

Some Factors Contributing to the Attrition of Secondary
School Teachers in Zambia, 1984-1988.

BY

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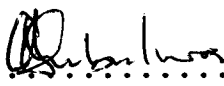
DEDICATION

Dedicated to my Sister, Regina Monde Subulwa,
for her tender love, sacrifice and all that
she has gone through because of me.

2010

DECLARATION

I, Charles Mwakamui Subulwa, do hereby declare that this dissertation represents my own work and that it has not previously been submitted for a degree at the University of Zambia or at another university.

Signed:..........

Date:.....

APPROVAL

This dissertation of Charles Mwakamui Subulwa is approved as fulfilling part of the requirements for the award of the Master of Education degree by the University of Zambia.

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ABSTRACT

The present study attempted to find out the extent to which qualified teachers never actually begin teaching (graduation loss) and the extent to which serving teachers leave the profession (active loss) in relation to sex, subject of specialization and level of qualification in the period 1984 to 1988.

The investigation endeavoured to establish whether or not a relationship existed between graduation loss and sex; graduation loss and level of teacher qualification; graduation loss and teacher's subject of specialization; active loss and sex; active loss and level of teacher qualification; and finally between active loss and teacher's subject of specialization.

A population of 2,464 teachers who had graduated from secondary school teacher training institutions in Zambia, including the University of Zambia, in the period 1984 to 1988 was identified. The population was then categorized into sub-populations according to sex, level of qualification and subject of specialization. The classification resulted in ten sub-populations. After classification, stratified random sampling was used to draw 144 subjects from the ten sub-populations.

Check-lists were used to collect nominal data on these subjects. The chi-square was used to test the hypotheses at the .05 or better levels of significance.

The study found that a teacher's sex has no significant influence on either graduation or active loss and that the area of subject specialization does not significantly influence graduation loss. However, the study also revealed that the type of qualification a teacher holds significantly influences both graduation and active loss and that the area of subject specialization is significantly related to active loss.

The study concludes with recommendations on how to deal with the problem of teacher loss in schools, one of which is that the Bachelor of Arts degree with Education be made more specific to teaching needs.

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CHAPTER ONE

INTRODUCTION

1.1 Background

Retention of trained secondary school teachers in all subjects is a world-wide problem which is common to highly developed countries such as the United States of America, the United Kingdom, France and medium-developed countries like Italy, Spain, Portugal and Greece (Orivel and Perrot, 1987, p.1) as well as developing countries such as Zambia (UNDP 1986, p.29).

The magnitude of teacher shortage varies from country to country and does not affect all subjects to the same degree in these countries. Coombs (1985), Orivel and Perrot (1987) and Wagner (1987) report that in the Organisation for Economic Co-operation and Development (OECD) countries, such as the USA, the UK and France, there is evidence of secondary school teacher shortages in Biology, Mathematics, Physical Science and technical subjects. UNDP (1986) also reports that Zambia had secondary school teacher shortages in English, Mathematics and Science for 1985.

It has been argued by Murnane (1987) that science and mathematics teachers are difficult to recruit and retain in highly industrialized countries because of high salary options that are open to such teachers in business and industry. In developing countries with economies that are agriculturally based and

consequently offering few opportunities for science and mathematics teachers in industry, their shortage is due to there being relatively few education students who study these subjects at the post-secondary level.

However, although Zambia is a developing country, its economy is not wholly agriculturally based and it has had for a long time a deliberate policy of encouraging post-secondary school students to study science. Shortage of such teachers must therefore be attributed to reasons other than or additional to those Murnane (1987) gives.

Scholars such as Mason (1966) and Pavalko (1970) have associated secondary school teacher shortage in the United States of America with sex. They argue that because teaching is a predominantly female occupation in the USA, shortages occur because in contrast to men, women teachers do not continuously work in the occupation for which they have been trained due to such contingencies as marriage, home-making, child-bearing and the rearing of children.

The National Education Association of the USA (1960) estimated that only 72.5 percent of newly qualified graduates of 1959 (both men and women) actually entered teaching; of the new supply of 1960 teachers (mainly women) only 82 percent were expected to be teaching in the following new school calendar year.

Similarly, in Zambia, Shaw (1979) has shown that between 1970 and 1971, teacher losses among females were higher than among males from all institutions except the University of Zambia where the pattern was the same for both sexes. Commenting on the sex issue and loss from teaching, Pavalko (1970, p.340) states that

In a situation where women have acquired rather extensive, costly and specialized education to prepare them for work in a particular occupation ... non-participation in the labour force represents a distinctive type of talent and resource loss as well as a reduction of optimal utilization of educational and occupational training resources when the training acquired is not utilized.

Currently, Zambia produces qualified secondary school teachers from six institutions, namely, Copperbelt Secondary Teachers' College which trains Science, Mathematics and Home Economics Diploma Teachers; Nkrumah Teachers' College which trains Diploma Teachers for Mathematics, General Science, English, History, Geography, Civics, Religious Education and Physical Education; Luanshya Technical and Vocational Teachers' College which trains Industrial Arts and Commercial Subject Teachers; Evelyn Hone and Natural Resources Development Colleges which have sections that train Art, Music and Agricultural Science Diploma Teachers respectively; finally, the School of Education at the University of Zambia which trains graduate teachers for both science and social science subjects. The operation of the quota system at the University,

which responds to the government's manpower priority requirements for scientists and teachers, ensures that a large proportion of undergraduates read for plain Bachelor of Science, Bachelor of Arts with Education and Bachelor of Science with Education degrees (Sanyal et al. 1976; University Calendar 1986-1987).

These institutions annually produce about 600 secondary school teachers in various subjects (Kelly, 1991, p.135) but science, mathematics and English departments in schools are not adequately staffed despite the high rate of teacher production. While the rapid expansion of the school system since 1964 may partly account for the shortfall of teachers in schools, the major reason according to several studies is the high wastage rate of teachers from teaching. Sanyal et al. (1976) found an average wastage rate of 21 percent, Jackman (1977) put the rate at 18 percent for the period 1970-1974, while Shaw (1979) showed that out of 585 teachers that were supplied by the University of Zambia between 1969 and 1977, only 26.3 percent still remained in teaching by the first term of 1978.

More recently, Kelly (1991) has calculated that the cumulative output of trained secondary school teachers from all institutions starting from 1969 up to the end of 1985 was Bachelor of Arts with Education - 1,448; Bachelor of Science with Education - 456; and all Diplomates - 4,996, giving a total of 6,900 Zambian teachers. In 1985, there were 234 established schools with 1,019 senior and

1,958 junior classes. Assuming a staffing ratio of 1.5 teachers per class plus an additional two staff per school as administrators, theoretical staffing needs for 1985 would have been 4,929. This figure could have been met if all who had been trained as teachers since 1969 had remained in teaching. However, due to the high wastage rate, 1985 had shortfalls of almost 600 Zambian teachers of English, Mathematics and Science (UNDP, 1986; table number 6.4) when there should have been excess teachers in the secondary school system.

Another feature of secondary school teacher supply in Zambia is that there is a shortage of graduate teachers for senior classes while junior classes are reported to be adequately staffed. The National Technical Assessment and Programming Mission to Zambia (NATCAP) report (UNDP, 1986) shows that the number of diploma-holding teachers in these schools is sufficient to meet the needs of junior classes; recruitment of expatriates for these grades has been stopped. But there still exists a shortage of Zambian graduate teachers at senior levels. Moreover, Kelly (1991) estimated that the wastage rate of Zambian secondary school teachers, graduates and diploma-holders combined, shrank from 10.6 percent in 1976-1979 to 5.5. per cent in 1980-1983, but quickly draws attention to the fact that, although there appears to be overstaffing in overall numbers in secondary schools, the senior classes and certain subjects have a shortage of teachers. It can be inferred from what the NATCAP report and Kelly say that if the

output of graduate teachers from the University of Zambia has been adequate, then their shortage in schools is due to their high wastage rate compared to diplomate teachers. The present study investigates this phenomenon of teacher wastage in so far as it relates to sex, level of teacher qualification and teacher's subject of specialization. In addition, the study pays attention in its discussion to other variables that, on the basis of findings from earlier studies, have an influence on teacher wastage.

