expected, more than seventy (70%) percent of the teachers of all categories said the supply was definitely inadequate. Teachers blamed the Kenya School Equipment Scheme for the current shortages of the supply of media. It was alleged that urban schools and those located along the roads were better served by this agency than rural, remote elementary schools. It was further said that the instructional media were never supplied in time and that teachers' orders were rarely honoured. Generally, schools in urban areas are better placed with respect

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|-----------|---------|---------|---------|---------|---------|----------|---------|---------|
| Always | 3(2%) | 3(4%) | 3(3%) | 3(3%) | 6(4%) | 0(0%) | 6(4%) | 0(0%) |
| Sometimes | 53(42%) | 33(42%) | 47(42%) | 39(41%) | 56(40%) | 30(40%) | 68(43%) | 18(38%) |
| Never | 70(56%) | 43(54%) | 61(55%) | 52(56%) | 78(55%) | 85(54%) | 84(53%) | 29(62%) |

Table 46: Response distribution among the three options of item 7 of the questionnaire.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.4400 | P < 0.90 NS |
| Environment | 0.0501 | P < 0.95 " |
| Experience | 3.1970 | P > 0.30 S |
| Professional training | 2.4980 | P > 0.30 " |

Table 47: Analysis of response distribution among the three options of item 7.

to the supply of media than rural schools. A number of factors account for this difference. These schools are concentrated in a small area easily accessible to by educational administrators; they have secure storage facilities, and almost all of them are on the (electric) mains. But rural schools, on the contrary, are dispersed, have no storage facilities, and lack of electricity. These facts are clarified by table 48.

The analysis of these responses shows that there was significant association between men and women elementary school teachers and between urban and rural school teachers at 0.01 (1%) and 0.20 (20%) levels. Thus, sex and environment did not influence the teachers' responses to item 11. However, there was no association between experienced and inexperienced, and professionally trained and untrained school teachers at 0.20 (20%) level in both cases. Table 49 presents the results.

Apart from merely responding to item 11, elementary school teachers were required to suggest improvements in respect of their responses. A number of suggestions were made. Among them was that elementary schools be supplied with tape-recordings and tape-recorders for future use. Here is evidence of the teachers' appreciation of the role of these equipment and materials in elementary school teaching. But a number of observations should be made. Service teams to maintain these expensive items should be trained and posted to all districts as technicians if we have to avoid the present less conducive experience with radio broadcasts to schools. Teachers themselves should be trained in the operation of the item and

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|-------------|----------|---------|---------|---------|----------|----------|----------|---------|
| Adequate | 11(9%) | 6(7%) | 9(8%) | 8(9%) | 9(6%) | 8(13%) | 12(8%) | 5(12%) |
| Inadequate | 104(86%) | 58(73%) | 86(78%) | 76(84%) | 115(83%) | 47(76%) | 131(83%) | 31(72%) |
| Not decided | 6(5%) | 15(20%) | 15(14%) | 7(7%) | 15(11%) | 7(11%) | 15(9%) | 7(16%) |

Table 48: Response distribution among the three option of item 11 of the questionnaire

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 10.3863 | P > 0.01 S |
| Environment | 1.8643 | P > 0.20 " |
| Experience | 2.4410 | P > 0.20 NS |
| Professional training | 2.6240 | P > 0.20 " |

Table 49: Analysis of response distribution among the three options of item 11.

secure storage facilities should be provided to ensure that these equipment are kept in the school compound. Perhaps, the establishment of school instructional materials centre under a teacher with technology training is overdue. If this is not possible because of limited skilled manpower then arrangements should be made to organise such centres on zonal basis. Teachers could visit these areas with their pupils or alone for discussion with the directors of the centres or collect some teaching materials and equipment on loan. We actually have such centres in this country in the name of teacher advisory centres. But it would seem many elementary school teachers are not aware of their existence and if they are aware, they hardly visit them. This fact is confirmed by teachers' responses to the question how many times they had been to these centres. More than ninety (90%) percent of the respondents said once or none at all although almost all of them (99%) confirmed these centres are in the neighbourhood of their schools. This indicates that either these centres are poorly organised or poorly maintained as well as understaffed. This discussion is summarised by table 50.

For the teachers who said the supply of instructional media in their elementary schools was inadequate, suggested that the Ministry of Education should invest more money in the development and supply of media. The question is where will this Ministry obtain extra funds to finance such a project when it is already in serious financial difficulties?

| SUGGESTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|---|------|--------|--------|--------|--------|----------|---------|--------|
| Supply tape- recorders | 1 | 0(0%) | 1(11%) | 0(0%) | 1(11%) | 0(0%) | 1(8%) | 0(0%) |
| Set up instructional materials centres | 3 | 4(80%) | 3(33%) | 4(57%) | 3(33%) | 4(57%) | 5(42%) | 2(50%) |
| No suggestion stated | 7 | 1(20%) | 5(56%) | 3(43%) | 5(56%) | 3(43%) | 6(50%) | 2(50%) |

Table 50: Suggestions made by elementary school teachers who said the present supply of instructional media to primary schools is 'adequate'

Perhaps a reduction in the salaries of teachers and other incidental expenditures could help in raising money for this purpose. Beside supplying more media, teachers strongly suggested that these materials and equipment be of good quality. The question of supervision was emphasised by these teachers too. They said educational administrators ought to supervise teachers in the use and storage of media in schools. But the crucial question is, how qualified are these officers in instructional technology to do this type of work? Could teachers welcome such a practice? To find out the truth, item 14 was developed to assess the teachers' attitude towards such a move. More than fifty (54%) percent of the respondents thought these officials are unfit to supervise teachers in the use of various teaching equipment and materials. These teachers were careful not to say all of them are unqualified to do this work. They suggested that all these officers be refreshed occasionally in instructional technology if their supervision has to make any impact to teachers.

Generally, teachers appear to welcome supervision provided the supervisors are well-informed in instructional technology. As pointed out elsewhere, teachers recommended the re-organisation or abolition of the Kenya School Equipment Scheme since its services to schools are unsatisfactory. The unfortunate thing these teachers did was not to indicate an alternative to this

scheme. This information was necessary to educational administrators.

Finally, teachers suggested the establishment of secure storage facilities for the supply of instructional media in all elementary schools, especially those in rural areas. In the latter areas, schools lack stores or secure rooms in which to keep teaching materials. Consequently, these media are damaged by people, animals or weather conditions. These suggestions are summarised below in table 51.

