THE UNIVERSITY OF MANITOBA

The Relationship Between the District Internal Mock Examination and the National Kenya Certificate of Primary Education in Assessing Standard 8 Pupils' Performance

by

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submitted to the Faculty of Graduate Studies
in partial fulfillment of the requirements
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DEDICATION

For Agnes Nyarinda,
mother of Kemunto, Maati, Moraa,
for her continued love

"The further back you look,
the further forward you can see"
Winston Churchill

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Abstract

The study was intended to determine the relationship between the District Internal Mock Examination (DIME) and the national Kenya Certificate of Primary Education in assessing standard 8 pupils' performance. The primary schools were categorised into boys' boarding (A), girls' boarding (B), single stream co-educational day (C) and multi-stream co-educational day schools (D). After being matched in terms of pupil enrolment and national KCPE performance in 1986, twelve schools from Kericho (6) and Kisii (6) were selected. DIME and national KCPE scores in English Language, Mathematics, Science and Agriculture, and Aggregate for standard 8 pupils (n=561) were analyzed.

The findings show that: a) there was a significant performance difference between DIME and national KCPE scores; b) boys' boarding schools had the highest level of performance in all dependent variables; c) girls boarding schools had lower level of performance in Mathematics; d) multi-stream co-educational day schools had relatively low performance; and, e) all correlations were in a positive direction and were statistically significant.

Although there are performance differences between DIME and national KCPE, they are significantly and positively correlated. The DIME acts as a preparatory model for

national KCPE. It is recommended that (i) DIME scores should be incorporated into national KCPE scores; (ii) each district should publish a DIME newsletter; and, (iii) initiate in-service training on measurement and evaluation. Further research areas are suggested.

Summary Outline

Chapter One, outlines the objectives of the study; the statement of the problem; the research questions and the significance of the study.

Chapter Two, discusses, first, the contextual background about Kenyan economy; the demand for formal education; and, the development of external examinations in Kenya. Second, the review of literature on the theoretical role of and criticisms about external examinations; the practice of external examinations; and, the selection options that have been tried in Third World countries. And, third, the research hypotheses are stated.

Chapter Three, outlines the study places; the research design; the nature of the information collected; the data collection procedures; the sample studied; and, the limitations of the study.

Chapter Four, presents the research findings. First the descriptive analysis is presented. Second, inferential analysis is used to test the research hypotheses.

Chapter Five, summary of the findings are presented; the educational implications are discussed; and, four recommendations are made.

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CHAPTER ONE

INTRODUCTION

OVERVIEW: This chapter, outlines the objectives of the study; statement of problem; research questions; and, significance of the study.

The objectives of the study

The main purpose of this study was to establish the performance relationship between the District Internal Mock examination (DIME) and the national Kenya Certificate of Primary Education (KCPE) examination for standard (grade) 8 pupils in Kenya. The study intended to provide useful information and insights to educational planners and administrators (ministry officials and school administrators) on how DIME performances relate to national KCPE examinations for standard 8 pupils. This was also intended to benefit the classroom teachers on understanding the role of DIME in preparing standard 8 pupils for national KCPE. And, in general, this study provides some understanding on how DIME can be used to assist classroom teachers in teaching and preparing pupils for national KCPE, assist in professional development for the teachers, and

help in improving pupil performances in the national KCPE examinations, and education in general, in Kenya.

The Statement of Problem

The KCPE is a nation-wide paper-pencil examination that is administered to standard 8 pupils by the Kenya National Examination Council (KNEC). The KCPE marks the end of the primary (elementary) schooling; and, the end for a large number of pupils who do not succeed in getting a place in government, private, or 'Harambee' (self-help) secondary (high) schools in Kenya. Basically, KCPE is the main selection yardstick, in theory and practice, for continuing schooling into secondary schools in Kenya.

In Kenya, pupils enter standard (grade) one roughly at the age of 5 to 7 years and go through a fairly wide subject-based curriculum for eight years before sitting for the national KCPE. Agriculture, History, and Religious Education are introduced in standard three; Home Science in standard 4, and Mother Tongue is dropped in standard 3 (Eisemon, Hallet & Maundu, 1986). The main rationale behind such a broad subject-based curriculum at the primary level is to 'cater for the majority of the children for whom primary education is the terminal [stress added]' (Republic of Kenya, 1984, p.4). The phraseology 'terminal' has been explained, at length, by Davies (1986) as follows:

> This is not the death blow that the word implies, but merely indicates that particular levels of schooling should be complete in themselves, and should not be seen simply as a preparation for the next stage. Those leaving the formal system after primary schooling are no longer designated 'dropouts', but as 'primary school graduates', who have acquired a sufficient range of skills for them to be economically self-sufficient or to continue learning independently (p. 198).

All the subjects taught in standard 8 are examinable. They are grouped into 6 papers as follows: English Language; Kiswahili; Mathematics; Home science, Arts and Crafts; Science and Agriculture; Geography, History, Civics and Religion. The examination papers consist of essay (especially English Language and Kiswahili) and multiple-choice items marked out of 100. The raw scores are translated into letter grades as follows: A, A-, B+, B, B-, C+, C, C-, D+, D, D-, and E. In this study these letter grades were converted into numeric values: A=12, A-=11, B+=10, B=9, B-=8, C+=7, C=6, C-=5, D+=4, D=3, D-=2, and E=1. Thus, the highest aggregate performance for a pupil is 72 points (6 x 12) and the lowest is 6 points (6 x 1). On the basis of grades on these papers, pupils are selected and allocated, firstly, to national secondary schools; secondly, to provincial and district secondary schools; and, lastly, to private and 'Harambee' secondary schools.

Generally, the quality and hierarchical categorization of secondary schools decreases in that order (Cameron &

Hurst, 1983). Most of the 'high status', national secondary schools have graduate trained teachers and fairly well equipped facilities whereas the majority of the private and 'Harambee' secondary schools have untrained staff and minimum educational facilities (Wellings, 1982, 1983). Competition for entry to the national and provincial secondary schools is stiff, only the 'top' KCPE candidates manage to secure places in these schools.

Districts and schools compete to secure the limited places for their pupils in secondary schools. The KCPE results are eagerly awaited for by teachers, parents and the students. Nearly every year the KCPE results make headline news in the local dailies. Those districts and schools which have performed well are listed; top students from each district are awarded scholarships; and, various districts award trophies to the schools with the best results as incentives and challenges to improve performance in the KCPE the following year.

Many districts are now organizing and conducting district-wide testing, here called DIME, for standard 8 students before they sit for the national KCPE. Valuable instructional time, energy and material are expended on organizing DIME as a preparatory exercise for the KCPE candidates. The main gist or thrust for the DIME is to

acquaint standard 8 pupils to the style of the national KCPE. It is also presumed that DIME provides an opportunity for teachers to compare their students with the other schools within the district before the national exams. Hopefully, teachers should use the DIME results as indicators of the level of performance in the school and areas of instructional adjustments to improve the performance of their students in the national KCPE.

Until the recent Presidential decree to confine DIME to examination classes, in Kisii district there were plans to extend the DIME to lower classes so that students can get acquainted to external testing at early stages (Staff, 1986). In Kericho district, the District Inspector of Schools sent a circular that stated:

> For pupils to be able to pass this important examination [KCPE], they have to be taught by very competent teachers who are all out to <u>produce</u> <u>the very best</u> [stress added] . . . Plans are underway to test your pupils and it is hoped that wide coverage will have been done in every subject to enable each pupil to benefit from mock test. Meanwhile you better continue to <u>ground</u> [stress added] them on how they can successfully handle any test in the future (Ministry of Education, Kericho District, 1987).

In one of the official <u>KCPE Newsletter</u> for primary science published by the KNEC, teachers were advised on the type of DIME that will produce better performances. The DIME is organized, or modelled (timetabling, printing, marking,

question items, etc), 'along the line pursued by the examination council' (Oxenham, 1982, p.76). The DIME has become one of the common strategies for preparing the pupils for the final KCPE. Yet, little research has been done to ascertain the role of DIME in predicting the performance of standard 8 pupils in the national KCPE. This thesis makes attempt to close this apparent gap. Furthermore, this thesis attempts to provide insights and data-based suggestions to educational planners and administrators for decision making; help in understanding the role of DIME and how the DIME may be adopted to improve educational and instructional performances in the classrooms; and, help in the classroom teachers' professional development for the betterment and improvement of educational standards in Kenya.

The research questions

The research intended to gather data that would attempt to answer the following research question: What is the performance relationship between the DIME scores and the national KCPE scores for standard 8 pupils in Kenya? Specifically, this research question was subdivided into the following questions:

1. Is there a significant performance difference between DIME scores and national KCPE scores for standard 8 pupils in Kenya?

2. What is the performance relationship between DIME scores and national KCPE scores for standard 8 pupils in some selected curriculum areas (English Language, Mathematics, and Science) and the aggregate scores?
3. What is the performance relationship between DIME scores and national KCPE scores for standard 8 pupils in (i) single-sex boarding, and (ii) co-educational day schools?

The significance of the study

Because a lot of instructional time, energy and material are expended on organizing and conducting the DIME it was considered important to determine the relationship between the DIME and national KCPE in assessing the performance of standard 8 pupils for the national KCPE in Kenya. The DIME has become part of the instructional activities in primary schools, and yet little scholarly research has been done to ascertain their role in predicting the pupils performance in KCPE. More importantly, the study provides more insights into the Kenyan educational system at the district level. Since DIME is organized and controlled at the district level, this study is in line with the new District Focus for Rural Development that identifies the district level as a unit for planning and recognises the

need for increased grassroot participation in development.

First, KCPE serves the largest student population in Kenya. For example, approximately four million (4,384,559) were enrolled in 12,543 Kenyan primary schools in 1984, (Eisemon, Hallet & Maundu, 1986) as compared to about 500,000 students enrolled in 2,413 secondary schools (UNESCO, 1984). KCPE is the first and last national examination many pupils sit that marks the end of their formal schooling.

Second, KCPE has the largest number of teachers and parents as immediate stakeholders. By studying DIME and national KCPE results at the district level we may be able to understand more about the Kenyan education system and be able to serve the large number of the stakeholders.

Third, all KCPE candidates sit for the common nationally normed examination papers in all the examined curricula. KCPE papers are compulsory and contribute equally to final aggregate score. It is important to find out how DIME relate to national performance because nearly all the 41 districts in Kenya have instituted districts mocks as a strategy for preparing pupils for the national KCPE. This study provided an opportunity to assess how these DIME performance relate to national grades in KCPE.

Fourth, KCPE is a 'critical selector' for secondary education; it determines which type of secondary school a pupil would attend. It is at the grassroot level (primary schools and the districts) that most of the 'groundwork' preparation for future learning is done. This study attempts to understand how the groundwork preparation is done by using the DIME as one of the indicators.

And, lastly, primary education is the largest consumer of the ministry of education's resources (UNESCO, 1984). This study attempts to gather data on the role of DIME and find out how the DIME can assist in improving educational performance at the primary level. Since DIME is organised at the lower levels (District headquarters) it is to provide a strategy for increasing rural participation as propounded in the 'District Focus for Rural Development' and provide means of improving educational performances at the district level.

CHAPTER TWO

LITERATURE REVIEW

OVERVIEW: This chapter, outlines and discusses, first, contextual background about the Kenyan economy; formal education structure; demand for formal schooling; and, development of external examinations in Kenya. Second, review of literature on the theoretical functions of and criticisms about external examinations; prevalence (practice) of external examinations; and, role of examinations and options for selection in allocating educational opportunities are presented. And, third, the research hypotheses are stated.