1.2 Statement of the problem

The high teacher wastage rate in Zambia reported by Jackman (1977), Shaw (1979) and Kelly (1991) represents a low retention rate of personnel and a wastage of training resources and trained manpower which does not augur well for the country's development priorities.

Other studies have investigated possible causes for this high rate of wastage. However, while this study will discuss other factors related to the various degrees of teacher losses using material from earlier studies, its primary intention is to find out:

- a. Whether wastage rates are higher among women than men;
- b. Whether the wastage rate of industrial arts and language and social science teachers is higher than that of science teachers; and finally
- c. Whether the wastage rate of diploma holders is higher than that of degree holders.

1.3 Purpose of the study/objectives

The purpose of this study is to investigate the extent to which qualified teachers never actually begin teaching (graduation loss) and the extent to which serving teachers leave the profession (active loss) in relation to sex, subject specialization and level of qualification. The study will investigate these variables over the period 1984 to 1988 because it is desirable to have the most up-to-date information on this problem. Since data for 1989 and 1990 were not readily available at the Ministry of Education (formerly General Education Youth and Sport) Headquarters in Lusaka, the study could not deal with losses after 1988.

1.4 Hypotheses

In the light of findings from other countries and of the work of previous investigators in Zambia, this thesis tests the following hypotheses:

1. There is no relationship between graduation loss and sex.
2. There is no relationship between graduation loss and teacher subject specialization.
3. There is no relationship between graduation loss and level of teacher qualification.
4. There is no relationship between active loss and sex.
5. There is no relationship between active loss and teacher subject specialization.
6. There is no relationship between active loss and level of teacher qualification.



1.5 Variables

The study has identified the following independent and dependent variables:

<u>INDEPENDENT</u>	<u>DEPENDENT</u>
1. Teacher Qualification Degree/Diploma	1a. Graduation loss b. Active loss
2. Subject specialization	
a. Non-sciences English, French, Zambian Languages, Geography, History, Civics, Commerce, Accounts, Typing, Office Practice, Religious Studies, Physical Education, Music, Art, Woodwork, Metal Work and Technical Drawing.	2a. Graduation loss b. Active loss
b. Sciences: Mathematics, Biology, Agricultural Science, Chemistry, Physics and General Science.	
3. Sex: Male/female	3a. Graduation loss b. Active loss

1.6 Significance of the study

The importance of this study lies in the fact that it reveals the extent to which the selected variables - sex, level of qualification and teacher's area of expertise - relate to an individual's decision either not to join teaching after successfully completing training or having joined teaching to remain in it. Such information might help education policy formulators in taking steps to reduce loss in the most affected group or groups.

Secondly, by indicating the relationship between the selected variables and loss from teaching, information from this study is of value to educational administrators in making recruitment decisions and recommendations to the teaching service and in finding ways and means of inducing reluctant categories of prospective Zambian teachers to join and remain in teaching.

The study's findings show categories of teachers that suffer most from graduation and active loss. Such information is helpful to educational policy makers and administrators, because teacher loss not only affects the actual numbers and types of teachers who are lost to classroom teaching but has also a direct bearing on the quality of programmes offered in schools as well as on the cognitive accomplishments of the outputs from secondary schools.

Theoretically, several studies undertaken so far in Zambia by Moores (1968) Stannard (1970), Sanyal et al. (1976), Jackman (1977), Shaw (1979) and Chakulimba (1986) have reported a general teacher shortage. Not much is known about the specific types of teachers that the school system lacks. It is important to attract and retain all categories of teachers in various disciplines of the secondary school system. By identifying specific categories of teachers that are the most vulnerable to loss, this study sheds new light on the problem of secondary school teacher shortage that the country faces. The study also contributes data for further investigation of other influences involved in teacher loss.

1.7 Limitations of the study

Limited time and available financial resources did not make it possible to conduct a detailed investigation of all variables that may be related to teacher loss, such as conditions of service or the relationship between the employee and employer. It was also not possible for the study to examine the correlation/relationship between the class of a degree or diploma held by a teacher, that is, distinction, merit, credit or ordinary pass and either loss from teaching or persistence in teaching. Neither was it possible for the study to investigate possible differential effects according to type of school (boarding, day, boys, girls, etc) or according to geographical location (urban, rural). Some of these possible influences on loss from teaching will, however, be discussed (in chapter five) using findings/material from earlier

studies. The main focus of this study was, therefore, to find out if there was any relationship between the selected variables - sex, type of qualification and subject of specialization - and teacher loss in secondary schools. Interpretations of the results are thus confined to no more than the selected variables. It is acknowledged that teacher loss/wastage rates could be affected by conditions of service, type of school ownership, geographical location or the class of a given credential. Another limitation is that the study had to depend on incomplete data because postings, annual and termly staff return records and graduation records could not be easily traced either at the Ministry of Education headquarters or at secondary teacher training colleges.

1.8 Operational Definitions

In this study words and phrases are used with the meanings shown below:

1. Teacher attrition - refers to loss of trained teachers from actual teaching in secondary schools.
2. Active teaching loss - refers to those teachers who leave teaching after they have entered the teaching profession from a training institution (Shaw, 1979).
3. Graduation loss - refers to the loss of teachers who have been trained but do not enter the teaching profession (Shaw, 1979).
4. Graduate - refers to teachers holding an education degree from the University of Zambia.

5. Diplomate - refers to teachers holding a secondary school teaching diploma from any college in Zambia.
6. Type or level of teacher qualification refers to possession of either a degree or diploma certificate by a teacher.
7. Non-science teacher - refers to secondary school teachers qualified to teach Industrial Arts, Language and Social Science subjects.
8. Science teacher - refers to qualified secondary school teachers in Mathematics, Biology, Chemistry, Physics, Agricultural Science and General Science.
9. Industrial Arts teacher - refers to teachers qualified to teach technical subject(s) such as Woodwork, Metalwork and Technical Drawing.
10. Language and Social Science teacher - refers to teachers qualified to teach languages such as English, French and Zambian Languages as well as those qualified to teach Social Sciences such as Geography, History, Civics, Home Economics, Art, Music, Religious Studies, Physical Education, Commerce, Accounts, Office Practice and Typing.
11. Teacher subject specialization - refers to the category to which a qualified teacher's teaching subjects belong such as science or non-science.

1.9 Organisation of the study

The study is organized into five chapters, the first of which includes the introduction, statement of the problem, objectives, hypotheses, variables, significance, limitations and operational definitions. Chapter two reviews related literature while chapter three covers methodology. In chapter four, results are presented and the last chapter discusses findings, gives a summary and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

As has been mentioned in chapter one, a number of studies have looked at the problem of teacher wastage in Zambia. Some of these have quantified teacher wastage and have shown that the rate is quite high; for example Sanyal et al. (1976) put it at 21 percent and the NATCAP Report (UNDP, 1986) showed that in 1985, Zambia had a short fall of almost 600 indigenous teachers of English, Mathematics and Science.