Twenty (20%) teachers were not committed to either of the options already discussed. That is, they were not decided. Of these, thirteen were urban school teachers while the rest were rural teachers. Even though, their suggestions regarding the supply of instructional media did not differ much from those discussed above namely, establishment of secure storage facilities in schools, and supply of more and quality teaching materials. They also proposed establishment of materials centres to equality supply teaching materials to all elementary schools on loan. Two questions arise in this respect: Are our teachers real ready for such innovation? Who should finance these institutions, the Government or foreign sponsors as was the case with the Kenya Primary school inspectorate?

Item 15 and 16 were intended to test the elementary school teachers' attitude towards a chalk-board as an instructional media. The general assumption in this country is that teaching can not be considered complete without the use of this item and chalk. Figures 5 and 6 above confirm this fact. These

| SUGGESTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--|---------|---------|---------|---------|---------|----------|---------|---------|
| Set up materials centre | 15(16%) | 12(17%) | 15(16%) | 12(18%) | 15(24%) | 12(24%) | 19(14%) | 8(24%) |
| Supply and supervise use of media | 22(23%) | 11(15%) | 14(15%) | 19(28%) | 20(16%) | 13(26%) | 22(16%) | 11(33%) |
| Decentralise Kenya School Equipment Scheme | 28(29%) | 23(82%) | 28(31%) | 23(84%) | 41(35%) | 10(20%) | 45(33%) | 6(19%) |
| Established storage facilities | 20(21%) | 10(14%) | 15(16%) | 15(22%) | 22(19%) | 8(16%) | 26(19%) | 4(12%) |
| No suggestions stated | 11(11%) | 16(24%) | 19(22%) | 8(12%) | 20(16%) | 7(14%) | 23(18%) | 4(12%) |

Table 51: Suggestions made by elementary school teachers who said the supply of instructional media in their respective schools.

figures show all the eighteen (18), urban and rural, schools as possessing a chalk-board and text-books. As a matter of fact these are the cornerstones of teaching in this country.

In recent years, there have been active attempt to get other (new) media to complement chalk-board in elementary school teaching in the United States of America and United Kingdom. In fact Gordon suggests that chalk-boards be done away with. To quote him: "do not provide chalk-boards in any new classrooms; remove them from all existing rooms."* To find out whether local teachers would be happy with innovations an item on the role of chalk-board given other instructional media was developed. The main interest was to find out whether the chalk-board would be used more or less frequently in teaching or would it be dropped altogether! Over fifty (50%) percent of teachers of all categories with the exception of inexperienced and unqualified teachers strongly agreed with the suggestion. Experienced teachers, who have been exposed to various instructional media, contributed more than any single category to these responses (61%). On the contrary, more than sixty (60%) percent of the inexperienced and unqualified felt the role of the chalk-board would not be affected at all. That such response came from the two categories of teachers does not come as a surprise. Teachers of the same categories are either uncertificated or on probation. The results are presented in table 57.

* See bibliography pg. 205

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|----------------|---------|---------|---------|---------|---------|----------|---------|---------|
| Strongly agree | 61(53%) | 40(53%) | 52(51%) | 49(55%) | 82(61%) | 19(33%) | 87(58%) | 14(33%) |
| Do not agree | 52(45%) | 34(45%) | 46(45%) | 40(45%) | 50(87%) | 36(63%) | 59(39%) | 27(64%) |
| Not decided | 3(2%) | 2(2%) | 5(4%) | 0(0%) | 3(2%) | 2(4%) | 4(3%) | 1(3%) |

Table 52: Response distribution among the three options of item 15 of the questionnaire.

It would seem that local elementary school teachers would accept Gordon's 'simple innovation' provided other appropriate instructional media are available. The implications of such an innovation are far ranging. This would mean modifying the existing classrooms and even building new ones that could be suitable for the new media; supply of hydro or thermal electricity to all elementary schools, and intensive training (in-service or pre-service) of teachers in instructional technology. Despite the apparent high cost of implementing Gordon's suggestion an attempt should be made to try it in our schools. Perhaps, Gordon was rather irrational. To modify this suggestion, chalk-boards and new media ought to be complementary.

Using the chi-square (χ^2) statistic analysis, there was no significant association between men and women elementary school teachers with respect to their response to item 15. Thus, sex did influence the teachers' responses. This was tested at 0.95 (95%) level of significance. However, there was significant association between urban and rural, experienced and inexperienced, and trained and untrained elementary school teachers at 0.70 (70%) and 0.01 (1%) levels. It would seem, therefore, that environment, teaching experience, and professional training did not influence the teachers' responses as table 53 shows.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 0.0034 | P < 0.95 NS |
| Environment | 0.4066 | P > 0.70 S |
| Experience | 12.1066 | P > 0.01 " |
| Professional training | 8.0202 | P > 0.01 " |

Table 53: Analysis of response distribution among the options of item 15.

Still on the role of a chalk-board in elementary school teaching, teachers were asked to rank six instructional media, including the chalk-board, by simply indicating how much time they would allocate to each of them if they were given thirty (30) teaching hours per week. Contrary to several opinions teacher lectures, field trips (exursions), and radio broadcasts to schools were allocated the least amount of time. However, class discussions and then followed by chalk-boards were allocated most time by teachers of all categories. On the average, class-discussions were allocated six and one-half (6.5) hours, while chalk-boards six (6) hours only. Although this contradicts the response to item 15 it would seem teachers still rank chalk-boards high among other media. That teacher lectures should have been ranked fourth is a distortion of what exactly happens in elementary schools. Teachers are occasionally heard saying "to-day I real lectured". Contrary to modern theories of teaching, lecturing still prevails in elementary school teaching in this country.

It was expected that field trips would be ranked low by teachers. This media is beyond the capability of elementary school teachers, especially when the financial and physical planning aspects of it are considered. It is no secret that elementary school teachers are ill-prepared while in the Colleges of teacher education in the organisation of exursions. Never-

theless, a few teachers organise inter-lesson outings for their classes. In most cases they do not impress the children. While out of class, the latter just do not know what to do. It would appear that colleges of teacher education do not emphasis very much the role of this media in elementary school teaching.

The ranking of radio broadcasts to schools as last came as no surprise. Teachers had already complained about radio lessons. However, it suffices to say that time for this media is fixed by the schools broadcast service unit unless a school has tape-recordings. The following tables present the results so far discussed. Table 54 provides the picture of ranking in time (hours) while table 55 rank order only.