Kenya: Contextual Background

Kenya, a former British colony, attained its political independence twenty-five years ago. It is a tropical country located south of the Sahara stretching from roughly 4^{o}N to 4^{o}S of the Equator. Kenya lies on the western shores of the east Indian Ocean. It is bordered by Somalia to the east, Ethiopia and Sudan to the north, Uganda to the west

and Tanzania to the south. Administratively, Kenya is divided into 8 provinces and 41 districts. Nairobi is the capital and the largest city.

There are about 52 African ethnic communities, some Asians and other communities; each community exhibits its own cultural heritage, but they all live in harmony as one people. Of the Third World Countries, Kenya has one of the highest population growth rate (4.1%). The present population is estimated to be 23 million; projected to be 25 million by 1990 and 36 million by 2030 (The World Bank, 1987). Spatially, population is very unevenly distributed with more than three-quarters residing on less than one-third of the arable land in the south-western parts of the country and the coastal strip (Ojany & Ogendo, 1973; Ominde, 1984). The internal structure of the population forms a wide-based age-sex pyramid that thins sharply towards the old age cohorts. Kenya's population is largely what educational economists call 'school-age' population.

Kenya largely depends on agriculture, which accounts for over 30% of the Gross Domestic Product (GDP). The manufacturing sector (13% of the GDP) and tertiary production are marginal, and they are at their embryonic stage in absolute terms and in relation to modern industrial economies. Eighty percent of the population live in the

rural areas as small scale farmers. Urbanization is a recent phenomenon, however sprawling enormously fast. For instance, only 9% of the total population lived in urban centres in 1965, as compared to 20% in 1980 (The World Bank, 1987).

Kenya has a mixed economy. There is private ownership and state (government) enterprise as propounded in "The Sessional Paper No. 10 on African Socialism and its application to planning in Kenya". Kenya's industrial sector, it has been said, tends to lean towards capitalistic mode of production (Ake, 1981; Leys, 1975); and, has also greater trade and mutual ties with Western countries than with the Eastern economies.

Development strategies were previously centralised and co-ordinated from Nairobi, the capital city. But in the latest District Focus for Rural Development approach, regional planning and prioritization has been decentralized and delegated to District Development Committees (DDCs). The major thrust for this plan is to increase rural participation, cut down bureaucratic red tape, provide leeway for the people (the masses) to prioritize their needs and to achieve equitable distribution of development. This approach is seen as a fundamental departure from the previous plans mainly because of its decentralization

element from Nairobi, the capital, to district headquarters as centres of decision making. It is at its initial stages, there is no research data that has been gathered to assess its impact in Kenya's economy.

Kenya is a relatively politically stable state. It is a de jure one party state with an 'independent' judiciary, executive and legislature. It is a member of the Commonwealth, Non-Aligned Movement, Organization of African Unity (OAU) and the recently inaugurated Preferential Trade Area (PTA) for Central and Eastern Africa.

The cost of living index has been rising like other economies in the world. Inflation stood at 10% during 1980-85 period as compared to 7.3% for the 1965-80 period. The gross national product (GNP) per capita is estimated to be US$290 (1985). Given the uneven distribution of income (which is positively skewed) the majority of the lower-income groups live at or below the poverty line. For example, only 2.6% of the households total disposable income accrues to the lowest 20 percentile as compared to 60.4% of households total disposable income that accrues to the highest 20 percentile (The World Bank, 1987).

The formal education structure

Much of the present formal educational structure is a colonial inheritance. The curriculum content and the pedagogical styles in the present formal education system in Kenya exhibits colonial influence with modest local adaptation. English Language remains the official medium of instruction, the language of textbooks and a compulsory subject in all the selective, summative and competitive national exams. The school administration and organization (buildings, administrative hierarchies, school uniforms, etc) have the English school traditions. However, local adaptation of the curriculum has been initiated and facilitated more in lower levels (primary schools) than in higher learning institutions (university education). Enrollment figures and formal educational institutions have greatly expanded. For example, enrollment in primary schools has significantly risen from less than one million (889,553) in 1963 to nearly five million in 1985, and it is projected to rise to over seven million by 2000; secondary schools have been expanded from about 150 in 1963 to 2,413 in 1985 (Anderson, 1970; UNESCO, 1984); and there are four government maintained universities in 1988 as compared to none in 1963. Reasons behind this trend will be pursued shortly.

The school (academic) year for primary and secondary levels starts in January and runs up to December. Previously, there were 3 terms of 13 weeks and 3 breaks of 4 weeks each. This has been restructured to 2 terms of 14 weeks with 2 breaks of 3 weeks each and 1 term of 11 weeks with 5 week break. The university calendar year starts in September to June before breaking for the long 'summer' vacation. Currently, Kenya is phasing out the 7-4-2-3+ (7 years of primary, 4 of Junior secondary, 2 of Senior secondary and 3 plus of university) structure and replacing it with the 8-4-4 cycle of education. At the end of primary and secondary levels there are compulsory national certificate examinations.

Since early 1950s, the Kenyan education system has made several other changes in curriculum, length of course period and examination syndicates. The latest restructuring was adopted in 1985 and is expected to be complete by 1989. Such changes or 'swingings' are common in many countries but deemed 'radical' in many less developed countries (LDCs), particularly in Africa, as these countries search for the 'most relevant and appropriate' strategy to foster growth and development in their economies. Incidentally, and perhaps notably, the restructuring of education in Kenya is taking place when the District Focus for Rural Development is being implemented.

Education in Kenya is centrally controlled by the Ministry of Education. The Minister for Education is responsible for all policy matters concerning the ministry. The permanent secretary is the chief executive officer under whom the provincial and district education officers fall (Raju, 1973). Teachers and other subordinate staff in government maintained or assisted institutions are civil servants, but teachers and other employees in privately managed learning institutions are not. Legally, it is the responsibility of the central government officers to control and inspect all educational institutions to ensure that quality education, as a public good, is properly offered and/or taught.

The growing demand for schooling in Kenya

Since the Kenya Certificate of Primary Education (KCPE) is heavily depended upon for selection and allocation of pupils into the second level of education it is worthwhile to highlight some of the factors that have contributed to, and compounded, the growing demand for schooling in Kenya. Ten factors are hereby listed, which in one way or the other are important forces to explain the explosively growing demand for schooling in Kenya.

1. The rapid population growth rate (4.1%) - Due to the high birth rate and high fertility, decreasing death

rate and declining child mortality, the number of children maturing for 'school-age' every year is ever increasing.

2. High land pressure - In densely populated places the high population density has increased land pressure, land fragmentation, underemployment and unemployment in the rural areas. Many rural families see schooling as the 'only' alternative to ease the land pressure and means to eke out a living.
3. Unemployment - The growing unemployment among school leavers has led to what Dore (1976) calls 'the diploma disease'. Graduates of lower levels have found it difficult to get a job that a fellow graduate could get some time back. There is a growing demand for higher qualification and certification; causing a 'spiral inflation' in education.
4. Commercialization - The rapid commercialization of the economy has penetrated into formerly traditional-subsistence economies. Modern schooling, particularly the 3 Rs (wRiting, aRithmetic and Reading), have become necessary and essential in modern life styles. For example, coins and notes have replaced the cows and goats for the bride price; bottled beer has replaced the traditional 'busaa' (local brew made of cereals).
5. Change of life styles - Increasing awareness and exposure to modern life styles and change of attitudes

towards schooling. For example, many families have now accepted female formal schooling at all levels unlike before.

6. Schooling is a basic right - With the United Nations declaration and the consequent Addis Ababa Conference (1961), the Kenya government endorsed Universal Primary Education (UPE) by 1980. Kenya government has declared 8 years of 'free' primary education.
7. Colonial restriction - The restrictive colonial system left many people illiterate who now form the adult education classes.
8. Political rhetoric - The struggle for political independence had heightened the people's expectations for more and better educational facilities (Anderson, 1970), as fruits of UHURU (Kiswahili word for independence).
9. Education-and-development tier: It has been strongly argued that for a nation to develop faster it must equip its people with the necessary and modern knowledge and skills (Harbison & Myers, 1964). Education is seen as a key to growth and development (Dore, 1976).
10. Free school milk - Provision of free school milk has also attracted many children to school, especially in drought prone areas.

These factors highlight the explosive demand for

educational opportunities in Kenya. More importantly for this study, they indicate why national examinations are relied upon for selection and allocation of the available educational opportunities. The national examinations are highly regarded; and, thus, intensive preparations made for the national examinations so as to secure the limited opportunities in the educational ladder. At primary level, the DIME form one of preparatory exercises in many schools and districts in Kenya.

By all standards, schooling in Kenya is a growing industry. There are large enrollments at all levels. It is a major single department employer in terms of teaching staff, auxiliary and back-up personnel, and administrators. The number of pupils and students engaged in school form a very significant proportion of the total population. In schools, congestion (over enrollments) has become common. The teacher-student ratio is very high; in many schools the ratio approaches 1:50 or more.

The Ministry of Education is one of the largest consumer of government current expenditure. For example, in 1982 the education sector took about 20.5% of the current government expenditure which was 16.6% of the total government expenditure (UNESCO, 1984). Most of these funds are spent on primary education. According to the UNESCO (1984) figures, 63.8% of the Ministry of Education's budget

in 1982 was apportioned to primary level. The latest proposal for cost-sharing is a response to the escalation of educational cost that has continued to heavily drain the government (Staff, Aug. 26, 1988). Therefore, it can be seen that education in general, and primary level in particular, is a great concern to the Kenya government and parents as Kenya endeavors in its socio-economic development.

Development of external exams in Kenya

The Kenyan education system is marked by external examinations that differentiate one level of schooling from the other. The external exams are the basis, in theory and practice, of selection and allocation of educational opportunities from primary to secondary, and from secondary to university and post-secondary (tertiary) learning institutions. Given the explosive demand for schooling in Kenya, competition for these opportunities is very high. The requirement is not just passing, but passing highly to secure a place in 'high status' national secondary schools and tertiary higher learning institutions.

External examinations as much as formal education in Kenya date back to the colonial period. For instance, following the Beecher recommendation in England after the Second World War, the following external exams marked the four levels of schooling between 1950 and 1960:

Primary:	Standard 1
	" 2
	" 3
	" 4 Common Entrance Examination (CEE)
Intermediate:	Standard 5
	" 6
	" 7
	" 8 Kenya African Primary Education (KAPE)
Secondary:	Form 1
	" 2 Kenya African Secondary Education (KASE)
	Form 3
	" 4 Cambridge School Certificate (CSE) or London General Certificate Education (LGCE).
	Form 5
	" 6 Higher School Cert. (HSC or 'A' level)

Immediately after independence the Education (or Ominde) commission (1965) recommended that CEE be abolished and the length for primary education be reduced to seven years. From 1967 to 1985 the segmentation was as follows:

Primary:	Standard 1
	" 2
	" 3
	" 4
	" 5
	" 6
	" 7 Certificate of Primary Education (CPE).
Secondary:	Form 1
	" 2 Kenya Junior Secondary Education (KJSE). *Abolished in 1980.
	Form 3
	" 4 East African Certificate of Education (EACE). *Later changed to Kenya Certificate of Education (KCE).
	Form 5

	"	6	East African Advanced Certificate of Education (EAACE). *Changed to: Kenya Advanced Certificate of Education (KACE).

The new 8-4-4 system inaugurated in 1985, will be structured as follows by 1989:

Primary	Standard	1	
	"	2	
	"	3	
	"	4	
	"	5	
	"	6	
	"	7	
	"	8	Kenya Certificate of Primary Education (KCPE). *From 1985.
Secondary:	Form	1	
	"	2	
	"	3	
	"	4	Kenya Certificate of Secondary Education (KCSE). *From 1989.