Moore (1968) investigated factors related to teacher dropout in the Copperbelt in the period 1964 to 1967. Using two procedures he picked 65 former teachers who were working in private companies in Kitwe alone for his sample. First, he drew a preliminary list of names of potential interviewees through people he thought were well acquainted with the economic, political and social situation in Kitwe and in addition had contacts with teachers or school officials. Second, each interviewee was asked if he/she knew any former teachers who resided in the Kitwe area at that time. It was through the latter method that most members of the sample were identified.

Of the 65 interviewees, 9 had trained outside Zambia and 56 had trained in Zambian colleges; of the 56, 25 came from Chalimbana alone while the remaining 31 were from Kitwe, Charles Lwanga,

Livingstone, Solwezi, and Chikuni Training Colleges and from Kafue Secondary School. The study's findings were that teachers left teaching mainly due to low pay and the declining status of the profession.

However, it is important to first of all note that at the time of the study, 1964 to 1967, the Zambian teacher training colleges mentioned in the preceding paragraph specialized in training primary school teachers. Second, secondary teacher training institutions in the country at that time had just started and had not had sufficient time to produce even their first cohort of trained teachers. For example, the University of Zambia school of education produced its first 11 graduate teachers in 1969 (Kelly, 1991). Consequently, the secondary school teaching force in the period of Moores' study comprised mostly expatriates and a negligible proportion of Zambians. In light of what has been pointed out, it can safely be said that more than half the sample in Moores' study comprised mostly former primary school teachers in Kitwe only. Such a sample was not representative of all types of teachers in Kitwe, let alone the whole country, although its findings were generalized to secondary school teachers in the whole country. In addition, the sampling procedure that was based upon available enclaves of former teachers in Kitwe's Copper Mines, Zambia Railways and City Council Offices constitutes a serious methodological weakness that lacked scientific rigour. Finally, the study was concerned with factors that were associated with teachers

leaving the profession in the period 1964-1967 but not with comparing the wastage rates of different types of secondary school teachers.

Stannard (1970) investigated the supply and retention of secondary school teachers. His findings indicated a very high wastage rate for both expatriate and Zambian teachers. This study was carried out at a time when Zambian secondary school teachers comprised only 8 percent of the total teaching force. Stannard's study is valuable but the small proportion of Zambian teachers and the very different circumstances at the time of his study, such as the fact that it was conducted at a time when Zambia institutions were only beginning to produce qualified secondary school teachers, cast doubt on the applicability of his findings today. The high wastage rate reported in the study included expatriates who at that time were the majority of the teaching force (92 percent); as these were employed on the basis of contracts usually lasting three years, it is not surprising that they manifested a high wastage rate.

Sanyal et al. (1976) studied higher education and the labour market in Zambia. They showed that the supply of Zambian teachers from the training institutions between 1972 and 1974 had exceeded the targeted output. This created the impression that Zambianisation was ahead of planned targets. The study, however, pointed out that the teaching service suffered from both high graduation and active teaching wastage in the same period. Average wastage was put at 21

percent. Sanyal and his colleagues made no attempt to compare teacher wastage according to subject specialization and sex though they looked at all categories of teachers from different institutions.

Jackman (1977) investigated the issue of Zambianisation of the secondary school teaching force from 1970 to 1974. He found a wastage rate of 18 percent among Zambian secondary school teachers for the period. This study did not show how wastage affects different types of teachers on the basis of their subject specialization. Moreover, it was conducted at a time when Zambian teachers were still few in the system. In 1977, there were 2,952 university graduate teachers teaching in Zambian secondary schools but only 271 of these were Zambians (Siwo, 1978).

In a study on wastage among trained Zambian teachers between 1970 and 1979, Shaw (1979) introduced the useful distinction between graduation and active wastage. The former refers to trained teachers who do not join teaching after successfully completing their training while the latter refers to trained teachers who were in actual service but subsequently left teaching. This study found a total teacher wastage for the period of between 12 and 13 percent from all institutions. It further reported that graduation wastage from the University of Zambia was higher than that from other institutions, and that both active and graduation wastage of females was higher than that of males from all institutions except

the University of Zambia where both male and female graduates tend to have the same pattern of wastage. However, this study did not attempt to compare teacher wastage from these training institutions in terms of their subject of specialization.

Bardouille (1984) investigated the mobility patterns of University of Zambia graduates by carrying out a tracer study of the 1976 cohort. Her sample included 67 teachers. She found that one quarter of the sampled teachers had not entered teaching. Among those who joined, the majority were still teaching five years later. She attributed teacher wastage to economic considerations. However, the study did not try to compare teacher wastage rates on the basis of sex and subject specialization. Moreover, as it was a cohort study for 1976, Bardouille's findings applied to the whole university population for that year and not just to teachers.

Chakulimba (1986) was interested in comparing the social status of teaching after independence (1964) to what it had been before independence in relation to other professions. His study reports a high wastage rate due to low pay and declining status. This research did not separate primary and secondary school teachers but treated them together. Moreover, it was not concerned with comparing wastage rates of secondary school teachers in terms of their sex, level or type of qualification and subject specialization.

The NATCAP Report (UNDP 1986) points out that the output of Zambian teachers for junior grades has been adequate and recruitment of expatriates for these has been discontinued, but a shortage of Zambian teachers at senior levels still exists. Thus, the Report states that in 1985, there was a shortfall of 135 Zambian graduate teachers of English, 222 of Mathematics and 235 of Science.

Kelly (1991) estimated that the wastage rate of Zambian secondary school teachers of all categories dropped from an annual average of 10.6 percent in 1976-1979 to 5.5. percent in 1980-1983 but quickly points out that, although there appears to be overstaffing in overall numbers in secondary schools, this is not the case either at the level of senior graduate teachers or teachers of certain disciplines. Neither of these studies indicates how wastage has affected different types of teachers.

All previous work in this area has dealt with the well-known fact that there is teacher wastage from the teaching service and have endeavoured to quantify the magnitude of the loss. However, some of these studies were carried out at a time when Zambia relied heavily on expatriate teachers (Moores, 1968; Stannard 1970). Moores' sampling technique was unsystematic. Sanyal et al. (1976) and Jackman (1977) conducted their studies when Zambian secondary teacher training institutions had not yet had time to produce a large supply of teachers and when the demand for educated manpower for other sectors of the economy was generally very high. Other

studies did not focus on comparing Zambian secondary school teachers' wastage rates in terms of teacher qualification, subject specialization and sex (Shaw, 1979; Bardouille, 1984; Chakulimba, 1986; UNDP, 1986; Kelly, 1991). It is with a view to filling this gap in research that the present study was conducted.

CHAPTER THREE

RESEARCH METHODOLOGY

A non-experimental historical trace method was used to follow the choice patterns of Zambian secondary school teachers trained between 1984 and 1988. What was required for this method was to identify from documentary sources particular teachers, their sex type of qualification, area of specialization, year of graduation, whether they entered teaching after successfully completing training and how long those who entered teaching remained on the teaching staff of schools.

The initial data sources were graduation records obtained from actual secondary school teacher training institutions. From these the following information was extracted: name, sex, year of graduation, subject of specialization and type of qualification obtained for all Zambians who trained as secondary school teachers in 1984-1988.

The other source of data was the Ministry of Education headquarters where posting lists and staff returns were sought. Unfortunately not all the documents required could be found because of the Ministry's system of keeping records. After failing to obtain at the Ministry headquarters secondary school teacher posting lists and staff returns for the years 1984 to 1988, the researcher visited some provincial education headquarters where it was hoped

some of the data sought would be found. From the posting lists it was necessary to get teaching service numbers, regions and schools to which particular teachers were posted. The staffing returns were expected to show whether particular teachers were still in service or not. To overcome the problem of access to required information, it was decided to use the Ministry of Education monthly salary schedules (or alphas) to check whether specific teachers in the sample had reported to any school or not. If they had, their teaching service numbers were taken and used to call for their files to facilitate counter-checking with information from graduation records and the appointment letter in the file. If the information tallied, then there was certainty about having identified one of the subjects in the sample.