Using the Spearman rank correlation coefficient statistic it was found that there was marked relationship between men and women (0.94) urban and rural (0.89) experienced and inexperienced (0.94), and professionally trained and untrained (0.94) elementary school teachers in their ranking of the use of six elementary school media of item 16. That is, there was no significant difference in their ranking of these media.

Item 9 required teachers to indicate which type of instructional technology materials they have been exposed to in the past one year. Forty-six (46%) of the teachers said they had neither read nor attended any professional meetings on instructional technology; twenty-two (22%) said they had read the literature only; nine (9%) percent indicated they had attended

| Serial No. | Instructional media | Male | Female | Urban | Rural | Exper. | Inexper. | Trained | U/Q/T |
|------------|---------------------|---------|---------|---------|---------|---------|----------|---------|---------|
| | | Hrs min | Hrs min | Hrs min | Hrs min | Hrs min | Hrs min | Hrs min | Hrs min |
| 1 | Teacher lectures | 4 38 | 3 46 | 4 13 | 4 10 | 4 02 | 4 16 | 4 30 | 4 29 |
| 2 | Demonstrations | 5 19 | 4 37 | 5 23 | 4 52 | 4 55 | 5 03 | 5 18 | 4 26 |
| 3 | Chalk-boards | 5 42 | 5 37 | 5 19 | 6 11 | 6 01 | 5 05 | 6 07 | 4 33 |
| 4 | Radio broadcasts | 3 17 | 3 19 | 3 07 | 3 34 | 3 02 | 3 32 | 3 14 | 3 14 |
| 5 | Fields-trips | 3 55 | 4 36 | 4 02 | 4 36 | 4 15 | 4 03 | 4 04 | 4 18 |
| 6 | Class discussions | 6 30 | 7 51 | 6 34 | 6 48 | 6 34 | 6 46 | 6 49 | 5 48 |

Table 54: Ranking of the six instructional media in time (hours) as given by elementary school teachers.

| Serial No. | Instructional media | Male | Female | Urban | Rural | Exper. | Inexpers. | Trained | U/Q/T |
|------------|---------------------|------|--------|-------|-------|--------|-----------|---------|-------|
| 1 | Teacher lectures | 4 | 5 | 4 | 5 | 5 | 4 | 4 | 3 |
| 2 | Demonstrations | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 4 |
| 3 | Chalk-boards | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| 4 | Radio broadcasts | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| 5 | Field trips | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 5 |
| 6 | Class discussions | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Table 55: Rank order of the six instructional media of item 16 of the questionnaire.

either professional meetings, workshops or seminars while twenty-three (23%) percent of these teachers said they had both read literature on instructional technology and attended professional meetings. These results reveal that about one half (50%) of our teachers teach as they were taught. They have no access to new ideas in teaching profession which are provided through such media as journals, professional magazines and meetings. And even when the list of the literature which some of the teachers claim they have been exposed to is examined it does not show any evidence that instructional technology is being widely read. These teachers said they had read such materials as lesson notes for Christian teaching by Owen, W. and Bethel, W., UNESCO source book; radio broadcast pamphlets, S.B.S. unit; Methods of teaching by Margaret Grant; Visual Aids in Primary schools; psychology and communication, and a history of education by Curtis. The only journals said to have been read were the 'Kenya Teacher' and Newsletter of the Ministry of Education. In fact all the above literature is the same one most of these were exposed to while in the colleges of teacher education.

The majority of the teachers who said they had attended professional meetings cited mainly seminars on specific subjects. One teacher, however, said he had attended a conference on communication media organised by the Kenya Institute of Education.

Apparently, our teachers have interest in reading and are willing to attend professional meetings whenever they are invited.

This is a fact which the instructional technologists should explicit in their endeavour to enable teachers realise that teaching profession provides more than talk-and-chalk method. It suffices to mention the launching of an instructional technology journal to inform both practising and training teachers about the recent and possible innovations in elementary school teaching, locally and abroad. Beside such a publication, technologists should organise professional meetings aimed at promoting instructional technology in this country. Through such venues, teachers would be in position to express their views about certain innovations that are taken for granted. Hence diffusing a dangerous situation which could develop between these teachers and educational administrators.

Table 56 presents response distribution among the three options of item 9 and this is followed by the chi-square (χ^2) analysis of these responses to test the association between sets of all categories of elementary school teachers. In the case of others, teachers were required to specify their response.

It is desirable to discuss, briefly, professional training in instructional technology before we conclude this chapter. This aspect of professional teaching is not taken seriously in our colleges of teacher education. No one college has a sub-department called communications and technology as an aspect of professional studies. What there is is the ill-conceived and often poorly organised New Primary Approach (N.P.A.).⁴⁵

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INSTR. | TRAINED | U/Q/T |
|---------------------------------------|---------|---------|---------|---------|---------|---------|----------|---------|
| Books, Journals, Magazines .. etc. | 31(25%) | 12(15%) | 15(14%) | 28(30%) | 30(21%) | 13(21%) | 30(19%) | 13(29%) |
| Professional meetings | 14(11%) | 6(8%) | 11(10%) | 9(10%) | 18(13%) | 2(3%) | 16(10%) | 4(9%) |
| Others (Specified) | 78(64%) | 62(77%) | 84(76%) | 56(60%) | 94(66%) | 46(76%) | 112(71%) | 28*62% |

Table 56: Response distribution among the three options of item 9 (exposure to instructional technology literature and professional meetings.

This practice is reflected in the teachers who go through these colleges. In most cases they are not creative enough in their teaching. Furthermore, they are suspicious of any deviation from what they are used to. But if these teachers were well trained in this field (instructional technology), school children would not be exposed to a narrow range of experiences. It is, therefore, the contention of the writer that teacher-trainees and practising teachers be prepared for the inevitable innovations through pre-service and in-service courses. Great emphasis should be placed on the use of relevant local resources in elementary school teaching.

To find out whether teachers feel there is need for professional training in instructional technology or not, item 8 was included in the questionnaire. Teachers were asked to indicate whether they would agree or not agree with the often said statement that "teachers are born and not made". The distribution of responses among the three options of the item is presented in table 57. From this table, it seems teachers found it difficult to say whether they would agree or not agree with that suggestion. About fifty (50%) percent of them said they agree with the quotation while about forty-three (43%) percent did not. This is quite disturbing. It does paint a bad picture of elementary school teachers, especially those who are trained. This confirms what has been said above that colleges of teacher education do not prepare their trainees well enough (in instructional technology) to appreciate the

difference between them and their untrained counter-parts. This is understandable since no serious development in educational technology has actually occurred in elementary school teaching in this country. Teachers use mostly chalk-boards, text-books and other common materials which any literate person can use to instruct other. These involve no special technical know-how which could be identified exclusively with elementary school teachers. Perhaps the supply of new media to schools could make people realise the need for training in teaching since a teacher would have to train before operating some of these media, for example, educational television, tape-recorders, and over-head projectors and transparencies.