Unlike the previous education segmentation, the present format, commonly called "8-4-4 system", has the shortest formal (primary and secondary) schooling before reaching university level. But as in the previous structure of education, the external examinations continue to be the sole criterion for selection and allocation of educational (and employment) opportunities, albeit acquiring local acronyms.

It is, perhaps, proper to highlight some of the reasons why the Kenyan system depends on these external exams. First, the formal education structure is a colonial inheritance. The present educators and major policy makers were schooled during this era. Instead of an overnight

restructuring of the system, educational educators and planners in Kenya seem to have adopted gradual modification. Examinations have gradually changed hands from external bodies (Cambridge and Oxford) via the regional East African Examination Council (EAEC) to the present national unit KNEC. Second, Kenya receives some substantial financial and technical assistance in education from various western economies, especially Britain, where external examinations; are commonly practiced. Third, the high demand for formal education has necessitated the use of external examinations as a sifting mechanism for certification, selection and allocation. The grades or scores awarded by these examinations are, to a large extent, the yardstick for selection and allocation of educational and employment opportunities. Fourth, abolishing external examinations for new reforms, like students profiles, as Thompson (1981) has argued

> may demand expertise in examining which is not necessarily available and the reformed system might not command the same degree of public confidence in its impartiality as the present system (p. 163)

A large percentage of teaching cadre in Kenya are largely untrained, and fragmented, such that it is difficult to rely on internal teacher assessment. Furthermore, there is uneven regional distribution of the trained teaching staff. Last, but not least, the external examinations are seen as a

better way of curbing the rampant tribal inclination and nepotism, and assisting in national unity (integration).

Theoretical functions of external exams

First, examinations provide achievement benchmarks in form of grades (A, B, C, D, etc) to indicate the pupil's success. These benchmarks enable us to receive feedback on the pupil's progress and achievement (Mortimore & Mortimore, 1984). It is argued that without these 'check points', in the form of exams, we would not be able to measure what the pupils have learnt. Examinations at the end of the coursework or at the end of the year serves as a means for assessing 'all' that the pupils have mastered up to date. This performance can be compared with others of the same level (group-normed) or compared to the content level (criterion-referenced). In each case, the individual pupil is ranked relative to either his/her peers or the content level. More so, when the assessment is done by an external examiner we presume that the pupils have been objectively rated. The external examiners' assessment are used mostly to award certificates that are to be used after school as evidence or qualification of the educational level attained.

Second, when examinations are nationally-assessed they provide information for monitoring and comparing achievement

and performance between schools and regions in the country. Schools and regions are ranked to get the 'feel' of performance across the country (Staff, 1987). Performances differ from one school to another, from one region to another. Such information can be analyzed to identify the trends (and causes) of unequal performance. This analysis could help educational planners, hopefully, to take necessary remedial steps to balance the distribution of educational resources and opportunities.

Third, external examinations provide 'objective' means of identifying and rewarding merit. When students are assessed by external examiners, we hold that there will be no undue influence; marking and standardization are presumed to be fair and exact on the pupil's ability. The grade assigned is what the candidate deserves. In other words, the candidate merits to be given that grade. Since this is bias-free, selection based on these grades is perfectly meritocratic. That is, there is no possibility of nepotism or tribalism. Selection for the next educational level is a reward: pupils fairly contest and only those who merit move up the educational ladders. The upward educational promotion is, presumed to be, by fair contest (Turner, 1961).

Fourth, external examinations can serve to increase

motivation to teachers (Mortimore & Mortimore, 1984). When schools are ranked and judged to be good performing institutions by the public, this is likely to increase the teachers' morale. As Turner (1984) argues, teachers become proud of their students performance when the results are good. The corollary, then is that teachers in poor performing schools are challenged to work hard to improve their students performance so that they can also rank at the top, at least one day.

Fifth, Hargreaves (1982) argues that nation-wide external examinations provide equal opportunity and competition for pupils regardless of their socio-economic-status (SES). Hargreaves contends that such examinations open opportunities for bright pupils from poor families to move up the SES. Especially when there is fair, meritocratic selection for educational and employment opportunities. Thompson (1981) says that

> Since large number of schools share a common allocation function, that is that their pupils are all competing for access to the next level of education [or to the world of work], it has usually been found necessary to set a common external examination (p.162).

Ideally, an education system that operates on common, public, external examination is supposed to provide all participants an equal chance for selection, allocation and promotion in educational and employment opportunities by

using examination grades. Thus, these examinations ; are supposed to assist in social integration by minimizing class differentiation.

Sixth, external examinations can be seen as a source of social control in the school. Examinations may provide pupils with a powerful incentive to work, just at the age when they are becoming more resistant to the discipline of school and home, and more susceptible to distractions far removed from study (Mortimore & Mortimore, 1984). Hargreaves (1982) and Turner (1984) have argued that examinations provide the teacher and the school administrator an extra, outside force to contain their pupils. When students are made to see the importance of examinations and success in their life outside the school they are likely to have a positive, instrumental, attitude towards schooling. Although not all would conform (Turner, 1984), it at least works well for many students (Hargreaves, 1982).

Criticisms about external examinations

Briefly, and by purpose, criticism that are commonly levelled at external examinations will now be outlined. These criticisms can be categorised into four groups. First, the criticisms on the nature of external exams. It is argued that, external examinations lack reliability on

the grades awarded to pupils (Schools Council, 1979); they lack comparability between subjects and over different periods of time (Quansah, 1985); they highly depend on the normal distribution statistics; and, external examiners do make marking errors at expense of the candidates. Furthermore, external examinations are expensive to operate and co-ordinate in large areas.

Second, criticisms on the impact of external examinations on students. It is argued that, external examinations instill a sense of failure to pupils, sense of rejection by damaging self-confidence and self-esteem (Brophy & Good, 1974; Hargreaves, 1967; Lacey, 1974) and they increase examination anxiety in students thus cause sleepless nights, like "the frozen rabbit" (Ryle, 1969). They also encourage competition, individualization and stratification of pupils into 'successfuls' and 'failures'.

Third, criticisms on the influence of external examinations on the instructional (pedagogical) activities in the schools. It is argued that, external examinations influence and tend to propel the classroom pedagogical styles by encouraging rote memorization and drilling (Freire, 1970). They inhibit the teacher's autonomy on curriculum implementation, teachers teach for examination

purposes: 'What they test monopolizes instruction and learning; what they do not test is neglected, even discarded' (Oxenham, 1982, p. 72). More concretely, Thompson (1981) has argued

> the existing examination system places a premium upon the accumulation of knowledge and does not encourage schools to teach their pupils to use their knowledge other than in an examination (p. 163).

Fourth, and last, it is argued that, external examinations perpetuate or reinforce the status quo. The assumption of equal accessibility and contest mobility (pure meritocratic selection) is a misnomer. The disadvantaged remain to perform poorly in public examinations(Bowles & Gintis, 1976; Taylor & Ayres, 1969). In other words, the public examinations acts as social control in society, by sieving or sorting students (into failures and successfuls) for educational (and employment) opportunities.

These criticisms clearly lean to convince us that external examinations are a menace, a black spot and an enemy of learning in particular, and for education in general. Not surprisingly, the deschoolers, as championed by their 'Guru' Ivan Illich (1971), have categorically denounced schools, the examinations and their selective evils. Husen (1979) has summarised Illich's views as follows:

> The school, particularly in the Third World, is serving only the elite in the modern sector and is degrading those who are in the traditional sector; it is reinforcing the meritocratic element in society by participating in a repressive ritual of upward social mobility. The masses are lured into believing that education is a status-providing and liberating instrument, whereas it simply serves to make them addictively dependent on the services of a formal system of education (p. 25).

In the words of Bowles and Gintis (1976), they say 'Education reproduces inequality by justifying privilege and attributing poverty to personal failure' (p. 114). Karlekar (1983), who examined education system in India, is also of similar view:

> Culturally prescribed norms convert differences into inequalities:... The grading of differences is the logical justification for the contemporary division of labour with its differential system of payments (p. 183).

In other words, pupils utilize and exchange their labour for objects: 'grades or examination certificates are the metaphors for wages. [Thus, pupils] are transformed into product commodities to be sold on the market' (Sarup, 1978, p. 139 - 140). Freire (1970), probably as one of the leading critics of education systems in the developing countries, argues that an education system that depends highly on external examinations dehumanizes learning. The teacher becomes the depositor of knowledge from which the learners adroitly and meekly receive knowledge as depositories. The learners, like robots, are expected to reproduce the stored knowledge as it was 'put in' by the

teacher for the external examiner. Dore (1976) has also argued that a system of education that highly depend on examinations for selection and allocation of opportunities for education and employment will face an escalation of certification (spiral inflation in education) that leads to disillusionment in schooling.

The foregoing analysis, views problems in education go beyond mere reorganization of examinations. They see education, and schools as 'powerless' in addressing social and economic inequalities in societies. Therefore, the fundamental solutions for problems in education lie in the society at large; what we need is to make a completely fresh start from the society as a whole. Abolition of external examinations is only one of them, but a piecemeal modification if done in isolation. Nevertheless, large amount of literature reviewed shows that external examinations are not only being practiced but are also highly regarded by the public as generally impartial for selection; and, continue to hold a strong grip on education systems.

Practice of external exams

A general survey on different education systems elsewhere indicates that external examinations are not only

being used but they are also being reintroduced where they had been abolished. In a recent survey on student evaluation in different provinces across Canada, Mclean (1985) found out that:

> provinces and districts are turning to [external] examinations as a substitute for the program consultants and inspectors that used to assist with quality control in schools (p. 47).

In the United States, A Nation at Risk, the National Commission on Excellence in Education (NCEE) (1981) observed that the standards of education had deteriorated until the system had become cafeteria-style curriculum in which the appetizers and desserts can be easily mistaken for main courses. The commission recommended, among other changes, that standardized tests (not to be confused with aptitude tests) should be administered at major transition points. After fairly lengthy discussion on the evolution of British examination systems, Mathews (1985) remarks that

> Revolutionary change, even abolition are possible, but with recent example of China in mind, even the most militant opponents may opt for evolutionary extinction of the examinations dinosaur (p. 42).

External examinations are an instrument, a tool and a servant of an education system (Mortimore & Mortimore, 1984) as much as education is to a society and an economy as a whole. Mathews (1985) puts this view more concretely:

> Examinations are no more or less fair than schools are fair, or society is fair. If unfairness there

> be, it lies in fixing the blame for the inequities of society on educational system in general and the examination system in particular. For many years now both have served as whipping boys, conveniently institutionalized, serving to deflect blame from where it properly lies: with the actions and attitudes of us all (p. 136).

It can also be posited that when we strive for universal primary education (UPE) without adequate openings in second levels of education, the legitimization of external examinations for selection is apparent. Mathews (1985) provides us with one fundamental reason for the continuity of external exams:

> [There is] no reason for the abolition of examinations for the period of compulsory education; but there is a good case for radical change in their scope, how they operate . . . They remain a sure shield against the abuses of patronage and political, racial and sexual bias (p. 242).

Furthermore, abolishing external examinations may demand expertise that is not currently available and requires time to 'command the same degree of public confidence in its impartiality as the present system (Thompson, 1981, p. 163).