3.1 Population

The target population consisted in all qualified teachers from secondary school teacher training institutions in Zambia, including the University of Zambia, from 1984 to 1988.

The targeted estimated number was about 3,000 teachers (Kelly 1991, table 13.2) but after visiting actual teacher training institutions and inspecting graduation lists, it was found that the number came to 2,464 teachers of whom 781 were university graduates and 1,683 were diplomates.

3.2 Sample and sampling procedure

The population of teachers was categorized into sub-populations according to sex, type of qualification and subject of specialization. This classification resulted in ten categories or sub-populations, initially estimated at 300 subjects per group, namely:

- a. Male graduate language and social science teachers.
- b. Male graduate science teachers.
- c. Female graduate language and social science teachers.
- d. Female graduate science teachers.
- e. Male diploma language and social science teachers.
- f. Male diploma science teachers.
- g. Male diploma industrial arts teachers.
- h. Female diploma language and social science teachers.
- i. Female diploma science teachers.
- j. Female diploma industrial arts teachers.

After classification, a five percent stratified random sample was drawn from each sub-population (estimated at 300 teachers). This meant that each sub-population was to contribute 15 subjects towards the total sample of 150 subjects. The diagram on page 24 illustrates the sampling procedure.

**DIAGRAM FOR SAMPLING PROCEDURE
POPULATION**

3,000
(2,464)

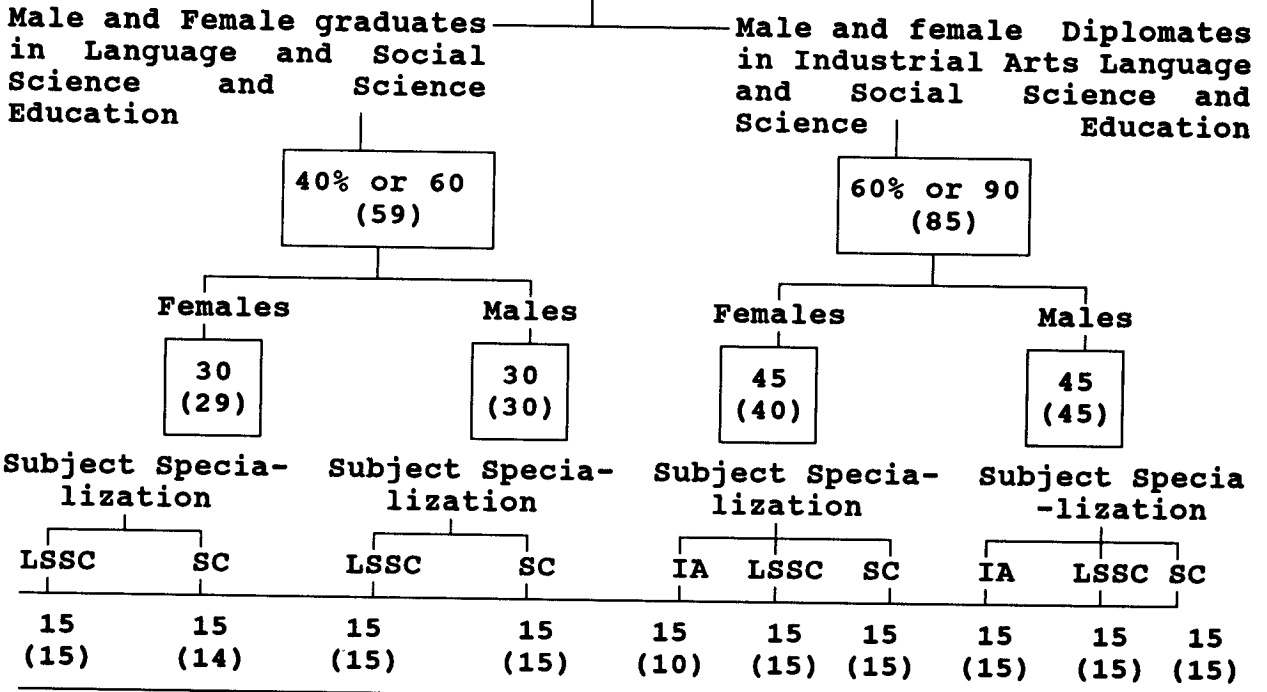
**CLASSIFIED SUB-POPULATIONS ACCORDING TO SEX, QUALIFICATION AND
SUBJECT SPECIALIZATION**

MBSC	FBSC	MBA	FBA	MLSSC DIP	FLSSC DIP	MSC DIP	FSC DIP	MIA DIP	FIA DIP
300 (174)	300 (14)	300 (446)	300 (147)	300 (900)	300 (344)	300 (303)	300 (38)	300 (88)	300 (10)

SAMPLE

150
(144)

= STRATIFIED RANDOM 5%



TOTAL NUMBER OF SUBJECTS = 150 (144).

Note: The figures in brackets represent the actual numbers that formed the population, sub-populations and those picked for each cell of the sample while the others are the theoretical entries.

KEY

1. MBSC - Male Bachelor of Science
2. FBSC - Female Bachelor of Science
3. MBA - Male Bachelor of Arts
4. FBA - Female Bachelor of Arts
5. MLSSC Dip - Male Language and Social Science diploma
6. FLSSC Dip - Female Language and Social Science diploma
7. MSC Dip - Male Science diploma
8. FSC Dip - Female Science diploma
9. MID Dip - Male Industrial Arts diploma
10. FIA Dip - Females Industrial Arts diploma

The actual sample consisted of 144 subjects randomly drawn by the use of random number tables. Since approximately two thirds of the population were diplomates and one third were graduates, the sample was drawn so as to give 90 diplomates (60 percent) and 60 graduates (40 percent). The small deviation of the sample from the diplomate - graduate balance in the population was necessary in order to ensure adequate representation on a male-female basis.

In cases where the number of teachers in a particular sub-population was too small to be sampled, such as female industrial arts and female graduate science teachers, the whole sub-population was taken as part of the sample. This explains why the actual sample has 144 subjects instead of the targeted 150 subjects. Shortfalls in the number of individuals in sub-populations mentioned above also explain why it was not possible to get 15 subjects to fill each cell in the diagram for sampling procedure. The identified subjects for the sample were then traced through posting lists, staff returns, and teaching personnel files.

3.3 Research Instruments

Since the research design for this study followed a non-experimental historical framework, there was no need for instruments such as questionnaires and interviews in collecting data. Instead, checklists were used to physically examine documentary sources of information such as graduation records, posting records, staff returns, teaching service files and monthly

computer printouts of salary schedules that provided the necessary data which answered the questions implied in the hypotheses. Below are examples of the checklists.

Check List A

Name of institution.....
Year of graduation.....
Name of participant.....
Sex.....
Subject(s) studied.....
Qualification obtained.....

Check List B

Name of sample member.....
Province of posting.....
School/station of posting.....
Was participant still teaching by October, 1991?.....

Because the research design was non-experimental and depended on gathering documentary data, a pilot study was not undertaken.

3.4 Data collecting procedures

Data were collected during the months of September, October and November 1991. All secondary teacher training institutions were visited and graduation records of all Zambian teachers who had graduated between 1984 and 1988 were examined and a population of

2,464 names was identified.