Using the chi-square analysis, association between men and women, urban and rural, and experienced and inexperienced elementary school teachers was found to be significant at 0.02 (2%), 0.01 (1%), and 0.10 (10%) levels respectively. That is the differences between the sets of attributes was not purely by chance. However, professional training did influence the teachers' responses when tested at 0.50 (50%) level of significance. Thus, the difference between the two sets of attributes was purely by chance.

In the next chapter, an attempt will be made to discuss some of the main conclusions drawn from the preceding discussions and the subsequent recommendations.

| OPTION | MALE | FEMALE | URBAN | RURAL | EXPER. | INEXPER. | TRAINED | U/Q/T |
|--------------|---------|---------|---------|---------|---------|----------|---------|---------|
| Agree | 61(49%) | 40(49%) | 50(45%) | 51(54%) | 71(50%) | 30(48%) | 76(48%) | 25(54%) |
| Do not agree | 58(46%) | 35(43%) | 52(46%) | 41(43%) | 66(46%) | 27(43%) | 75(47%) | 18(39%) |
| Not decided | 6(5%) | 6(8%) | 9(9%) | 3(3%) | 6(4%) | 6(9%) | 9(5%) | 3(7%) |

Table 57: Response distribution among the three options of item 8 of the questionnaire.

| ATTRIBUTE | CALCULATED χ^2 RESULTS | LEVEL OF SIGNIFICANCE |
|-----------------------|--------------------------------|--------------------------|
| Sex | 10.3449 | P > 0.02 S |
| Environment | 12.0868 | P > 0.01 " |
| Experience | 7.2404 | P > 0.10 " |
| Professional training | 2.2207 | P < 0.50 NS |

Table 58: Analysis of response distribution among the three options of item 9 of the questionnaire.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Admittedly, it is not possible to provide a single, appropriate conclusion to such a wide ranging discussion as the present one. Thus, it is intended that the details of main conclusions and alternatives to the present practice in the use of instructional media in elementary school teaching in this country be discussed. All the points of discussion will be drawn from the discussion and will loosely be divided into five sections, namely, availability of instructional media, professional training of teachers in instructional technology, utilisation of the available instructional media by elementary school teachers, the attitude of teachers towards these media, and, finally, the summary of the discussion.

In item 1, elementary school teachers were required to show, by ticking in the provided boxes, which of the given instructional media were actually available in their schools. As is evident from figures 5 and 6 only twenty (56%) of the instructional media were said to be available in all the eighteen schools selected for this survey. And there was definite difference between urban and rural elementary schools with respect to the available media. It would seem, therefore, that school children are exposed to a limited area of experience by the end of their seven-year elementary school education. Teachers, too, have a narrow range of instructional media from

which to select those suitable for their respective teaching. The most common media are text-books, chalk-boards, teacher-made notes, teacher lectures, etc. These are but some of the traditional media still going strong in elementary school instruction. On the whole, our elementary schools have inadequate supply of teaching materials and equipment.

In view of the existing situation, the following observations are advanced if there is to be any significant change. However, the writer is aware of the problem which the Government is most likely to experience when some of the recommendations and suggestions made are implemented. Generally, most educational innovations are expensive since they involve skilled manpower and machinery which this country lacks at the moment. While talking about the use of New Educational Techniques in the developing countries, Beardsworth has singled out four main problems that machinery in education poses for the developing countries (Kenya included): "cost; lack of electricity; operations, maintenance and repair; and shortage of sufficient, relevant teaching materials to use with the equipment or medium"⁴⁶. One fact which we must accept as developing nations is that most of problems have come to stay. Therefore, it would be naive for us to let "instructional technology wash lightly upon the shore of our elementary school instruction" until these problems are eventually solved.⁴⁷ What is needed is improvisation and creative adventures in elementary school education. At present we do not need expensive instructional media that are likely to drain our limited resources. Let these be utilised in

developed countries where they are designed. Developing countries should turn to their local resources for elementary school instructional media. This does not mean we ignore completely those new media with foreign orientation. We should adapt those media we can afford and those that are relevant to our educational needs.

If local resources have to be developed into instructional media, one important recommendation that can be made is the establishment of a Materials Resources Centre (M.R.C.) next to the Kenya Institute of Education (K.I.E.). Its purpose would be to disseminate and co-ordinate information on instructional media and supply teaching materials and equipment to all elementary schools throughout the country. This body would also conduct research into the availability and effectiveness of local resources, and also design elementary school instructional materials relevant to local educational needs. This centre could also prepare manuals and other materials to accompany these items that are subsequently supplied to schools.

The model for the Materials Resources Centre to be established is provided by Culling's description of such a centre in Britain. That is, there should be a director or warden, someone who possesses the personal and professional attributes needed for revitalizing the teaching in surrounding educational institutions. His duties could include administration of courses, organization of curriculum development,

arranging professional conferences, visiting schools and making other necessary outside contacts, arranging exhibitions and so on. The director should be a teacher of experience - as matter of fact, a successful teacher. As expected, the director cannot cope single-handedly with the manifold expectations and demand of burgeoning materials Resources Centre. There is need for a deputy director or leader, someone with distinguished service in teaching profession, secretariate, and technicians to design, maintain and repair some of the teaching materials and equipment. Finally, there must be a team of sub-ordinate staff to maintain the centre. Although it looks costly, its services to elementary school apparently justified its creation.

In addition to the establishment of the Materials Resource Centre next to the K.I.E., Provincial, district and Zonal materials centres should be created and organised on the same pattern as the main one. In-service courses, professional conferences, seminars and occasional informal meetings among elementary school teachers could be held at these centres. The main organisers and speakers at these meetings would comprise media specialists from the two Universities (Nairobi and Kenyatta), main materials Resources centres, and perhaps visiting media specialists. Tutors/lecturers from Colleges of teacher education could also participate in these gatherings. The bulk of the audience should be made up of practising teachers.