Examinations and selection options

Nearly everyone knows that tests or examinations for selection are a regular part of teaching and schooling. Bray (1985) has reviewed nine selection procedures that have been attempted in different places in Less Developed

Countries in the last two decades. These procedures are (a) pure examination (pure meritocracy); b) regional quota selection; c) character and/or political assessment; d) continuous assessment; e) religious affiliation; f) race and ethnical background; g) personal considerations; and, h) "back-door" or bribes. After a fairly detailed review of merits and demerits of each selection option, Bray (1985) concludes that:

1. character and/or political assessment have generally failed because they are 'too vulnerable to manipulation' (p. 229);
2. it has proved hard to dispose of examinations because they are still highly regarded and widely considered as objective and neutral;
3. examination based selection is popular among the urban-based elitists and civil-cum-political leaders;
4. quota selection has been accused of excessive decline in academic achievement; and,
5. where quota selection has been attempted, "back-door" entry has been used to serve the ruling elitists.

In Kenya, the new 8-4-4 system tries to de-emphasis the dependence on external examinations for selection (Republic of Kenya, 1984). There are proposals for continuous

assessment and character-based assessment as components for selection into secondary schools. There is also a proposal to have regional quota selection for the standard 8 pupils into secondary schools.

Selection of primary candidates into secondary schools based on KCPE scores and the accordant consequences have attracted a number of educational researchers in Kenya (Somerset, 1974, undated; Wellings, 1982, 1983). Somerset (undated) found that the correlation between KCPE (formerly CPE) and secondary school performance in KCE (formerly EACE) varies between '0.4 and 0.7 showing that in fact there is some tendency for those who do best in the selection examination to continue doing best in secondary school' (p. 60). However, a further scrutiny of the correlation that takes into consideration the category of the secondary schools the pupil attends, Somerset (undated) found that the correlations:

> drop to 0.2, which is hardly anything. What the [K]CPE selection examination is doing is not predicting success in the East African Certificate Examination (now Kenya Certificate Examination). It is predicting the grade [category] of secondary school you enter. (p. 60 - 61).

In other words, students who join the high status, national secondary schools have higher chances of passing the KCE than those who join the 'low status', private and Harambee secondary schools. As early stated, the high status secondary schools have more educational facilities that

facilitates learning and increases chances of performing well in the national examinations.

The consequences of KCPE (placement) have been clearly illustrated and discussed by Wellings (1982, 1983) who found out that those pupils who failed to secure places in government secondary schools have a very slim chance of reaching university level. For example, in 1978 only 8 out of 125 students (6.4%) enrolled in Geography department at the University of Nairobi (Kenya) had come through 'low status' secondary schools. Yet, these schools had 60% of the national enrollment at that time. Somerset (1974) has strongly argued that performance after KCPE (formerly CPE) depends on the type of secondary school a student attends. Those who enter high status secondary schools, with well equipped facilities and trained teachers, have a high chance of performing well and succeeding to get a place in the university level. As Wellings (1982) analysis shows, those who attend 'high status' schools were highly represented (46.4%) in the Geography department University of Nairobi in 1978, although they come from a small national population (7.6%). Parents, teachers and pupils know that when one succeeds in entering a good secondary school s/he has a chance of succeeding to university.

Apparently, the KCPE selection predetermines the path

for ones future schooling in Kenya. With this in mind, it is logical to understand the importance that is attached to KCPE by parents, teachers, and pupils in Kenya. There are intensive preparations made for KCPE by parents, teachers, education officers, and the pupils themselves. The DIME have become one of the strategies for preparing the standard 8 pupils for the national KCPE. This thesis attempts to come to grips to ascertain the role of DIME in predicting the performance in the national KCPE. To restate the research question: "To what extent does the DIME performance relate to performance in the national KCPE?"

At the secondary level, Arap-Maritim (1987) has indicated that school-organized mock examination (SOME) correlate positively with the national Kenya Certificate of Education (KCE). This study makes attempt to study how DIME relate to national KCPE at the primary level. The following research hypotheses were derived from this study.

The Research Hypotheses

1. It was hypothesized that there is a significant performance difference between DIME and national KCPE scores for standard 8 pupils in Kenya.

2. A. It was hypothesized that the performance relationship between DIME scores and national KCPE scores for standard 8 pupils in some selected curriculum areas

(English language, Mathematics, and Science) would have positive correlational coefficients.

2. B. It was hypothesized that the performance relationship between DIME aggregate scores and national KCPE aggregate scores for standard 8 pupils would have positive correlational coefficients.

3. A. It was hypothesized that the performance relationship between DIME scores and national KCPE scores for standard 8 pupils in single-sex (boys only and girls only) boarding schools would have positive correlational coefficients.

3. B. It was hypothesized that the performance relationship between DIME scores and national KCPE scores for standard 8 pupils in co-educational (mixed) day schools would have positive correlational coefficients.

CHAPTER THREE

METHODOLOGY

OVERVIEW: This Chapter presents this study's location, research design, nature of information (data) collected, data collection procedures, sample studied, and limitations of the study.

Study places

The study was conducted in two districts in Kenya, namely, Kericho (Rift valley province) and Kisii (Nyanza province). The two districts are similar in many physical, social and economic characteristics. The two districts were selected for the study because, first, they are basically rural districts as are many other parts of Kenya and, secondly, it was considered necessary to have two districts from different provinces that are neighbors and easily accessible so as to operate within the limited financial resources available.

Research Design

In terms of design, this study was essentially a 2x4 mixed within-subject design: 2 types of examinations, 4 categories of schools, and pupils' performances scores in

English Language, Mathematics, Science and Aggregate results (4 response variables) for 1986. (Note: the four response variables would be analyzed independent of one another, and details about the classification of schools is outlined under 'The study sample' below).

Types of Data Collected

The types of information collected included pupils' index number (which also indicated the district and the school); the pupils' gender; and, the pupils' performance in the District Internal Mock Examination (DIME) and national Kenya Certificate Primary Education (KCPE) in three curriculum areas (English Language, Mathematics and Science) and aggregate results for 1986.

The pupils' scores in the selected curriculum areas and aggregate results are the dependent (response) variables. These three curriculum areas were selected because they are important curricula areas. English language is the medium of instruction, and, they are all compulsory subjects in secondary schools. The aggregate scores are important because they determine the pupils' selection into secondary schooling.

Data Collection Procedures

Schools were classified into four categories: category A - boys' boarding schools; category B - girls' boarding

schools; category C - single stream (in standard 8) co-educational day schools; and, category D - multi-stream (more than one stream in standard 8) co-educational day schools.

Schools from the two districts were matched in terms of (i) the total school enrollment; (ii) the standard 8 enrollment; (iii) the number of teaching staff; and (iv) the position ranking in 1986 national KCPE results. The school data sheet presented in Appendix A was used. This was done at the district education offices in Kericho and Kisii with the assistance of District Inspectors of Primary Schools. Where several schools equally qualified for all these characteristics simple cluster randomization was used to select the sample schools for each category. The DIME and national KCPE results were collected from the sample schools and the district examination offices, respectively.

Sample Studied

Twelve schools (6 from Kericho and 6 from Kisii) were studied. Table 1 summarizes the number of the total staff, the standard 8 enrollment and the total pupil enrollment for the schools studied in each classification. For categories A (boys' boarding) and B (girls' boarding) only one school from each district was selected; because, there was only one school for these categories in Kericho district. For categories C and D two schools were selected from each

district: Kericho - 4 and Kisii -4 schools.

After the KCPE and DIME results were juxtaposed for each pupil from all the twelve schools, only those pupils who had grades recorded both in the national KCPE and the DIME for all the four response variables were selected. Out of a total of 651 standard 8 pupils; 561 (86.1%) qualified for analysis for the study. Table 2 summarizes the distribution of the standard 8 pupils from each district by category. The two districts were equally represented: Kericho - 49.91% and Kisii - 50.09%. In terms of gender (sex), presented in Table 3, the sample study had 56.86% boys and 43.14% girls.

Limitations of the study

First, since this study's location were not randomly selected, by all means we cannot assume that findings to be generalizable to other district areas in Kenya with different physical and socio-economic environment. Second, the study is limited to the relationship between the DIME and national KCPE in assessing standard 8 pupils' performance in the two districts. We cannot generalize on the factors that contribute to the level of performance in the KCPE and the level of influence of DIME on that performance.

CHAPTER FOUR

THE FINDINGS

Overview: This Chapter first presents descriptive analyses (frequency distributions, minimum and maximum score performances, means and standard deviations, and mean differences) which are charted to provide an overview of the findings. Second, inferential analysis (analysis of variance), mean performance and mean difference comparisons, and correlations are presented to test the research hypotheses.

DESCRIPTIVE ANALYSES

Procedure of Descriptive Analyses

This section presents the descriptive overview of the standard 8 pupils' academic achievement performance in the District Internal Mock Examination (DIME) and national Kenya Certificate of Primary Education (KCPE) in English Language, Mathematics, Science and Agriculture, and Aggregate score. The frequency distributions, expressed in percentages, are presented in Tables 4 through 8. In the three curriculum areas pupils' achievement scores were classified into two

groups: 1-6 scores as low performance; and, 7-12 scores as pass performance. The aggregate scores were classified into five groups: 6-24, 25-36, 37-48, 49-60, and 61-72. Overall, all the four school categories (A, B, C, and, D) experienced an increase in percentage pass performance (7-12) from DIME to national KCPE for English Language, Mathematics, Science and Agriculture; and, increase, in percentage, for higher Aggregate scores (49 and above).

Frequency Distributions

The frequency distribution of the pupils' scores for English language, Mathematics, Science and Agriculture during the DIME and national KCPE are charted in Tables 4 through 7. As shown in Table 4, in English Language 71.48% of the pupils were graded 6 and below in the DIME, but in the national KCPE 71.29% of the pupils scored 7 and above. English Language had the highest percentage pass 71.29% (7 and above) during national KCPE. Table 4 shows that, in Mathematics, the performance in the DIME was low: 75.04% had 6 and below as compared to 24.96% who were graded 7 and above. Mathematics had lowest percentage pass (45.81%) of the three curriculum areas during national KCPE. Table 4 also shows that, in Science and Agriculture 74.68% scored 6 and below, and 25.32% scored 7 and above in the DIME. But, during national KCPE this percentage changed to 49.37% and 50.63%, respectively. In other words, there was a change in

pupils' performance in Science and Agriculture in national KCPE as compared in the DIME.

As shown in Table 5, schools in category A (boys' boarding) had the highest percentage pass in English Language followed by B (girls' boarding), C (single stream co-educational day) and D (multi-stream coeducational day) schools. Table 5 shows that, in all school categories (A, B, C, and, D), there was an increase in percentage in performance for the national KCPE in English language. Table 5 also shows that, all four categories had a decrease in the national KCPE percentage for the pupils who had lower scores (6 and below).

Table 6 shows that, in all four school categories (A, B, C, and, D), there was an increase in percentages of the pupils who had 7 and above, and a decrease for those who had 6 and below on the national KCPE mathematics examination as compared to performances on the DIME. Only about one quarter (24.96%) scored 7 and above on the DIME as compared to about half (45.81%) in the national KCPE examination. Category A (boys' boarding) had the highest percentage performance while category B (girls' boarding) had lowest percentage pass (7 and above). That is, 81.23% of pupils in boys boarding school obtained grades 7 and above, while only 31.41% of the pupils in girls' boarding schools had these grades in the national KCPE examination.

Table 7 shows that, while nearly three quarters

(74.68%) of the pupils had low performance (6 and below) in Science and Agriculture on the DIME, this number decreased to a half (49.37%) during national KCPE. In other words, there was a change in the national KCPE performance in Science and Agriculture as compared to performance on the DIME. Both school categories had an increase in percentage pass performance: with category A (boys boarding) having the highest percentage pass (7 and above) followed by C, B, and D, in that order.