This population was then categorized into ten sub-populations based on sex, type of qualification and subject specialization. Thereafter names of all individuals in each sub-population were listed covering the years 1984-1988. Then using a table of random numbers 15 subjects were randomly drawn from each sub-population and these randomly drawn subjects constituted the sample for the study.

Having drawn the sample, the next task was to find out those members of the sample who joined or did not join the teaching profession after graduating. This was accomplished by first establishing whether each member of the sample had been posted to a province through a check of the provincial postings list. Where these were not available, staff returns and monthly salary schedules were used as an alternative. If one of the names in the sample did not appear on any of the said documents, it was taken that the subject never entered teaching. If it did appear on any of the documents, the teaching service file number was taken down and then the name and its teaching service number were traced through the staff returns to determine the individual's length of service, both in the case of those who resigned and of those still teaching.

Whenever a name and its teaching service number ceased to appear on the staff returns, the file was called for to check what had happened to the individual. The expected information from the file was either deceased, resigned or on study leave. If the file could not be found then the salary schedules were used to check whether the subject was still on the payroll or at what date he/she was left off the payroll.

3.5 Data analysis

The investigation dealt with nominal data. Hence all of its hypotheses were tested by the chi-square statistical analysis. Some of the study's findings are presented in tables and percentages.

The chi-square statistical test was used to test the existence of relationships between:

- (a) graduation and active loss on the one hand and sex on the other.
- (b) graduation and active loss on the one hand and subject specialization on the other.
- (c) graduation and active loss on the one hand and level of teacher qualification on the other.

Wastage rates between males and females, graduates and diplomates and finally between science and non-science teachers are compared in percentages.

CHAPTER FOUR

PRESENTATION OF RESULTS

This chapter outlines the study's findings and presents the results. The first part of the chapter presents data in tables and analyses it in percentages. The second part tests the investigation's six hypotheses and gives the result of each test. As data for all the six hypotheses were nominal, the chi-square test is used in all cases.

4.1 Overview

Table one (p. 30) summarizes the study's findings on the sample of 144 teachers that were picked from the population of 2,464 who had been trained as secondary school teachers between 1984 and 1988. About one quarter or 22.2% of the 144 teachers did not enter the teaching profession and roughly one fifth or 19.4% of the total sample had left teaching three to seven years later. This means that more than half, or 58.4% of the teachers were still teaching three to seven years after qualifying as teachers.

From the total sample of 144, 77.8% (112 teachers) entered teaching soon after completing training. Of the 112 teachers who joined teaching, 84 (or 75%) were still teaching while 25% had left teaching three to seven years later. Taken as a whole the figures in table one reveal that within the sub-populations or categories, graduation loss is generally higher than active loss

TABLE 1: Summary of Secondary School Teacher Attrition (1984-1988)

D E G R E E D I P L O M A

TOTAL NUMBER	<u>SCIENCES</u>		<u>LSSC (NON-SCIENCES)</u>		<u>SCIENCES</u>		<u>NON-SCIENCES</u>	
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE
Graduation loss	7 (22.2)	5 (35.7)	6 (40.0)	7 (46.6)	1 (6.7)	2 (13.3)	1 (6.7)	2 (13.3)
Joined teaching	8 (77.8)	9 (64.3)	9 (60.0)	8 (53.3)	14 (93.3)	13 (86.7)	14 (93.3)	15 (100.0)
Still teaching	5 (58.3)	6 (42.9)	4 (26.7)	5 (33.3)	13 (86.6)	12 (80.0)	13 (86.7)	9 (60.0)
Active loss	3 (19.4)	3 (21.4)	5 (33.3)	3 (20.0)	1 (6.7)	1 (6.7)	1 (6.7)	2 (20.0)
Sample size	15 (100.0)	14 (100.0)	15 (100.0)	15 (100.0)	15 (100.0)	15 (100.0)	15 (100.0)	10 (100.0)

NOTE: Figures in brackets represent percentages of raw figures. Active loss includes all those who resigned and those lost due to natural causes of death, retirement as well as those on indefinite leave. However, losses due to natural causes are minimal and in some cases non-existent.

for all teachers in the sample. This high graduation loss is

mostly due to the large number of university graduate teachers who do not enter the teaching profession.

4.2 Science and non-science teacher attrition rates

Table two (p. 32) shows that generally more science teachers (25.4%) than non-science teachers (20%) decide not to start teaching after completing training. Of those who had actually started teaching active loss for all science teachers (18.2%; 8 out of 44) was much less than the loss for all non-science teachers (29.4%; 20 out of 68). Such a finding goes against the expectation that teachers of science are more likely to abandon teaching after only a short period of time because of more job options available to them elsewhere in the economy. Contrary to this view, this study's findings show that teachers of science manifest a higher retention rate (61.0%) than teachers of non-science subjects (56.5%). This phenomenon deserves further investigation to determine its stability and possible causes.

About one quarter of both male and female science teachers did not start teaching upon completion of their training programmes (26.7% and 24.1% respectively). For non-science teachers, 25% of the females and 15.6% of the males did not join teaching. A comparison of male and female science teachers who had entered teaching in the period 1984 to 1988 shows that each group had lost 18% (4 out of 22) of its members within three to seven years. For both groups

Table 2: Graduation and active loss of science and non-science teachers (1984 - 1988)

	<u>S c i e n c e s</u>			<u>N o n - s c i e n c e s</u>		
	Both Sexes	Males	Females	Both Sexes	Males	Females
Graduation loss	15 (25.4)	8 (26.7)	7 (24.1)	17 (20.0)	7 (15.6)	10 (25.0)
Joined teaching	44 (74.6)	22 (73.3)	22 (75.9)	68 (80.0)	38 (84.4)	30 (75.0)
Still teaching	36 (61.0)	18 (60.0)	18 (62.1)	48 (56.5)	26 (57.8)	22 (55.0)
Active loss	8 (13.6)	4 (13.3)	4 (13.8)	20 (23.5)	12 (26.6)	8 (20.0)
Sample size	59 (100.0)	30 (100.0)	29 (100.0)	85 (100.0)	45 (100.0)	40 (100.0)

Note: Figures in brackets are percentages.

the retention rate of those who started teaching was over 75%. Male non-science teachers lost 32% (12 out of 38) of those who had entered teaching while females in the same category lost 27% (8 out of 30) after three to seven years. The retention rate among female non-science teachers who actually started teaching (73%; 22 out of 30) is higher than among males (68%; 26 out of 38).

4.3 Male and Female teacher attrition rates

Table three (p. 33) shows that more female teachers (24.6%) than males (20.0%) trained between 1984 and 1988 decided not to join teaching. Of those who joined teaching over the same period, the sample for males had lost 26.7% of its members while that of females had lost 23.1% within three to seven years.

Table 3: Graduation and active loss of male and female teacher (1984 - 1988)

	<u>M a l e s</u>			<u>F e m a l e s</u>		
	TOTAL	SCIENCE	NON-SCIENCE	TOTAL	SCIENCE	NON-SCIENCE
Graduation loss	15 (20.0)	8 (26.7)	7 (15.6)	17 (24.6)	7 (24.1)	10 (25.0)
Joined teaching	60 (80.0)	22 (73.3)	38 (84.4)	52 (75.4)	22 (75.9)	30 (75.0)
Still teaching	44 (58.7)	18 (60.0)	26 (57.8)	40 (58.0)	18 (62.1)	22 (55.0)
Active loss	16 (21.3)	4 (13.3)	12 (26.6)	12 (17.4)	4 (13.8)	8 (20.0)
Sample size	75 (100.0)	30 (100.0)	45 (100.0)	69 (100.0)	29 (100.0)	40 (100.0)

Overall Total: Men and Women = 144

Note: Figures in brackets are percentages.