Perhaps the reader is being disturbed by what is meant by the Zonal Materials Resource Centre (Z.M.R.C.). This centre comes into being when a number of elementary schools in a given zone decide to pool their teaching materials as equipment. Usually, the latter are stored in one, central area, easily accessible to all the member schools. Teachers from these member-schools can only collect these items on loan by signing for them. This practice ensures equitable supply and use of the available instructional media, let alone the secure storage facilities these centres provide. The Zonal Materials Resource Centres combine to form a district centres (D.M.R.C.) which in turn combine to form Provincial Materials Resources Centres (P.M.R.C.).

While it is quite possible, given time, to introduce new techniques and equipment (new media) into all the colleges of teacher education (after all, there are only seventeen colleges), it is financially impossible to supply each elementary school teacher in all the elementary schools around the country with a wide range of the new media. Thus, there is need to re-organise the present system of supplying teaching materials and equipment to elementary schools. Instead of each school receiving a supply of these items, it is suggested that Zonal materials resource centres be formed to place orders for these materials and equipment. After all, these centres are likely to be staffed with media specialists. The Kenya School Equipment

Scheme could supply these teaching items to fewer areas than is the case at present. The problem of transporting the items would not be acute as it is to-day. The District Road Maintenance Units would be able to maintain the few roads leading to these zonal centres as compared to the over five-thousand routes scattered all over the country to-day. It is also emphatically suggested that zonal centres be provided with recreational facilities where teachers would meet and hold professional discussions among themselves. This would go a long way to overcome the problem facing most elementary school teachers of feeling lonely after duty.

One main conclusion to be drawn from the present survey is that most elementary school teachers are, apparently, not properly trained in the use of various new media. Traditionally, colleges of teacher education have tended to emphasize the use of chalk-boards, text-books, story-telling, and organisation of imaginary journey to foreign lands at the expense of new media like planning for a radio broadcast lesson. Consequently, most teacher-trainees have completed their courses with little or no knowledge of utilising some of the new media in elementary school instruction. For example, most do not know even how to operate a Kodak camera! Definitely, lack of training in the use of these media explains the negative attitude of teachers towards some of these media. This also makes them to regard the development, selection and design of teaching materials and equipment as the sort of work outside their domain. But the establishment of Materials Resource Centre would

definitely mean a re-organisation in the present practice of training teachers. The creation of a communications and instructional technology sub-department in the Professional Studies Department will have to be realised in all the Colleges of teacher education. Its main function would include training teachers in the use of the available instructional media; development and design of simple elementary school teaching apparatus, and, of course, to instil a creative attitude among the teacher-trainees. It is only when this is done that what Campbell said can materialise. That is

"In the actual selection of instructional materials, teachers should play a large part".^{*()}

For teachers to assume this important role, Colleges of teacher education should be re-organised on the above line. The future teacher-trainees should therefore not only be trained in how to utilise the instructional media but also in selecting them. A combination of these two aspects of instructional technology would ensure efficient use of new media in elementary school teaching. It is common that people will tend to select those items they can utilise properly. Once this happens Eash's fear would not arise:

"..... good materials imperfectly implemented in the classroom and not in accordance with the producer's design are as much as source of learner problems as are ill-designed materials."⁴⁹

The present practice in the Colleges of teacher education whereby new media are given lip-service treatment in the teacher-training programmes is not conducive to educational innovations. It is an open secret that most teacher-trainers lack training in instructional technology and perhaps that is why they do not teach it. The writer, therefore, recommends that these tutors/lecturers, to serve as a good model to their students, should be in-serviced in this important field during the vacations. Media specialists from the University of Nairobi and Kenyatta University College should be encouraged to organise and conduct such courses for all the tutors/lecturers throughout the seventeen (17) Colleges. Should these people not have time to do this work, then the Government should not hesitate to use UNESCO experts. The privileges accorded by the Ministry of Education to other educational experts should be extended to them too. Educational administrators should also be exposed to the same in-service courses if contradictions between the training and supervisory personnel are to be avoided. As is evident from the present study, most elementary school teachers feel that educational administrators should be in-serviced in instructional technology - a clear reference to their being out-of-date in this field. Further evidence of this is the complaint that not many teachers readily accept instructions in instructional technology from these officials.⁵⁰

To really change behaviour and attitude of teachers towards educational innovations pre-service and in-service programmes are not enough. Dissemination of information on new media through professional journals, books and public discussions should be intensified. The acute problem that exists in most elementary schools in this country to-day is the dearth of information on new media. Professional journals are hard to come-by as are books and newsletters. It is in view of this problem that the writer recommends immediate establishment of materials Resource Centre to disseminate and co-ordinate information on teaching materials and equipment through regular circulars. Even research studies, conducted locally, hardly reach most of these schools. What is needed is a professional journal in which these studies could be reported in a layman's language and then be circulated to all educational institutions at a subsidised cost.

The need for research in instructional technology has never been so necessary as to-day. Smith and Anderson have summed up this need in the following words:

"In view of the immense sums of money which have been expended recently and are likely to be spent at an accelerating rate in the next decade for facilities for science instruction, one is impressed by the paucity of educational research directed toward objective evaluation of facilities of various types." 51

There is no doubt that the Government is investing heavily in education. In elucidation of this fact, the Permanent Secretary to the Ministry of Education while addressing students at Highridge Teachers' College pointed out that the Government was currently investing heavily in education facilities.⁵² This demonstrates the Government's concern of the quality of education our educational institutions are currently providing. But it is naive to spend an immense sums of money on these facilities unless research have identified the priorities. Research is the only sure indicator of what programmes in education should be allocated more money and which should receive least attention. It is a guide to planners, designers, instructional technologists as well as the teachers who implement the educational innovations in the classrooms.

So far, little or no local research in instructional technology has been conducted and subsequently reported in professional journals. The only available research reports have been conducted in Tanzania and Uganda by the Institute of National Education and the Makerere Institute of Education respectively. But the acute problem that exists in this part of Africa is the dearth of information on such useful investigations. Perhaps it is necessary to suggest again that a professional journal, written in simple language, should be launched and then circulated to all elementary schools. Such an organ will help to change the teachers' attitudes towards some of the new media. Thus, accelerating the already on-going campaign to reduce the dominant

dominant role a chalk-board and a piece of chalk in elementary school teaching in East Africa. Mr. Jengo says "Come are the limits of colonial days, when a (chalk-board) and a piece of chalk was the summit of teaching"⁵³. How far this has happened in this country is debatable.