Table 8 shows that, the modal class for schools in category A is the highest in the two examinations: 49 - 60 for DIME, and 61 - 72 for national KCPE. This indicates that standard 8 pupils in category A performed fairly well in the DIME (52%), and tended to perform even better in the national KCPE examination (76%). This is indicated by the shift of the modal class from 49 - 60 class on the DIME to 61 - 72 points on the national KCPE. The aggregate score performance on the DIME tends to be positively skewed: a large percentage of standard 8 pupils scored 36 points and below, especially for categories B, C and D. On the other hand, the aggregate performance in the national KCPE examinations tends to be unimodal: a large percentage of standard 8 pupils fall between 37 - 48 class - which may be called an <u>average</u> performance, except for category A which is <u>above</u> average. All the four school categories experienced an increase in the number of pupils who scored

49 points and above in the national KCPE as compared to the DIME. The interpretation of this findings would be discussed in Chapter Five.

Minimum and Maximum Performance

The minimum and maximum scores on the DIME and national KCPE, presented in Table 9, indicate that, first, all schools had pupils with varied achievement abilities. Pupils' performance range from 1 (lowest score) to 12 (highest) on the DIME and national KCPE examinations. The multi-stream co-educational day schools had pupils spread across all levels of performance in all the curriculum areas. Second, girls boarding schools had relatively smaller range (7 points) in English Language (min.=5, max.=12) and Science and Agriculture (min.=4, max.=11). Girls' boarding schools had the highest starting point in English Language and Science and Agriculture. Third, girls boarding schools did not have pupils who scored maximum points (12) on the DIME in Mathematics and Science and Agriculture. Fourth, in Aggregate score performance, girls' boarding schools had the highest minimum (26 points) and lowest maximum (63 points) on the national KCPE, while boys boarding schools had the highest maximum (72). Multi-stream co-educational day schools had the lowest minimum Aggregate scores on the DIME (9) and national KCPE (7). The interpretation of these findings are discussed in Chapter Five.

Mean Performance

The mean, standard deviations, and mean differences for English Language, Mathematics, Science and Agriculture, and Aggregate Scores for the two examinations were computed. The results are summarized in Tables 10 and 11. Mean performance on the DIME were generally lower than on the national KCPE; and, hence, mean differences (KCPE minus DIME) are all positive.

On the DIME, the mean performances for English Language ranged from 4.70 (SD=1.95) in category D, to 8.29 (SD=3.36) in category A; Mathematics ranged from 4.42 (SD=2.19) in category B, to 7.00 (SD=2.46) in category A; Science and Agriculture ranged from 3.74 (SD=2.28) in category D, to 7.69 (SD=1.87) in category A; and, Aggregate score ranged from 32.07 (SD=8.17) in category D, to 48.12 (SD=10.49) in category A.

On the national KCPE, the mean performances for English Language ranged from 7.48 (SD=2.33) in category D, to 9.55 (SD=2.05) in category A; Mathematics ranged from 5.75 (SD=2.45) in category D, to 8.89 (SD=2.41) in category A; Science and Agriculture ranged from 5.96 (SD=2.45) in category D, to 9.29 (SD=2.36) in category A; and, Aggregate score ranged from 39.36 (SD=11.71) in category D, to 56.12 (SD=11.93) in category A.

In summary, it seems that category A (boys' boarding)

schools had higher mean performance and category D (multi-stream co-educational day) schools had the lower mean performances. These performance differences were tested for statistical significance and, the details are discussed below.

INFERENTIAL ANALYSIS

Summary of the inferential analysis procedure

The mean performance and mean difference for English Language, Mathematics, Science and Agriculture, and Aggregate scores are presented in Tables 10 and 11. First, the overall analysis of variance (ANOVA) for mean performances and mean differences were computed; and, the results were statistically significant ($F(24, 1595.77)=17.38$, $p=0.0001$ and $F(12, 1466.04)=14,02$, $p=0.0001$, respectively). Second, separate ANOVAs for each curriculum area and aggregate score in the two examinations were computed and the results are charted in Tables 12 through 23. The results were all significant ($p=0.0001$). Third, the mean performance and mean difference for each curriculum area and aggregate score for the school categories (A, B, C, and D) were compared, by using Duncan's Multiple Range Test, and the results are summarized in Tables 24 through 35. The Duncan Multiple Range Test was preferred because of the unequal size among the four school categories; ranks the

means; and, controls the Type I comparisonwise error. Last, the pearson correlations (r) between the DIME and the national KCPE for each curriculum area and aggregate score were computed and the results are presented in Table 36. The correlations were all significant (p=0.0001). These correlations were computed to determine the performance relationship between the DIME and the national KCPE for English Language, Mathematics, Science and Agriculture and Aggregate score.

Details of the inferential analysis

Each curriculum area and aggregate score are discussed separately: starting with English Language; followed by Mathematics; Science and Agriculture; and, Aggregate performance. This order and separation were preferred mainly for organizational and clarity purpose.

English Language

The ANOVA for English Language on the DIME, presented in Table 12, indicates that there is a significant simple main effect ($F(3, 557)=66.06$, $p=0.0001$). The mean comparisons for the school categories A, B, C, and D, presented in Table 24 shows that, categories A and B are not significantly different from each other ($p>0.01$); category C is significantly different from A, B and D ($p=0.01$); and, category D is significantly different from A, B and C

(p=0.01). Thus, on the DIME, single-sex boarding (categories A and B) schools had higher level of performance as compared to the co-educational day (categories C and D) schools.

The ANOVA for English Language on the national KCPE, presented in Table 13, shows a significant simple main effect ($F(3, 557)=22.17$, $p=0.0001$). The mean comparisons for school categories A, B, C, and D, presented in Table 25, shows that, on the national KCPE examination categories A and B are not significantly different from each other ($p>0.01$); categories B and C are not significantly different from each other ($p>0.01$); and, category D is significantly different from A, B and C ($p=0.01$). This means that on the national KCPE examination single-sex boarding (category A and B) schools had higher mean performance, but the girls boarding (category B) did not significantly differ from single stream co-educational day schools.

The ANOVA for the mean difference, presented in Table 14, shows that, there is a significant simple main effect ($F(3, 557)=19.25$, $p=0.0001$). This means that standard 8 pupils' performance on the DIME and national KCPE are significantly different. The standard 8 pupils had higher scores on the national KCPE examinations than on the DIME. This supports the research hypothesis that, there is a significant performance difference between the DIME and national KCPE in English Language for standard 8 pupils.

The mean difference comparisons between the school

categories A, B, C, and D, presented in Table 26, shows that categories A and B are not significantly different from each other ($p>0.01$); categories C and D are not significantly different from each other ($p>0.01$); but, categories A and B significantly differ from categories C and D ($p=0.01$). This means that for English Language standard 8 pupils in single-sex boarding (category A and B) schools had a relatively smaller performance difference between DIME and national KCPE as compared to the co-educational day (category C and D) schools. Although, the single-sex boarding schools had the highest mean performance on the DIME, and maintained that lead on the national KCPE examination, these schools experienced a relatively smaller mean difference, about 1 point, as compared to the co-educational day (category C and D) schools, which have over 2 points. It seems that standard 8 pupils in single-sex boarding schools had a relatively smaller performance increase from the DIME to national KCPE in English Language than those in co-educational day schools.

Mathematics

The ANOVA for mathematics, presented in Table 15, shows that there is a significant simple main effect ($F(3, 557)=24.38$, $p=0.0001$). The mean comparison for the school categories A, B, C, and D, presented in Table 27, shows that in the DIME, category A is significantly different from

B, C and D (p=0.01); category C is significantly different from A, B and D (p=0.01); and, categories B and D are not significantly different from each other (p>0.01). Thus, on the DIME boys' boarding (category A) schools had higher mean performance in Mathematics, followed by single stream co-educational day (category C) schools, multi-stream co-educational day (category D), and, last, girls boarding (category B) schools. This supports the observation made about the frequency distribution: boys' boarding schools had 81.23% of pupils with 7 and above scores, while girls' boarding schools had 31.41%.

The ANOVA for mathematics on the national KCPE, presented in Table 16, shows that there was a significant simple main effect (F(3, 557)=46.34, p=0.0001). The mean comparison for the school categories A, B, C, and D, shown in Table 28, indicate that in Mathematics on the national KCPE, category A is significantly different from B, C and D (p=0.01); category C is significantly different from A, B and D (p=0.01); but categories B and D are not significantly different from each other (p>0.01). This means that on the national KCPE boys boarding (category A) schools had the highest mean performance in Mathematics, followed by single stream co-educational day (category C), and then, girls boarding (category B) and multi-stream co-educational day (category D) schools. As observed in Table 6, category A had the highest percentage (81.23%) pass performance, followed

by category C (66.65%), category B (31.41%) and category D (31.06%).

The ANOVA for the mean difference, presented in Table 17, show that, there was a significant simple main effect ($F(3, 557)=9.99$, $p=0.0001$). This indicates that there is a significant performance difference between DIME and national KCPE in Mathematics. That is, on the national KCPE examinations standard 8 pupils had higher scores than on the DIME. This supports the research hypothesis that, there is a significant performance difference between DIME and national KCPE scores in Mathematics for standard 8 pupils.

The mean difference comparisons for the school categories A, B, C, and D, shown in Table 29, indicate that, in Mathematics categories A, B and C are not significantly different from each other ($p>0.01$); and, category D is significantly different from A, B and C ($p=0.01$). This implies that only in the multi-stream co-educational day (category D) schools the standard 8 pupils' performance increase from DIME to national KCPE was relatively small (0.83); and, significantly different from categories A, B and C schools. Another interesting observation is that, although schools in category B and D had the lowest mean performance on the DIME and national KCPE, category B schools had a relatively the same mean difference (Mean Difference = 1.73) as compared to category A (Mean Difference = 1.89) and C (Mean Difference = 1.76) schools.

Science and Agriculture

The ANOVA for Science and Agriculture on the DIME, presented in Table 18, shows that there is a significant simple main effect ($F(3, 557)=63.82$, $p=0.0001$). The mean comparison for the categories A, B, C, and D, presented in Table 30, shows that, in Science and Agriculture category A is significantly different from B, C and D ($p=0.01$); categories B and C are not significantly different from each other ($p>0.01$); and, category D is significantly different from A, B and C ($p=0.01$). Thus, boys boarding (category A) schools had the highest mean performance in Science and Agriculture on the DIME; followed by girls boarding (category B) and single stream coeducational day (category C) schools; and, last, multi-stream co-educational day (category D) schools.

The ANOVA for Science and Agriculture on the national KCPE, presented in Table 19, shows that, there is a significant simple main effect ($F(3, 557)=49.24$, $p=0.0001$). The mean comparison for the categories A, B, C, and D, presented in Table 31, shows that, in Science and Agriculture on the national KCPE all school categories are significantly different from each other ($p=0.01$). Thus, in Science and Agriculture all school categories had different levels of performance. The boys boarding (category A) had the highest mean performance; followed by single-stream co-

educational day (category C) schools, girls boarding (category B), and then, multi-stream co-educational day (category D) schools.

The ANOVA for the mean difference, presented in Table 20, shows that, there is a significant simple main effect ($F(3, 557)=8.62$, $p=0.0001$). This indicates that there is a significant difference between DIME and national KCPE performance in Science and Agriculture. On the national KCPE examination standard 8 pupils had higher scores than those obtained on the DIME. This supports the hypothesis that, there is a significant performance difference between the DIME and national KCPE scores in Science and Agriculture.