More male science teachers (26.7%) than male non-science teachers (15.6%) decided not to enter teaching. The proportion of female science teachers who did not join teaching after completing training (24%) was almost the same as that of female non-science teachers (25.0%).

Of the 30 male science teachers in the sample, 22 became teachers in the period 1984 to 1988. However, three to seven years later 4 of these (18.2%) were no longer in the classroom.

The sample for male non-science teachers on the other hand contained 45 members of whom 38 entered teaching. At the end of three to seven years, 12 of the 38 teachers (32%) had left teaching.

Thus male science teachers appear to stay longer in teaching than male non-science teachers. Among females, analysis of the table's figures shows that the non-sciences were also more vulnerable to active loss (8 teachers lost out of 30, or 27%) than the sciences (4 lost out of 22, or 18.2%).

4.4 Degree and Diploma teacher attrition rates

Table four (p. 35) compares degree and diploma teachers. Over 40% of degree teachers (42.4%) did not begin teaching soon after qualifying compared with less than 10% of diploma teachers (8.2%). Moreover, active loss for teachers with degrees over the period under investigation was proportionately much higher (41.2%) than that for teachers with diplomas (17.9%). The retention rate of those who had chosen to start teaching is also higher for teachers with diplomas than for those with degrees, probably because a degree is more marketable than a diploma.

The proportions of science and non-science degree teachers who did not start teaching after successfully completing training were approximately the same (41.4% and 43.3% respectively). Similarly the proportions of science and non-science diploma teachers who

Table 4: Graduation and active loss of degree and diploma teachers (1984 - 1988)

	<u>D e g r e e</u>			<u>D i p l o m a</u>		
	TOTAL	SCIENCE	NON- SCIENCE	TOTAL	SCIENCE	NON- SCIENCE
Graduation loss	25 (42.4)	12 (41.4)	13 (43.3)	7 (8.2)	3 (10.0)	4 (7.3)
Joined teaching	34 (57.6)	17 (58.6)	17 (56.7)	78 (91.8)	27 (90.0)	51 (92.7)
Still teaching	20 (33.9)	11 (38.0)	9 (30.0)	64 (75.3)	25 (83.3)	39 (70.9)
Active loss	14 (23.7)	6 (20.6)	8 (26.7)	14 (16.5)	2 (6.7)	12 (21.8)
Sample size	59 (100.0)	29 (100.0)	30 (100.0)	85 (100.0)	30 (100.0)	55 (100.0)

Note: The figures in brackets are percentages.

never entered teaching after graduating were almost the same (10.0% and 7.3% respectively).

More non-science degree teachers (47.1%) than science degree teachers (35.3%) had left active service within three to seven years. Similarly, more non-science diploma teachers (23.5%) than science diploma teachers (7.4%) had left teaching within the same period of time. In other words, once a decision to enter teaching is made, science teachers, whether with a degree or diploma qualification, tend to serve longer as classroom teachers than those with non-science degree and diploma qualifications.

4.5 Male/Female Degree and Male/Female Diploma teacher attrition rates

Over the period 1984 to 1988, 43.3% of the males with degree qualifications and 41.4% of the females with similar credentials did not enter teaching (Table five; p. 36). Graduation loss over the same period for males with diploma certificates was three times (4.4%) smaller than that for females holding the same qualification (12.5%).

Table 5: Graduation and active loss of Male/Female Degree and Male/Female Diploma teachers (1984 - 1988)

	<u>D e g r e e</u>			<u>D i p l o m a</u>		
	TOTAL	MALE	FEMALE	TOTAL	MALE	FEMALE
Graduation loss	25 (42.4)	13 (43.3)	12 (41.4)	7 (8.2)	2 (4.4)	5 (12.5)
Joined teaching	34 (57.6)	17 (56.7)	17 (58.6)	78 (91.8)	43 (95.6)	35 (87.5)
Still teaching	20 (33.9)	9 (30.0)	11 (38.0)	64 (75.3)	35 (77.8)	29 (72.5)
Active loss	14 (23.7)	8 (26.7)	6 (20.6)	14 (16.5)	8 (17.8)	6 (15.0)
Sample size	59 (100.0)	30 (100.0)	29 (100.0)	85 (100.0)	45 (100.0)	40 (100.0)

Note: Figures in brackets are percentages.

Among degree-holding teachers who had decided to enter teaching after completing their training, 47.1% of the males (8 out of 17) were not in classrooms after three to seven years and 35.3% (6 out of 17) of the females had left teaching after the same period of time. As for teachers holding diploma credentials, active loss for those who had entered teaching between 1984 and 1988 was 18.6% for

males and 17.1% for females after three to seven years. The retention rate for diploma teachers was therefore much the same for males and females but not so for teachers with degree qualifications, in that more females than males with degrees tend to stay in teaching.

4.6 Male and Female Science teacher attrition rates

More male teachers holding science degrees (46.7%) than male teachers with science diplomas (6.7%) decided not to enter teaching between 1984 to 1988. Likewise more female degree science teachers (35.7%) than female science diploma teachers (13.3%) did not join teaching (Tables six, p. 38).

Of those who actually joined teaching, 37.7% (3 out of 8) of males holding science degrees were no longer in classrooms after three to seven years while only 7.1% (1 out of 14) of male science diploma teachers had left teaching after the same period of time. With regard to females who had decided to start teaching, 33.3% (3 out of 9) of those holding science degrees and 7.7% (1 out of 13) of those with science diploma certificates had left teaching after three to seven years.

The figures in the preceding paragraphs indicate that the Zambian education system loses more science graduate teachers of both sexes than science diplomate teachers, both at the entry point and from among those already in service, probably for the reason proposed earlier (p. 31) that in Zambia, a degree may be a more marketable

Table 6: Graduation and active loss of science teachers only (1984 - 1988)

SCIENCE TEACHERS ONLY

	<u>M A L E S</u>			<u>F E M A L E S</u>		
	<u>TOTAL</u>	<u>DEGREE</u>	<u>DIPLOMA</u>	<u>TOTAL</u>	<u>DEGREE</u>	<u>DIPLOMA</u>
Graduation loss	8 (26.7)	7 (46.7)	1 (6.7)	7 (24.1)	5 (35.7)	2 (13.3)
Joined teaching	22 (73.3)	8 (53.3)	14 (93.3)	22 (75.9)	9 (64.3)	13 (86.7)
Still teaching	18 (60.0)	5 (33.3)	13 (86.6)	18 (62.1)	6 (42.9)	12 (80.0)
Active loss	4 (13.3)	3 (20.0)	1 (6.7)	4 (13.8)	3 (21.4)	1 (6.7)
Sample size	30 (100.0)	15 (100.0)	15 (100.0)	29 (100.0)	14 (100.0)	15 (100.0)

Note: Figures in brackets are percentages.

qualification than a diploma.

4.7 Male and Female non-science teacher attrition rates

More male degree non-science teachers were lost at the entry point (40.0%) than male diploma non-science teachers (3.3%) (Table seven; p. 39). Similarly, more female degree non-science teachers (46.7%) than female non-science diploma teachers (12.0%) did not join teaching soon after completing training.