It has already been said elsewhere that there is serious concern among instructional technologists about the use of complex instructional materials and equipment in elementary school teaching. Vessel, when talking about media education, has warned that

"Complex equipment may cause the child to focus his attention on the equipment and not the principle being demonstrated."⁵⁴

Most of the new media should be cautiously utilized if we have to avoid what is contained in Vessel's warning, and the expenditure on equipment which our ill-prepared teachers are most likely to keep away in dark-cupboards or offices. The Materials Resource Centre Unit of the Faculty of Education, University of Nairobi, has compiled a list of instructional media publications and can, if requested, send it to any interested teachers or schools. From this long list or catalogue, teachers can select those media which, in their capacity, they can use efficiently. In addition, this resource centre has developed many and simple materials useful in elementary school instruction which, the writer understands,

can be loaned to interested teachers. Dr. Eshiwani is also currently involved in a project designed to produce apparatus from local materials for elementary school Mathematics teaching.⁵⁵ Perhaps the Government introduced the Master degree programme for teacher trainers at the University of Nairobi in 1974 with this desire in mind.

One problem which media specialists are most likely to encounter in this country is the apparent lack of sense of creativity among elementary school teachers. This is so because most of them went through a system of education which denied them the development of this important talent. They were spoon-fed by their teachers and even tutors.⁵⁶ For children to develop this talent, they must be frequently confronted with challenging tasks. The type of education provided to-day in most of our elementary schools lacks in this aspect of education. Contrary to several opinions, lectures and teacher made notes still prevail in elementary school teaching. It is, therefore, recommended that a variety of instructional media be utilised by elementary school teachers. But this will necessitate a drastic departure from the architectural frame-work of the existing classrooms. The inflexible classrooms, designed for the kind of education desired and practised during the time of their construction should be replaced with flexible classrooms meant for the present educational needs.⁵⁷ It should be made mandatory that any new class-rooms should be constructed according to the teachers and Ministry of Education's requirements. That is, they should be roomy, possess large windows fitted with

shutters, lockable doors, secure storage facilities (lockers) in which the teacher and school-children can keep their materials and equipment. Instead of desks, large tables and chairs should be provided. Show-cases should be installed in these classrooms as well for exhibiting the teaching "aids".

Beside the architectural frame-work of the existing classrooms in elementary schools, there is the acute problem of classroom shortage. It is common-place to come across school children especially in the rural areas huddled under a tree shade listening attentively to their lecturing teacher. Although we all agree that children need comfort if they are to enjoy learning processes, little is being done to alleviate the problem of class-room shortage in this country. It is true, parents and the communities at large have contributed alot towards nation building but I dare say not towards elementary school education. Perhaps this feature has been caused by lack of co-operation between teachers and parents, and the schools and communities. There are school committees which of late have developed into political forums. Whenever school meetings are convened, not all members turn up and if they do, members keep on accusing one another for this or that incident. But prospects of raising funds for elementary school education in this country are great. The writer once witnessed over fifty-seven (57,000/-) thousand shillings raised at one elementary school fund raising meeting in about two hours in Nandi District.*

* Fund raising meeting conducted at Kasirai School in 1972.

It would seem that parents and communities are willing to contribute towards the development on what the contributions will be spent. One way of instilling confidence in parents is to form parent-teacher associations. These could hold occasional consultation meetings to review the progress of their respective schools. It is at such meetings that parents could be urged to encourage the communities to contribute generously towards the elementary school funds. These contributions could go to the purchase of necessary elementary school teaching items, and construction of modern class-rooms, storage facilities and teachers' houses. To ensure that this money is not misappropriated, the associations could set up a committee to look into their financial affairs regularly.⁵⁸

The general picture provided by the present study shows that most teachers are not happy with the present supply of instructional media in schools. The way this situation can be rectified has been discussed in one of the above paragraphs. However, it would not be logical to abolish the Kenya School Equipment Scheme for failing to function as expected. Most of the problems teachers experience with respect to the supply of instructional materials and equipment are beyond its capacity. For example, Kenya School Equipment Scheme can do nothing about impassable roads leading to some of the remote, rural schools. What is needed is to establish materials centres to which this scheme could deliver the required teaching items. It would be the teachers' duty, then, to collect them from these professional centres. This practice would ensure that all teachers and

children are exposed to most instructional media that are commercially produced and then supplied by the Ministry of Education. Nevertheless, there is one problem which all those involved in media education should recognise. That is

"One of the more troublesome aspects of teacher education is the failure of many teachers to teach as they were taught by the Colleges at which they were prepared".⁵⁹

This sort of argument leaves a lot to be desired. To-day educators are calling for divergent thinking and not convergent attitude among the teachers and children. It would seem that it is not necessary that teachers should teach as they were taught. The proposed system of supplying instructional media would encourage divergent thinking. Hence, creative learning processes.

The above quotation raises one long debated issue - should tutors/lecturers be allowed to supervise their teacher-trainees for a period of two years after formal teacher training course? This would not be necessary if the supervisory staff is properly trained in instructional technology as suggested above. The reality is that teachers would like to experiment with some of the media which their tutors/lecturers did not train them to utilise. Supervision by tutors would definitely suppress this creative development. What actually happens is that whenever these teachers attempt to utilise new media in their

teaching, they keep experiencing a series of frustrations.

The establishment of a Materials Resource Centre has a number of implications for the Ministry of Education. Among the most important problems posed are the site of this centre, capital finance it, and the personnel to man it. It has already been pointed above that this centre should be located next to the Kenya Institute of Education so that their activities are co-ordinated. Lack of co-ordination is likely to result in duplication of projects which is a waste of time and money. The writer also feels that the University of Nairobi and Kenyatta University College should bring their experiences to bear in this programme. The present practice whereby the Kenya Institute of Education and these two institutions of higher learning are miles apart in their activities should be reviewed and, if possible, revised. This will provide a healthy situation in which research in educational media can be conducted and then findings discussed by all these educational bodies.

To maintain an up-to-date collection of materials and equipment in the Materials Resource Centre is a costly adventures.⁶⁰ The Ministry of Education must raise extra funds to establish and maintain such a centre. Already, there are genuine complaints that education is almost swallowing up one third (> 30%) of the annual national expenditures. Even some people have gone on record by suggesting that instead of increments for educational expenditures, the Government should be considering seriously trimming some of the present expenditures by the Ministry of

Education. Among those suggested as the likely expenditures to be trimmed are teachers' salaries.⁶¹ But such a move is not only likely to prompt unprecedented industrial dispute between the powerful teachers' Union (KNUT) and the employer, the Ministry of Education but also result in low quality teachers since the capable ones could quit the teaching profession. Whatever is the argument, the role of a Materials resource Centre in school and college instruction has been found to justify its creation. Therefore, the Government in general and the Ministry of Education in particular, should raise money, even if it means cuts in some of the present expenditures, to establish and maintain a Materials Resource Centre.