Further analysis of comparing the mean differences for categories A, B, C, and D, presented in Table 32, indicate that categories A, C, and D are not significantly different from each other ($p>0.01$); and, categories A and B are not significantly different from each other ($p>0.01$). This means that girls boarding (category B) had the smallest mean difference (0.75); although, not significantly different from that of boys boarding (category A) schools (Mean Difference = 1.60). Again, although, boys boarding schools had the highest mean performance on the DIME and national KCPE, as shown in Tables 30 and 31, the increase in performance (Mean Difference = 1.60) is not significantly different from that experienced in the co-educational day (category C and D) schools.

Aggregate Score

The ANOVA for aggregate score on the DIME, presented in Table 21, shows that, there is a significant simple main effect ($F(3, 557)=71.00$, $p=0.0001$). The mean comparison for categories A, B, C, and D, presented in Table 33, shows that, category A is significantly different from B, C and D ($p=0.01$); categories B and C are not significantly different from each other ($p>0.01$); and, category D is significantly different from A, B and C ($p=0.01$).

The ANOVA for the aggregate scores on the national KCPE, presented in Table 22, shows that, there is a significant simple main effect ($F(3, 557)=53.09$, $p=0.0001$). The comparison of the mean performance for categories A, B, C, and D, presented in Table 34, shows that category A is significantly different from B, C and D ($p=0.01$); categories B and C are not significantly different from each other ($p>0.01$); and, category D is significantly different from A, B and C ($p=0.01$).

The ANOVA for the mean difference, presented in Table 23, shows that, there is significant simple main effect ($F(3, 557)=9.12$, $p=0.0001$). This means that there is a significant difference between DIME and national KCPE aggregate score performance. On the national KCPE standard 8 pupils had higher aggregate performances than on the DIME. This supports the hypothesis that, there is a significant

performance difference between DIME and national KCPE in the aggregate scores.

The mean difference comparison for categories A, B, C, and D, presented in Table 35, shows that, categories A, C and D are not significantly different from each other ($p>0.01$); and, category B is significantly different from A, C and D ($p=0.01$). This means that, not only do the girls boarding (category B) schools have the smallest mean difference between DIME and national KCPE, but they also differ significantly from the other three categories. Boys boarding and co-educational day schools had more or less the same aggregate mean increase on the national KCPE.

Correlational analysis

Table 36 presents the pearson correlations between DIME and national KCPE in each curriculum area and aggregate performance for the school categories A, B, C, and D. The correlations are in a positive direction; and, range from $r=.42$ in Science and Agriculture for category C schools to $r=.89$ in Aggregate performance for Category A schools. The overall ($n=561$) correlations are: English language $r=.65$; Mathematics $r=.66$; Science and Agriculture $r=.60$; and, Aggregate Score $r=.87$. All correlations in Table 36 were all significant at $p=0.0001$. Since all the correlations were positive and were determined to be statistically significant, the hypothesis was supported. In other words,

there is positive relationship between DIME and national KCPE. Those pupils who score high on the DIME are more likely to score high in the national KCPE examination. Conversely, those pupils who score low in the DIME are not likely to score high in the national KCPE examination.

How high (or good) are these correlations? As Gronlund (1981) states, 'Unfortunately, simple and straightforward answers cannot be given' (p. 75). Similarly, Nitko (1983) says that 'There is no magic point on the number line above which lie good correlation coefficients and below which lie poor ones' (p. 82). There are three extremes: when

r= +1.00 - perfect positive relationship;

r= 0.00 - no relationship; and,

r= -1.00 - perfect negative relationship.

In essence, the interpretation of r depends on particular interpretive contexts and sample size. In this study, the correlations were linked to minimum and maximum, and mean performance; and, interpreted in terms of the role of DIME as a preparatory exercise for the national KCPE.

Although, the mean performance for DIME are relatively lower than those of national KCPE, the correlations indicate that those standard 8 pupils who score high on the DIME are more likely to score high on the national KCPE. Since, the mean difference are positive (KCPE <u>minus</u> DIME), those pupils who score high on the DIME are likely to have higher scores on the national KCPE. This point is also reinforced by

minimum and maximum scores. First, except for multi-stream co-educational schools in Aggregate and boys' boarding in Science and Agriculture, the minimum scores on the national KCPE are relatively higher than on the DIME. Second, the study shows that maximum scores were maintained or increased. More importantly, the positive correlations seem to indicate that score performance in the two examinations were positively related. Those standard 8 pupils who score high on the DIME are more likely to have high score performance on the national KCPE.

CHAPTER FIVE

DISCUSSION AND RECOMMENDATIONS

OVERVIEW: This chapter presents the summary of the findings; discusses the educational implications; recommendations for educational improvement; and, suggestions for further research.

SUMMARY OF THE FINDINGS

First, on the District Internal Mock Examination (DIME), standard 8 pupils had lower scores as compared to their scores national Kenya Certificate of Primary Education (KCPE) in English Language, Mathematics, Science and Agriculture, and Aggregate performance. The mean difference (KCPE minus DIME) were positive and significant ($p=0.0001$).

Second, boys boarding schools had significantly higher level of performance on the DIME and national KCPE in Mathematics, Science and Agriculture and Aggregate scores. The multi-stream co-educational day schools had lower level of performance in English Language, Science and Agriculture and Aggregate scores. The girls boarding and multi-stream co-educational day schools had the lowest level of performance in Mathematics on the DIME and national KCPE. The boarding schools had significantly higher mean

performances in English Language, although on the national KCPE single stream co-educational day schools were not significantly different from girls boarding schools.

Third, the DIME performance positively and significantly correlate with the national KCPE performance in all the three curriculum areas and aggregate performance ($p=0.0001$). The aggregate performance had the highest correlations in all school categories. Thus, those pupils who score high on the DIME are likely to score high in the national KCPE examination; and, they are more likely to obtain higher aggregate scores on the national KCPE.

DISCUSSION

The performance difference between DIME and KCPE

There are three plausible explanations for the mean difference between DIME and national KCPE scores. First, it is possible that on the DIME the class teachers strictly graded their pupils. Strict scoring may be used to show the pupils that they need to work hard to improve their performance in the national KCPE examinations. Second, it is possible that on the DIME class teachers and pupils had not covered all the material that was tested. Thus, by the time the pupils sat for national KCPE, these areas had been taught; and, hence, led to the change in the pupils average performance. Third, there is possibility that DIME may have

been more difficult than national KCPE question items; KCPE is nation-wide normed to cater for the 42 districts in Kenya.

The school variation in performance

Thias and Carnoy (1973) found that boarding secondary schools in Kenya had higher level performance than day secondary schools. It seems, too, that at primary level in Kenya, boarding primary schools have higher level of performance when compared with day primary schools. Boarding primary (single-sex) schools tend to be a carefully self-selected cluster because, first, pupils to these schools are recruited through interviews and, second, the ability to pay the boarding fees to a large extent determine pupil enrolment in these schools. Boarding schools tend to have pupils from different ethnic groups and they are more likely to chat among themselves in English language than those in co-educational day schools. Furthermore, it is plausible that pupils in boarding schools are less distracted by domestic chores in the evenings and weekends; and, therefore have more reading time and ample reading facilities than their counterparts in day primary schools.

It is interesting to note that girls' boarding primary schools (category B) do poorly in Mathematics on the DIME and national KCPE as compared to other school categories. This is in support of Eshiwani's (1985) findings at

secondary school education in Kenya. Eshiwani found that girls' secondary schools did poorly in Mathematics. Eshiwani argues that girls' schools do poorly in Mathematics because 'greater demands are made on female children to assist with household chores, care for younger siblings and fetch firewood and water' (p. 99). He adds that, society does not provide opportunities to encourage girls to do well in Mathematics. Careers related to Mathematics and Science are traditionally viewed as male careers. Furthermore, society expects girls' to do poorly in Mathematics; this leads to what Eshiwani calls Methemaphobia or 'mathematics anxiety' (p. 106).

Since gender performance differences was not the intention of this study, the educational explanations and implications on why girls' boarding schools do poorly in Mathematics are limited. Further research is needed to highlight the developmental and environmental factors that influence pupils' academic achievement in Kenya. For instance, why do girls' boarding school do poorly in Mathematics as compared to boys' boarding schools?

The positive correlations

The main purpose of this study was to determine the relationship between the DIME and national KCPE scores for standard 8 pupils. The correlational coefficients presented in Table 36 shows that these coefficients were all in a

positive direction and significant. First, this implies that there is positive relationship between the DIME scores and national KCPE scores. There is some similarity in academic achievement performance between the DIME and national KCPE examinations. The strength of this interpretation can be alluded to the fact that primary curriculum in Kenya is centrally prescribed by the Ministry of Education; and, all districts follow the same syllabi. The DIME are mainly used to assess and gauge how prepared the standard 8 pupils are for the national KCPE examinations.

Second, the time period (about three months) between the DIME and national KCPE may also account for the high correlational coefficients. This time period is most likely used for intensive revisions and examination coaching for standard 8 pupils. There is a possibility that class teachers and pupils put more effort in the 'final days' that lead to change in the level of performance in national KCPE as compared to the level of performance on the DIME. However, this interpretation does not ascertain the actual cause-effect link; and, we cannot determine the impact of the DIME on the level of performance in the national KCPE. As Gay (1981) advises, 'A significant correlation coefficient may <u>suggest</u> a cause-effect relationship but <u>does</u> not establish one' (p. 188).

Third, and in a peripheral manner, DIME scores do not seem to lack objectivity. Objectivity is here defined as the

degree to which every examiner of the pupil's performance will give exactly or nearly the same score (Cronbach, 1970). As outlined in Chapter Two, national KCPE consist of multiple-choice and essay (English language and Kiswahili) items. Multiple-choice items are computer scored; and, the essay items are scored by trained external examiners. Since, the external examiner have no idea of who the pupils are, we can assume that they are less biased. On the other hand, DIME are scored by the class teachers. Both the multiple-choice and essay items are manually scored. Several studies have shown that teacher-pupil rapport can influence the essay scoring (Daly & Dickson-Markham, 1982; Hughes, Keeling & Tuck, 1980a, 1980b). Despite the teacher-pupil rapport in DIME the correlational coefficients for English language were positive and significant in all the four school categories. The class teacher scoring, however subjective it is, can significantly correlate with external examiners (Arap-Maritim, 1987; Hopkins & Stanley, 1981). The class teacher assigned score may be one or two points away from the external examiner's score, but can be a useful predictor or indicator of the pupils future level of performance in external examinations.

EDUCATIONAL IMPLICATIONS

As outlined in Chapter Two, the Kenyan education system

has had external examinations since the colonial period (Anderson, 1970). The national KCPE plays an important role in assessing academic achievement in the 8-year primary curriculum; provides information on the level of national performance and curriculum implementation at primary level; and, more pertinently, provides a yardstick for certification, selection and allocation of primary graduates into secondary schools (and job market). It is because of the importance attached to these functions that the DIME are organized: to gauge and prepare standard 8 pupils for the national KCPE examinations. As indicated earlier, the content assessed in the DIME and national is presumed to be the same; and, thus, could account for the high correlations between the two examinations. The DIME acts as a model, a mock testing for the national KCPE. And, since they are taken about three months before national KCPE this strengthens the explanation of the high positive correlations. However, the time may be ample enough to allow for the class teachers and pupils to put more effort in the 'final days' that result in the increased performance.