Among those who had decided to enter teaching, 55.6% of males (5 out of 9) holding non-science degrees had left teaching after three to seven years while 24.1% of males (7 out of 29) with diploma non-

Table 7: Graduation and active loss of non-science teachers only (1984 - 1988)

NON-SCIENCE TEACHERS

	<u>M A L E S</u>			<u>F E M A L E S</u>		
	<u>TOTAL</u>	<u>DEGREE</u>	<u>DIPLOMA</u>	<u>TOTAL</u>	<u>DEGREE</u>	<u>DIPLOMA</u>
Graduation loss	7 (15.6)	6 (40.0)	1 (3.3)	10 (25.0)	7 (46.7)	3 (12.0)
Joined teaching	38 (84.4)	9 (60.0)	29 (96.7)	30 (75.0)	8 (53.3)	22 (88.0)
Still teaching	26 (57.8)	4 (26.7)	22 (73.3)	22 (55.0)	5 (33.3)	17 (68.0)
Active loss	12 (26.6)	5 (33.3)	7 (23.4)	8 (20.0)	3 (20.0)	5 (20.0)
Sample size	45 (100.0)	15 (100.0)	30 (100.0)	40 (100.0)	15 (100.0)	25 (100.0)

Note: Figures in brackets are percentages.

science qualifications had also left. Similarly more female teachers with non-science degrees (37.5% or 3 out of 8) than female teachers with non-science diplomas (22.7% or 5 out of 22) left teaching after three to seven years.

4.8 Hypothesis testing

The first hypothesis stated that there is no relationship between graduation loss and sex for all teachers in the sample regardless of area of specialization and type of qualification.

TABLE 8: Relationship between graduation loss and sex

GRADUATION LOSS	SEX		TOTALS
	MALES	FEMALES	
ENTRANTS	60	52	112
		(58.3)	(53.6)
NON-ENTRANTS	15	17	32
		(16.6)	(15.3)
TOTALS	75	69	144

$X^2 = 0.30, p > 0.05$

NOTE: Figures in brackets are expected frequencies.

From the data in table eight (which are derived from table three) a X^2 of 0.30 is obtained which is not significant ($P > 0.05$). The study, therefore, fails to reject the null hypothesis and concludes that there is no statistical evidence for stating that sex plays any significant role in an individuals' initial decision whether or not to begin teaching.

The second hypothesis is that there is no relationship between graduation loss and area of specialization for all teachers in the sample regardless of sex and type of qualification.

TABLE 9: Relationship between graduation loss and area of specialization

GRADUATION LOSS	AREA OF SPECIALIZATION		TOTALS
	SCIENCE	NON-SCIENCE	
ENTRANTS	44	68 (45.9)	112 (66.1)
NON-ENTRANTS	15	17 (13.1)	32 (18.9)
TOTALS	59	85	144

$X^2 = 0.59, p > 0.05$

NOTE: Figures in brackets are expected frequencies.

From the data in table nine, (which are derived from table two) a X^2 of 0.59, which is not significant ($p > 0.05$), was derived. The investigation fails to reject the null hypothesis and concludes that the statistical evidence does not uphold the assertion that area of specialization has any significant influence on a trained secondary school teacher's initial decision either to join or not to join teaching after successfully completing training.

Thirdly, it was hypothesised that there is no relationship between graduation loss and type of teacher qualification for all subjects in the sample regardless of sex and area of expertise.

TABLE 10: Relationship between graduation loss and type of qualification

GRADUATION LOSS	TYPE OF QUALIFICATION		TOTALS
	DEGREE	DIPLOMA	
ENTRANTS	34 (45.8)	78 (66.1)	112
NON-ENTRANTS	25 (13.1)	7 (18.8)	32
TOTALS	59	85	144

$$X^2 = 22.80, p < 0.01$$

NOTE: Figures in brackets are expected frequencies

Table ten consists of data derived from table three. On the basis of these data a X^2 of 22.80 which is statistically significant ($p < 0.01$) was obtained. The study thus fails to accept the null hypothesis and concludes that the type of qualification has a statistically significant influence on a qualified secondary school teacher's decision whether or not to start teaching. More teachers with degrees (25 out of 59) than teachers with diplomas (7 out of 85) decide not to enter teaching soon after completion of their training programmes.

A further hypothesis was that there is no relationship between active loss and sex for all teachers in the sample regardless of type of qualification and area of specialization.

Table 11: Relationship between active loss and sex

ACTIVE LOSS	SEX		TOTALS
	MALES	FEMALES	
SERVING TEACHERS	44 (45)	40 (39)	84
LEAVERS	16 (15)	12 (13)	28
TOTALS	60	52	112

$X^2 = 0.19, p > 0.05$

NOTE: Figures in brackets are expected frequencies

From the data in table eleven (p. 43) (which are derived from table three), a X^2 of 0.19, which is not significant ($p > 0.05$), is obtained. The investigation, therefore, fails to reject the null hypothesis and concludes that sex does not play a significant role in a serving teacher's decision to leave classroom teaching.

The fifth hypothesis was that there is no relationship between active loss and area of specialization for all teachers in the sample regardless of type of qualification and sex.

Table 12: Relationship between active loss and area of specialization

ACTIVE LOSS	AREA OF SPECIALIZATION		TOTALS
	SCIENCE	NON-SCIENCE	
SERVING TEACHERS	36 (22.0)	48 (37.0)	56
LEAVERS	8 (24.4)	20 (37.6)	62
TOTALS	44	68	112

$$X^2 = 33.90, p < 0.001$$

NOTE: Figures in brackets are expected frequencies

Data in table twelve are drawn from table two. From these data, a highly significant x^2 of 33.90, $p < 0.001$, is obtained. The study, therefore, fails to accept the null hypothesis and concludes that a statistically significant relationship exists between the variables. This means that the area of subject specialization plays a significant role in a serving teacher's decision to leave classroom teaching. More serving teachers of non-science subjects leave classroom teaching than serving teachers of science subjects.

Finally, it was hypothesised that there is no relationship between active loss and type of qualification for all teachers in the sample regardless of sex and area of specialization.

Table 13: Relationship between active loss and type of qualification

ACTIVE LOSS	TYPE OF QUALIFICATION		TOTALS
	DEGREE	DIPLOMA	
SERVING TEACHERS	20 (25.5)	64 (58.5)	84
LEAVERS	14 (8.5)	14 (19.5)	28
TOTALS	34	78	112

$X^2 = 6.85, p < 0.01$

NOTE: Figures in brackets are expected frequencies

On the basis of data from table thirteen (which are derived from table four) a x^2 of 6.85 is obtained which is statistically significant, $p < 0.01$. The investigation thus fails to accept the null hypothesis and, therefore, concludes that the type of qualification held plays a significant role in a serving teacher's decision to leave classroom teaching. This is exemplified by the large active loss of degree-holding teachers.

CHAPTER FIVE

Discussion and Recommendations

This chapter summarizes and discusses the study's findings and gives some recommendations regarding the problem. Briefly, it was found that a relationship exists between both graduation and active loss on the one hand and type of qualification on the other and between active loss and area of subject specialization. No relationship was found, however, between sex and either graduation or active loss or between graduation loss and subject specialization.

5.1 Graduation loss and sex

The study did not find any evidence that showed that in Zambia the sex of an individual secondary school teacher influences the decision to join or not join teaching after successfully completing training. Figures in table three (p. 33) show that there is not much difference between the graduation loss of males (20% or 15 out of 75 males did not start teaching) and that of females (24.6% or 17 out of 69 females did not start teaching).

This finding is not in accord with Shaw's (1979, p.44) study whose investigations showed that generally, for all institutions, the graduation wastage of females was higher than that of males except for the University of Zambia where the pattern was the same for both sexes.

5.2 Graduation loss and area of specialization

The subject area in which a trained Zambian secondary school teacher has specialized, that is science or non-science, has no significant influence on the teacher's initial decision either to enter or not enter the teaching profession soon after successfully completing teacher training. Whatever the decision that is made, it should not be attributed to the subject area that one has specialized in only but to an interplay of other variables not considered in this study.