The writer is well aware that local media specialists are lacking. In view of this shortage it is suggested that the Government be urged to seek the services of UNESCO media experts and expatriates from friendly countries. Meanwhile every effort should be made to train local people to eventually take-over the control of this institution. These people could be trained locally or abroad. In the case of the latter, those people to be trained had better take good the warning that their design, selection and utilisation of instructional media should reflect the local educational needs and not those of the environments of their training. Nevertheless, they must produce, select and use the finest and relevant learning materials and equipment that our local environments are capable of creating for the

education of all of our school children in elementary schools,
without exception.⁶⁴

As any other innovation, many people are likely not to accept departures from the established instructional media. It is up to those entrusted with introducing innovations in school and college instruction, and indeed the Government, to convince the public that these changes are for the better. Judging from what appears in the press, it seems the country is ready for instructional innovations. For example, the deputy P.C. of Western Province is said to have called for 'improved teaching methods'. Even though, the initiators of such innovations in education must accept the inevitable frustrations that occasionally accompany such developments.

APPENDIX A

UNIVERSITY OF NAIROBI

FACULTY OF EDUCATION

QUESTIONNAIRE

This questionnaire, divided into two sections, has been developed to assess the available instructional media in Primary schools, (1), utilisation of these media by Primary school teachers, (2), teachers' professional training in instructional technology, (3), and the teachers' attitudes towards a variety of instructional media. Section (A) consists of basic information required of respondents while section (B) comprises both closed- and open-ended items. In all, there are sixteen (16) items.

Respond to each of the items in Section (A) by filling in the missing information while in section (B) respond by marking, with a tick, in the provided box that best indicates your response. Your honest response will enable the researcher to assess the above aspects of instructional technology and subsequently make the necessary recommendations to the authority responsible for the supply of the teaching items that are currently in use in our Primary Schools.

(Note: Your opinions, obviously, will have no effect on your designation since your identity is anonymous).

Kafu, A.P.

January, 1976

A. Fill in the missing information in this section.

- I. Name of school _____ Date _____
- II. Type of school _____ Urban/Rural
- III. Size of school _____ streams
- IV. Teacher's grade _____ sex _____ Male/Female
- V. Teaching experience _____ Years/Months

B. Below are statements about instructional media. Put a tick in a box, , against the response which in your opinion, you consider definitely CORRECT, and elaborate on your response where it is indicated so.

1. Available instructional media

I. From the following list of instructional media indicate those used in your school putting a tick in the provided boxes,

- | | | | |
|-----------------------|--------------------------|--------------------------------|--------------------------|
| 1. Teacher lectures | <input type="checkbox"/> | 9. Overhead projectors | <input type="checkbox"/> |
| 2. Class discussions | <input type="checkbox"/> | 10. People (Guest speakers) | <input type="checkbox"/> |
| 3. Chalk-boards | <input type="checkbox"/> | 11. Tape-recorders | <input type="checkbox"/> |
| 4. Type-writers | <input type="checkbox"/> | 12. Story-telling | <input type="checkbox"/> |
| 5. Flannel boards | <input type="checkbox"/> | 13. Overhead transparencies | <input type="checkbox"/> |
| 6. Phonograph (Record | <input type="checkbox"/> | 14. Text-books | <input type="checkbox"/> |
| Player) | | 15. Field-trips (excursions) | <input type="checkbox"/> |
| 7. Notice (Bulletin) | <input type="checkbox"/> | 16. Tapes, discs (records) | <input type="checkbox"/> |
| boards | | 17. Felt-pens and/or Paints | <input type="checkbox"/> |
| 8. Sewing machines | <input type="checkbox"/> | 18. Manila and/or Sugar Papers | <input type="checkbox"/> |

- | | | | |
|-------------------------|--------------------------|------------------------|--------------------------|
| 19. Exhibits (Displays) | <input type="checkbox"/> | 28. Piano | <input type="checkbox"/> |
| 20. Wall-charts | <input type="checkbox"/> | 29. Drums | <input type="checkbox"/> |
| 21. Film-strips | <input type="checkbox"/> | 30. Flutes | <input type="checkbox"/> |
| 22. Specimens (relia) | <input type="checkbox"/> | 31. Games | <input type="checkbox"/> |
| 23. Diagrams | <input type="checkbox"/> | 32. Camera | <input type="checkbox"/> |
| 24. Pictures | <input type="checkbox"/> | 33. Flash Cards | <input type="checkbox"/> |
| 25. Drama | <input type="checkbox"/> | 34. Maps | <input type="checkbox"/> |
| 26. Models | <input type="checkbox"/> | 35. Globes | <input type="checkbox"/> |
| 27. Radio | <input type="checkbox"/> | 36. Teacher made notes | <input type="checkbox"/> |

2. What type of instructional media would you prefer in Primary school teaching?

- a. Teacher and/or pupils produced materials
- b. Ministry of Education produced materials
- c. Commercial materials, e.g. Brooke Bond, Airline charts, etc.
- d. Others

Give reasons for your response _____

3. Do you have a radio at
- a. Home and school
 - b. School only
 - c. Home only
 - d. None

4. Who should determine the type of instructional media to be used in the primary school teaching?

- a. Ministry of Education
- b. Classroom teacher
- c. Others

Why do you think so? _____

2. UTILISATION OF INSTRUCTIONAL MEDIA

5. How often do you use local resources (people, specimens, field trips, story-telling etc.,) in your primary school teaching?

- a. Always
- b. Sometimes
- c. Never

Why is it so? _____

3. TEACHERS' PROFESSIONAL TRAINING IN INSTRUCTIONAL TECHNOLOGY

6. a. What is a teacher Advisory Centre (T.A.C.)?

b. What is its function with regard to Primary School teaching? _____

c. Is there one in the neighbourhood of your school?

- i. Yes
- ii. No

d. If your response to question (c) is Yes, then the name of this T.A.C. is _____
How many times have you been to this Centre (twelve months ago)? _____ times.

7. "Most instructional media (Audio-Visual aids) spend ninety per cent (90%) of the school week locked up in dark cupboards (and offices)."