As outlined in Chapter Two, external examinations, like national KCPE, have been strongly criticised for the tendency to measure current performance of pupils regardless of the psychological and socio-contextual factors; for limiting pedagogical (instructional) activities; for

encouraging competition and individualization rather than collaboration; and, for reinforcing status quo. Nevertheless, there is no education system that is problem-free, let alone the examination system. In England, Mortimore and Mortimore (1984) have observed that, external examinations have continued to hold a strong grip on the education system despite the several attempts to abolish them. Mathews (1985) sees external examinations as inevitable where educational openings for the next levels are limited. In Third World countries, as indicated in Chapter Two, external examinations are highly regarded and widely considered as objective and neutral. Educational planners are faced with difficulties of choosing between different modalities of externally examining pupils rather than abolishing the examinations. The DIME is organized as response to, and as a preparation model for, these highly regarded functions of national examinations. Hence, DIME positively and significantly correlate with national KCPE. Those pupils who score high on the DIME are more likely to obtain high scores on the national KCPE.

As described in Chapter One, national KCPE is a formal paper-pencil examination that is externally administered by the Kenya National Examination Council (KNEC) at the end (thus, summative) of primary schooling (thus, product). These are the areas in which the KCPE has often been criticised. The new 8-4-4 system has made proposals to de-

emphasize the summative aspect. Although, the 8-4-4 system was inaugurated in 1984, KCPE remains summative. A discussion with one official at Kenya National Examination Council indicated to the researcher that there are several technicalities (issues) that have not been worked out. One of the major issues pointed to the researcher was the question of how to maintain standards given the geographical and school facility variation. Two examples were given to illustrate the problems and issues that exist:

1. Hut building project: "How do you test traditional hut building? Do you assign scores to the group as a whole or the individual pupil? What about the material: in urban areas you do not have grass. And so on..."
2. Maize planting as a project: "It takes about four months in some parts of Machakos while it takes eight months in Molo. Weather and other interferences would make it difficult to assess. Leave alone that, urban schools have no land..." (personal interview, June 21, 1988).

These issues are not easy to overcome. Effective and meaningful educational change, including examination and assessment innovation, demand that several factors must be carefully weighed (Fullan, 1982). In educational examinations and assessment, Rowntree (1987) suggests, educational planners should consider the weight of four factors, namely, educational relevance, respectability,

inertia, and cost, when selecting suitable and appropriate modality. Rowntree advises that:

> any assessment innovation that will cost more, challenge local traditions, or differ from our institution's 'significant others' have been believed to expect, can be justified by firmly establishing its greater educational relevance (p. 167).

It is with this in mind that it is recommended that a study be conducted to determine how the DIME should be incorporated in the national KCPE. The DIME exist (there is the impetus) in nearly all districts (costs are already being incurred) in Kenya. Furthermore, since the DIME are district-based, this would be in line with the present District Focus for Rural Development.

RECOMMENDATIONS

Limitations of these recommendations

First, since this study's location were not randomly selected, by all means we cannot assume that findings are generalizable to other district areas in Kenya with different physical and socio-economic environment. Second, the study is limited to relationship between the DIME and national KCPE for standard 8 pupils. We cannot generalize on the factors that contribute to the level of performance in the national KCPE and the level of influence of DIME on that performance. Third, the following recommendations should be treated as possible suggestions on how the DIME could be used for other educational purposes.

Recommendation one

The DIME scores should be incorporated into the national KCPE achievement scores as a continuous assessment of the standard 8 pupils.

Learning is a continuous process, continuous assessment and testing should be part of this learning and instructional process in the Kenyan primary schools. The DIME can provide formative assessment for the Standard 8 pupils; thus, help to make "continuous (formative) assessment an integral part of evaluating students abilities and achievements" as emphasized in the 8-4-4 system

(Ministry of Education, Nov. 7, 1984). Furthermore, by acknowledging and integrating the DIME, this may provide a strong leeway for teaching and testing local (District) environments (Geography, History, etc.) that are not possible to assess in the national KCPE. The DIME can include specific items to test the District specific environment.

Recommendation two

The DIME examination should contribute about one third (1/3) of the national KCPE achievement scores in all the curriculum areas examined.

As indicated one of the objectives of the new 8-4-4 system is to reduce the current over-dependence on summative externally administered KCPE and assist in localization of the primary school curriculum (educational relevance criteria). The district centres should be given the mandate to test the pupils in their district and the scores assigned to contribute a reasonable proportion in the final KCPE achievement scores. It is hereby suggested that one-third of the national KCPE should come from the DIME.

This recommendation may be challenged on the grounds of national standards, nepotism and tribalism, and thus, challenge national unity. On the contrary, first, this would be in line with the present District Focus for Rural Development strategy. The DIME are organized at the district

level and they would provide an opportunity for district educational officers to strengthen assessment in their schools. Second, this would provide a leeway for testing the local (district specific) environment. When school children and teachers know that knowledge on their local environment would be tested, we can be certain that knowledge (or course work) would be taught in schools. As indicated, examinations have strongly influence on the classroom instructional activities (Oxenham, 1982). Thus, this would go along way in making examinations educationally relevant, a justification that is of great importance (Rowntree, 1987). And, third, this would provide teachers an administrative and motivating device (Turner, 1984). Teacher-pupils relationship is likely to be strengthened when pupils know that their teachers' assessment would contribute a fairly reasonable weight to the national KCPE scores.

Recommendation three

Each District should publish a DIME Newsletter.

It is hereby recommended that there should be a regular analysis of the standard 8 pupils' performance in each examination paper and in each item of the DIME. The District Education Officials particularly the District Inspectorate personnel and the District Examination Officers (as they are the staff closest to the teachers) should be encouraged to prepare, publish and distribute a DIME Newsletter. This can

be similar to the National KCPE Newsletter that is published "to assist change, bring about [needed] continued improvement in teaching methodology and a more improvement in candidates' performances in all subjects examined in the primary curriculum" (KNEC, 1987, Introduction). While the National KCPE Newsletter help teachers to review the pupils' performance in the previous year, the DIME Newsletter could and would assist teachers to assess their teaching strategies, do the necessary adjustments, and advise the Standard 8 pupils as they prepare for the national KCPE. The whole process of preparing and producing the newsletter would also provide an opportunity for many classroom teachers at the District level to be involved and have first hand experience in item analysis and be able to appreciate statistics that are reported in the National KCPE Newsletters.

Recommendation four

There should be District-wide in-service training on measurement, evaluation and curriculum development.

There is no concrete data on the level of skills and experience primary school teachers in Kenya have on measurement and evaluation. There are reasons to assume that these are lacking or not well coordinated. There are indications that class teachers generally lack these skills (Stiggins & Bridgeford, 1982). More often than not, on the

pre-service training measurement and evaluation is scantly taught as one of the topics in professional studies. There is no doubt that class teachers need skills on measurement and evaluation; and, greatly need them when what they teach ends up in an external examination. Mathews (1985) argues

> While it is to be hoped that teachers do not entirely base their teaching on the expectations of [external] examiners, it would be wrong to pretend that this is not a dominating factor in those courses which terminate in a public [external] examination (p. 90).

It is necessary for each district to arrange in-service training on measurement and evaluation; and, encourage teachers to collaboratively share these skills. Again, the present District Internal Mock Examination system provides a useful forum for teachers to practice their skill in form of examination subject panels when setting and analyzing the pupils results; and, when publishing the proposed DIME Newsletter. The DIME would not only be used for gauging and preparing standard 8 pupils for national KCPE, but would help:

i) teachers and district education officers to be more enlightened on how examinations are developed and organized;

ii) teachers to conduct useful, feasible, proper and technically-sound examination tests for instructional purpose;

iii) teachers and education officers to develop a clear perspective about the role of examination in education; and,

iv) facilitate curriculum development in Kenya.

FURTHER RESEARCH

1. As indicated, correlational studies do not ascertain the cause-effect relationship. There is need for further research to ascertain the impact of DIME on the level of performance in national KCPE.

2. As indicated, the DIME are widely conducted in many districts in Kenya. This study has demonstrated that the DIME is closely related to national KCPE. There is need for further research to find out the present procedures and problems of organizing the DIME, and perception of classroom teachers perception about DIME.

3. As indicated, further research is needed to highlight the developmental and environmental factors that interactively influence pupils' school achievement in Kenya.

TABLES

Table 1.

Sample Schools Studied

Category	No. of Schools	Total Teaching Staff	Standard 8 Enrollment	Total School Pupil Enrollment
A Boys only	2	19	78	670
B Girls only	2	16	68	597
C Co-ed I	4	79	134	2,131
D Co-ed II	4	151	371	5,625
Total	12	265	651	9,023

Table 2.

The Distribution of Standard 8 Pupils For Each Category

	Category	Kericho		Kisii		Total	
A	Boys only	33	(5.88%)	42	(7.49%)	75	(13.37%)
B	Girls only	35	(6.24%)	32	(5.70%)	67	(11.94%)
C	Co-ed I	70	(12.48%)	56	(9.98%)	126	(22.46%)
D	Co-ed II	142	(25.31%)	151	(26.92%)	293	(52.23%)
	Total	280	(49.91%)	281	(50.09%)	561	(100.00%)

Table 3.

The Distribution of Standard 8 Pupils By Gender

Gender	Kericho	Kisii	Total
Boys	164 (29.23%)	155 (27.63%)	319 (56.86%)
Girls	116 (20.68%)	126 (22.46%)	242 (43.14%)
Total	280 (49.91%)	281 (50.09%)	561 (100.00%)

Table 4

The Frequency Distribution in Percentage of Performance in English Language, Mathematics, Science and Agriculture (1986)

Curriculum Area	Exam	Scores 1 - 6	Scores 7-12
English Language	DIME	71.48	28.52
	KCPE	28.70	71.29
Mathematics	DIME	75.04	24.96
	KCPE	54.18	45.81
Science and Agriculture	DIME	74.68	25.32
	KCPE	49.37	50.63

(n = 561)

Table 5

The Frequency Distribution in Percentage of Performance in English Language by School Category (1986)

Gender	Exam	Scores 1 - 6	Scores 7 - 12
A. Boys Only	DIME	38.67	61.33
	KCPE	9.35	90.65
B. Girls Only	DIME	50.67	49.25
	KCPE	11.98	88.11
C. Co-ed I	DIME	65.89	34.15
	KCPE	22.22	77.78
D. Co-ed II	DIME	85.87	12.96
	KCPE	40.28	59.72
Total	DIME	71.48	28.52
	KCPE	29.32	71.29

(n=561)

Table 6

The Frequency Distribution in Percentage of Performance in Mathematics for the Four School Categories (1986).