Does this apply to your school?

a. Always

b. Sometimes

c. Never

8. "Teachers are born and not made". Would you agree with this statement in view of the present innovations in education?

a. Strongly agree

b. Do not agree

c. Not decided

9. What type of materials concerning instructional technology have you been exposed to in the last one year?

a. Books, Journals, Pamphlets, Magazines etc.,

b. Others

Specify _____

If your response is either a or b or c, give the titles of the print materials you have read or themes of the Conferences, Workshops, Seminars,etc., you have attended.

TITLE OF PRINT MATERIALS AID/OR THEMES OF CONFERENCES. ...ETC.

| | |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

4. THE TEACHERS' ATTITUDES TOWARDS INSTRUCTIONAL MEDIA

10. How often do you use Radio Broadcasts to school in your Primary school teaching?

- a. Regularly b. Sometimes c. Never

11. How would you rate the present supply of instructional (audio-visual aids) media in your school?

- a. Adequate b. Inadequate c. Not decided

What improvements would you suggest in respect of your response and the storage of these instructional media?
(list your suggestions?)

12. If the Ministry of Education (Kenya) had extra funds of about two million (2,000,000/-) shillings set aside for Primary school education, on which of the following (ONLY ONE) items would you suggest it to be spent?

- a. Teachers' Salaries (Primary)
- b. Supply of instructional media
- c. Improvement of school buildings

Why do you think so? _____

14. Would you favour the suggestion that local (divisional Municipal) educational administrators should supervise the use of a variety of instructional (audio-visual aids) media by Primary school teachers in their teaching?
- a. Strongly favour it
 - b. Do not favour it
 - c. Not decided

Do you think these officers are experienced enough in instructional technology (audio-visual aids education) to do this sort of work?

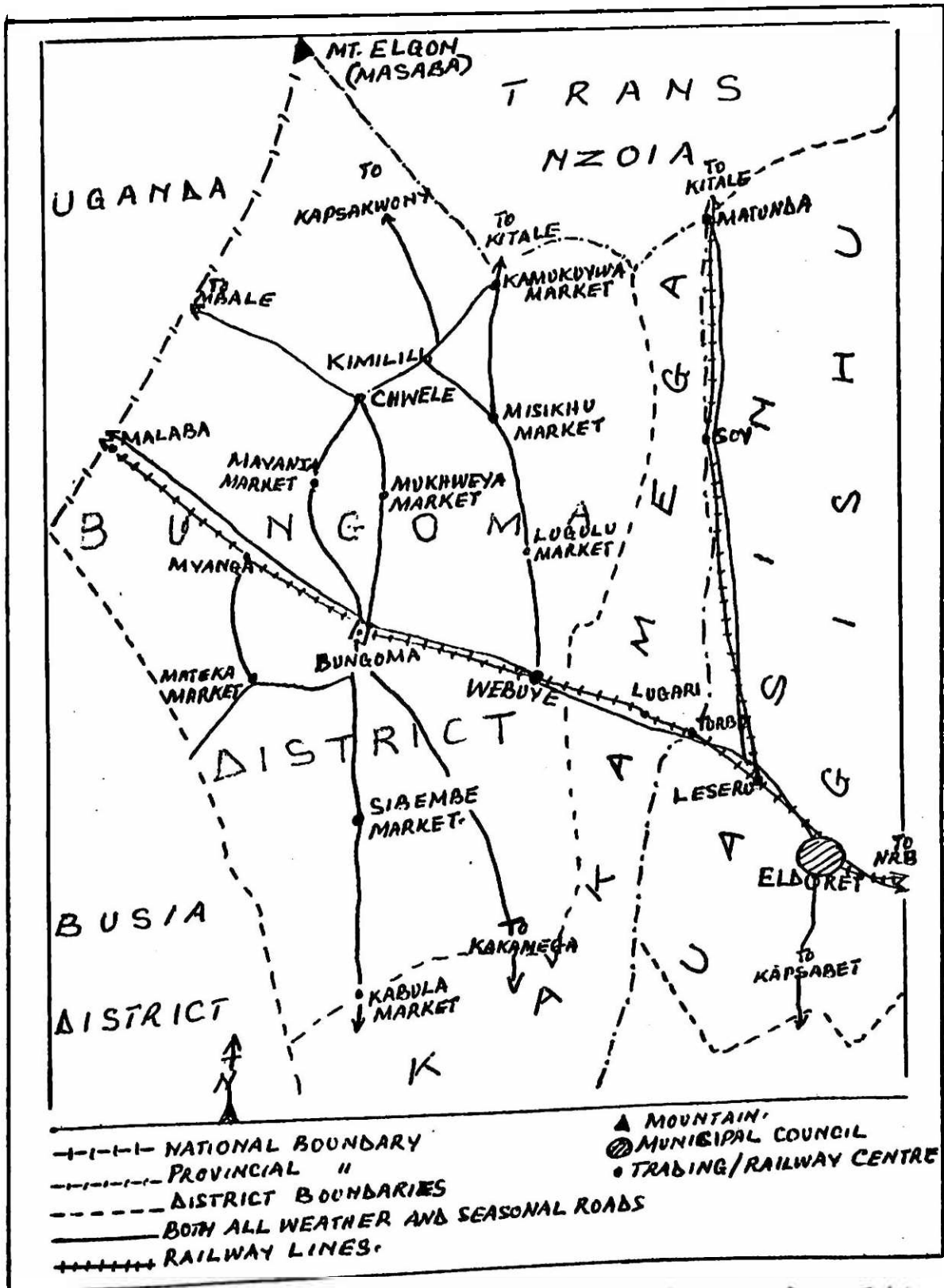
- a. Yes
- b. No

15. If other instructional (audio-visual aids) media were available in primary schools, would the chalk ("Black") board be used less in Primary school teaching in Kenya?
- a. Strongly agree
 - b. Do not agree
 - c. Not decided

16. If you were allocated thirty (30) teaching hours per week, indicate below against each instructional medium (media) how much time you would spend on each.

| | | <u>Hours/Min.</u> |
|----------------------|----------|-------------------|
| a. Teacher lectures | 1. _____ | " " |
| b. Demonstrations | 2. _____ | " " |
| c. Chalk-boards | 3. _____ | " " |
| d. Radio-broadcasts | 4. _____ | " " |
| e. Field-trips | 5. _____ | " " |
| f. Class discussions | 6. _____ | " " |

APPENDIX B:



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