Gender	Exam	Scores 1 - 6	Scores 7 - 12
A. Boys Only	DIME	43.98	56.02
	KCPE	18.70	81.23
B. Girls Only	DIME	86.60	13.48
	KCPE	68.68	31.41
C. Co-ed I	DIME	65.09	34.86
	KCPE	33.30	66.65
D. Co-ed II	DIME	84.63	15.34
	KCPE	68.93	31.06
Total	DIME	75.04	24.96
	KCPE	54.18	45.81

Table 7

The Frequency Distribution in Percentage of Performance in Science and Agriculture for the Four School Categories (1986)

Gender	Exam	Scores 1 - 6	Scores 7 - 12
A. Boys Only	DIME	32.01	67.99
	KCPE	10.70	89.38
B. Girls Only	DIME	65.66	34.34
	KCPE	49.33	50.75
C. Co-ed I	DIME	70.84	29.39
	KCPE	33.35	66.70
D. Co-ed II	DIME	89.39	10.57
	KCPE	66.19	33.77
Total	DIME	74.69	25.32
	KCPE	49.37	50.63

Table 8

The Frequency Distribution in Percentage of Aggregate Score Performance by School Category (1986)

School Category	N	Exam	Aggregate Scores 6 - 24	25 - 36	37 - 48	49 - 60	61 -72
A. Boys Only	75	DIME	1.33	13.33	33.33	41.33[a]	10.67
		KCPE	2.66	4.00	17.33	30.67	45.33[b]
B. Girls Only	67	DIME	2.99	38.81	43.28[a]	14.93	0
		KCPE	0	13.43	62.69[b]	20.90	2.99
C. Co-ed I	125	DIME	4.76	47.24[a]	38.10	7.94	3.97
		KCPE	2.38	10.32	37.30	39.68[b]	10.32
D. Co-ed II	293	DIME	17.45	54.27[a]	24.91	3.07	0
		KCPE	8.19	32.76	39.93[b]	14.33	4.78
Total	561	DIME	10.87	44.92[a]	31.19	10.70	2.32
		KCPE	5.17[a]	21.57	39.04[b]	22.99	11.23

a- Modal class for DIME
b- Modal class for national KCPE

Table 9

Minimum and Maximum Score Performance by School Category

School category	Exam	English Language		Math.		Science & Agriculture		Aggregate Score	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
A. Boys only	DIME	1	12	1	12	3	12	15	67
	KCPE	3	12	2	12	1	12	15	72
B. Girls only	DIME	2	12	1	11	1	10	17	58
	KCPE	5	12	2	12	4	11	26	63
C. Co-ed I	DIME	1	12	1	12	1	12	18	66
	KCPE	4	12	2	12	2	12	18	70
D. Co-ed II	DIME	1	12	1	12	1	12	9	56
	KCPE	1	12	1	12	1	12	7	68
Overall	DIME	1	12	1	12	1	12	9	67
	KCPE	1	12	1	12	1	12	7	72

Table 10

Means and Standard Deviations of Performance in English Language, Mathematics, Science and Agriculture, and Aggregate By School Category (1986)

School Category	Exam	English Language		Math		Science & Agric.		Aggreg. score	
		M	SD	M	SD	M	SD	M	SD
A Boys'	DIME	8.29	3.36	7.00	2.46	7.69	1.87	48.12	10.49
n = 75	KCPE	9.55	2.05	8.89	2.41	9.29	2.36	56.12	11.93
B Girls'	DIME	7.57	2.90	4.42	2.19	6.13	1.63	39.19	8.93
n = 67	KCPE	8.76	1.74	6.15	2.16	6.88	1.44	44.12	7.29
C Co-ed I	DIME	6.13	1.87	6.11	2.64	5.49	3.23	38.44	9.13
n = 127	KCPE	8.55	2.20	7.87	2.80	7.83	2.36	44.04	10.45
D Co-edII	DIME	4.70	1.95	4.92	2.12	3.74	2.28	32.07	8.17
n = 293	KCPE	7.48	2.33	5.75	2.45	5.96	2.45	39.36	11.71
Overall	DIME	5.84	2.67	5.41	2.44	4.95	2.80	36.50	10.43
n = 561	KCPE	8.15	2.32	6.70	2.70	6.94	2.60	44.12	12.47

M = Mean SD = Standard Deviations

Table 11

Mean Differences of Performances in English Language, Mathematics, Science and Agriculture, and Aggregate Score by School Category (1986)

School Category	English Language	Mathematics	Science & Agriculture	Aggregate Performance
A Boys only n = 75	1.25	1.89	1.60	7.99
B Girls only n = 67	1.19	1.73	0.75	4.93
C Co-ed I n = 127	2.41	1.76	2.33	9.60
D Co-ed II n = 293	2.78	0.83	2.22	7.29
Overall n = 561	2.31	1.29	1.99	7.62

Table 12

ANOVA for English Language on the DIME

Source of Variation	df	SS	MS	F	p
School Category	3	1045.53	348.51	66.06	.0001
Unexplained	557	2938.67	5.28		
Total	560	3984.20			

Table 13

ANOVA for English Language on the National KCPE

Source of Variation	df	SS	MS	F	p
School category	3	322.30	107.43	22.17	.0001
Unexplained	557	2699.13	4.85		
Total	560	3021.42			

Table 14

ANOVA for Mean Difference in English Language

Source of Variation	df	SS	MS	F	p
School category	3	234.61	78.20	19.25	.0001
Unexplained	557	2262.66	4.06		
Total	560	2497.27			

Table 15

ANOVA for Mathematics on the DIME

Source of Variation	df	SS	MS	F	p
School category	3	386.43	128.81	24.38	.0001
Unexplained	557	2943.09	5.28		
Total	560	3329.52			

Table 16

ANOVA for Mathematics on the National KCPE

Source of variation	df	SS	MS	F	p
School category	3	816.56	272.19	46.34	.0001
Unexplained	557	3271.93	5.87		
Total	560	4088.48			

Table 17

ANOVA for Mean Difference in Mathematics

Source of Variation	df	SS	MS	F	p
School category	3	130.58	43.53	9.99	.0001
Unexplained	557	2426.64	4.36		
Total	560	2557.22			

Table 18

ANOVA for Science and Agriculture on the DIME

Source of Variation	df	SS	MS	F	p
School category	3	1121.57	373.86	63.82	.0001
Unexplained	557	3263.03	5.86		
Total	560	4384.60			

Table 19

ANOVA for Science and Agriculture on the National KCPE

Source of Variation	df	SS	MS	F	p
School category	3	794.35	264.78	49.24	.0001
Unexplained	557	2995.34	5.38		
Total	560	3789.69			

Table 20

ANOVA for Mean difference in Science and Agriculture

Source of Variation	df	SS	MS	F	p
School category	3	145.18	48.39	8.62	.0001
Unexplained	557	3128.71	5.62		
Total	560	3273.89			

Table 21

ANOVA for Aggregate score on the DIME

Source of Variation	df	SS	MS	F	p
School category	3	16854.42	5618.21	71.00	.0001
Unexplained	557	44073.63	79.13		
Total	560	60928.25			

Table 22

ANOVA for Aggregate Score on the National KCPE

Source of variation	df	SS	MS	F	p
School category	3	19379.10	6459.70	53.09	.0001
Unexplained	557	67769.14	121.67		
Total	560	87148.24			

Table 23

ANOVA for Mean Difference in Aggregate Scores

Source of Variation	df	SS	MS	F	p
School category	3	1024.68	341.56	9.12	.0001
Unexplained	557	20865.69	37.46		
Total	560	21890.37			

Table 24

Duncan's Multiple Range Test for Mean Performance in English Language On the DIME.

School Category	n	M ranked		Significance*
A. Boys only	75	8.29		
			>	Not Different
B. Girls only	67	7.57		
C. Co-ed. I	126	6.13		Different
D. Co-ed. II	293	4.70		Different

(df=557 MSE=5.25 *p=.01)

Table 25

Duncan's Multiple Range Test for Mean Performance in English Language on the National KCPE

School Category	n	M	ranked		Significance*
A. Boys only	75	9.55			
				>	Not Different
B. Girls only	67	8.76			
				>	Not Different
C. Co-ed. I	126	8.55			
D. Co-ed. II	293	7.48			Different

(df=557 MSE=4.85 *p=0.01)

Table 26

Duncan's Multiple Range Test for Mean Difference in English Language.

School category	n	D ranked		Significance*
D. Co-ed II	293	2.79		
			>	Not Different
C. Co-ed I	126	2.41		
A. Boys only	75	1.25		
			>	Not Different
B. Girls only	67	1.19		

(df=557 MSE=4.06 *p=0.01)

Table 27

Duncan's Multiple Range Test for Mean Performance in Mathematics on the DIME

School category	n	M ranked		Significance*
A. Boys only	75	7.00		Different
C. Co-ed. I	126	6.11		Different
D. Co-ed. II	293	4.92	>	Not Different
B. Girls only	67	4.42		

(df=557 MSE=5.28 *p=0.01)

Table 28

Duncan's Multiple Range Test for Mean Performance in On the National KCPE.

School category	n	M ranked		Significance*
A. Boys only	75	8.89		Different
C. Co-ed. I	126	7.87		Different
B. Girls only	67	6.15	>	Not Different
D. Co-ed. II	293	5.75		

(df=557 MSE=5.87 *p=0.01)

Table 29

Duncan's Multiple Range Test for Mean Difference in Mathematics.

School category	n	D ranked		Significance*
A. Boys only	75	1.89		
C. Co-ed. I	126	1.76	>	Not Different
B. Girls only	67	1.73		
D. Co-ed. II	293	0.83		Different

(df=557 MSE=4.36 *p=0.01)

Table 30

Duncan's Multiple Range Test for Mean Performance in Science and Agriculture on the DIME

School category	n	M ranked		Significance*
A. Boys only	75	7.69		Different
B. Girls only	67	6.13	>	Not Different
C. co-ed. I	126	5.49		
D. Co-ed. II	293	3.74		Different

(df=557 MSE=5.86 *p=0.01)

Table 31

Duncan's Multiple Range Test for Mean Performance for Science and Agriculture on the National KCPE

School category	n	M ranked	Significance*
A. Boys only	75	9.29	Different
C. Co-ed. I	126	7.83	Different
B. Girls only	67	6.88	Different
D. Co-ed. II	293	5.96	Different

(df=557 MSE 5.38 *p=0.01)

Table 32

Duncan's Multiple Range Test for Mean Difference for Science and Agriculture

School category	n	M ranked		Significance*
C. Co-ed. I	126	2.33		
D. Co-ed. II	293	2.22	>	Not Different
A. Boys only	75	1.60		
B. Girls only	67	0.75	>	Not different

(df=557 MSE=5.62 *p=0.01)

Table 33

Duncan's Multiple Range Test for Mean Performance for Aggregate Score on the DIME

School category	n	M ranked		Significance*
A. Boys only	75	48.13		Different
B. Girls only	67	39.19		
C. Co-ed. I	126	38.44	>	Not Different
D. Co-ed. II	293	32.07		Different

(df=557 MSE=79.13 *p=0.01)

Table 34

Duncan's Multiple Range Test for Mean Performance for Aggregate Score on the National KCPE

School category	n	M ranked		Significance*
A. Boys only	75	56.12		Different
C. Co-ed. I	126	48.04		
B. Girls only	67	44.12	>	Not Different
D. Co-ed. II	293	39.36		Different

(df=557 MSE=121.67 *p=0.01)

Table 35

Duncan's Multiple Range Test for Mean Difference for Aggregate Score

School category	n	D ranked		Significance*
C. Co-ed. I	126	9.60		
A. Boys only	75	7.99	>	Not Different
D. Co-ed. II	293	7.29		
B. Girls only	67	6.93		Different

(df=557 MSE=37.46 *p=0.01)

Table 36

Pearsons Correlational Coefficients* between DIME and National KCPE (1986)

School category	English Language	Mathematics	Science & Agric.	Aggregate score
A. Boys n=75	.58	.73	.67	.89
B. Girls only n=67	.54	.78	.46	.78
C. Co-ed I n=126	.63	.70	.42	.82
D. Co-ed II n=293	.61	.50	.53	.86
Overall n=561	.65	.66	.60	.87

(*p=0.0001)

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APPENDIX A

School data sheet

1. School _____ District _____

2. Pupil enrolment: total (1986) _____ STD 8 _____

3. Category of school:

   __ Boys' boarding

   __ Girls' boarding

   __ Single stream co-educational day

   __ Multi-stream co-educational day

   (Number of streams ____)

4. Exam performance in 1986:

   DIME _____

   __KCPE _____

5. Number of staff members (1987): _____