In testing for the existence of a relationship between graduation loss and area of specialization, the study obtained results that were not statistically significant. The study therefore failed to reject the null hypothesis of no relationship between the variables. Data in table two (page 32), which compares science and non-science teachers, also show that in general, there is no appreciable difference between the graduation loss of science teachers (25.4% or 15 out of 59) and that of non-science teachers (20% or 17 out of 85).

A finding of this nature is not in conformity with the general expectation that the decision to join or not to join teaching upon completion of teacher training has something to do with the subject area one has specialized in. Indeed, one would expect more teachers trained in sciences to decide not to enter teaching compared to those whose specializations are in non-science

subjects. This is certainly the case in O.E.C.D. countries and other highly industrialized nations where science and mathematics teachers are difficult to recruit because of high salary possibilities that are open to such teachers in business and industry (Murnane 1987; Wagner 1987; Orivel and Perrot 1987; Chapman 1983); but this is not so in the case of Zambia in that graduation loss for science and non-science teachers, though high, is much the same for both categories.

The explanation for the discrepancy in the case of Zambia may be that access to employment, though related to educational qualification, does not so much depend on professional qualification, merit or the subject area one has specialized in. Instead, socio-economic and socio-political background or connections at an individual's disposal may also come into play. If one lacks the "right" connections, it may not be easy for such an individual to choose what job to take since employers may use some other criteria for recruitment. Saasa succinctly summarises this situation when he points out that

Zambian public enterprises have often been abused by politicians for the purpose of realizing their political ends ... As a result of this political factor, loyalists have often been appointed to senior managerial positions at the expense of deserving individuals and often disregarding the need to consider the relevant training and experience. ... and these companies have been used

to create employment even when economic wisdom dictates otherwise (1992, p. 6).

Public enterprises or parastatal companies are the second major employer in Zambia after government. It follows, therefore, that access to employment for a secondary school diplomate or graduate teacher outside teaching upon his/her successful completion of training does not always depend on the individual's area of specialization but on some other criteria or screening mechanism determined by interpersonal relationships between individuals in society. Such variables, however, were not examined in the investigation; hence, there is room for other studies to explore them further.

5.3 Graduation loss and type of qualification

The investigation has established that the type of qualification, that is, possession of either a degree or a diploma, significantly influences a qualified secondary school teacher's choice of whether to join teaching or not.

In testing for the existence of a relationship between graduation loss and type of qualification, a significant chi-square of 22.80 ($p < 0.01$) was obtained. The study failed to accept the null hypothesis of no relationship between the variables. The result of the statistical test is further amplified by analysis of the data in table four (p.35) which compares the behaviour of two samples of

newly qualified teachers, some holding degrees and some holding diplomas, with regard to joining or not joining teaching. Of the teachers that had just obtained their degrees from the University of Zambia, 42.4 percent (25 out of 59) decided not to enter teaching while only 8.2 percent (7 out of 85) of those who had just obtained diplomas from colleges decided not to join teaching over a five year period (1984 to 1988). This finding is in line with what Shaw (1979, p.44) found in that, when he compared the graduation wastage from different institutions, the immediate and obvious difference was the extremely high graduation wastage of university graduates compared with that from the other institutions.

5.4 Active loss and sex

Once the initial decision to enter teaching has been made, sex does not play a significant role in an individual's choice whether or not to leave classroom teaching. The decision to leave active service in teaching may be attributed to other considerations but not necessarily to an individual's sex alone.

When the relationship between active loss and sex was tested, a chi-square of 0.19 ($p > 0.05$) was obtained. Thus, the null hypothesis of no relationship between the variables was not rejected. In addition, analysis of data in table three (page 30), which compares the behaviour of two samples of male and female teachers who had chosen to enter teaching immediately after they

completed their training, indicate that 26.7% of males (16 out of 60) and 23.1% (12 out of 52) of females had left teaching some three to seven years later. These figures demonstrate that, though active loss for both males and females was high, there was very little difference between individuals on the basis of sex.

The above finding corroborates a finding of Sanyal et al. (1976, p.11) who found that no statistically significant distinction could be made between male and female Zambian teachers in their tendency to leave teaching. However, it contradicts the finding of Shaw's study (1979) which showed that the active loss of female teachers who had graduated from institutions was higher than that of males, except for the University of Zambia where it was the same. The explanation for the discrepancy between the findings of the two studies may be that there were many employment opportunities open to female secondary school teachers in the economy at the time of Shaw's study in the 1970s. There were vacancies, for example, in personnel departments of parastatal companies and clerical jobs in banks which absorbed the females. Such vacancies have since been filled and in the 1990s exist to a more limited extent. The massive redundancies and lay-offs prevalent in the economy today are indicative of industry's reduced absorptive capacity for more employees.

Another explanation may be that female secondary school teachers in active service and married to husbands holding fairly well-paying jobs may have found conditions of service in teaching satisfactory and are thus content. For example, female teachers may be induced to remain in teaching because it gives them more time to attend to their families in that teaching has a relatively short working day, three fairly lengthy vacations a year when pupils break off for holidays, two and a half leave days earned per month, and a regular income.

5.5 Active loss and area of specialization

The subject area in which a Zambian secondary school teacher has specialized significantly influences that individual's decision to terminate his or her career mid-way.

When data relating to the two variables of active loss and subject area of specialization were tested, a chi-square of 33.9 ($p < 0.001$) was obtained. In the light of this result, the null hypothesis of no relationship between active loss and area of specialization could not be accepted. Furthermore, examination of data in table two (page 32), which compares the behaviour of science and non-science teachers who had chosen to enter teaching, reveals that the active loss of 29.4 percent (20 out of 68) of all non-science teachers was much higher than that of 18.2 percent (8 out of 44) for all science teachers.

This outcome clearly demonstrates that after recruitment into teaching, Zambians trained to teach science subjects tend to stay longer in service than those trained to teach non-science subjects. Such a finding is not in accord with the general expectation of difficulties in retaining science teachers in Zambia and other countries in the world. For example, in O.E.C.D. countries such as the USA, the UK and France, it is found that, unlike teachers of non-science subjects, science teachers are not easy to retain in teaching because of more job opportunities with better pay and other conditions of service available to them elsewhere in the economies of such countries (Coombs, 1985; Orivel and Perrot, 1987; Murnane, 1987; Wagner, 1987). In the case of Zambia, part of the explanation may be that industries and other sectors of the economy are generally more management and consumption oriented and hence employ more arts graduates (including teachers) than scientists. Secondly, employers prefer to engage graduates from the university School of Natural Sciences than those who have a science-with-education degree because pure science graduates have done more courses in a given area and are thus more specialized than those who followed the science-with-education programme. Teachers with a degree of Bachelor of Science with Education, therefore, have a restricted market outside teaching unlike those with a Bachelor of Arts with Education degree.



5.6 Active loss and type of qualification

Type of qualification held plays a significant role in an individual's decision to terminate his or her teaching career midway. A chi-square test of the relationship between active loss and type of qualification had a value of 6.85 which was statistically significant ($p < 0.01$). In addition, a comparison of the behaviour of degree and diploma teachers who had chosen to enter teaching after completing their training shows that nearly half the sample of degree holders (41.2 percent or 14 out of 34) terminated their jobs three to seven years later while 17.9 percent of teachers with diplomas (14 out of 78) left after the same period (table four, p. 35).

This tendency of large numbers of university graduate teachers to leave teaching compared to teachers holding diplomas is similar to what Shaw (1979, p. 52) found when he showed that university graduates have a greater propensity to leave teaching once they have entered. His study found that their wastage was about twice the total wastage and almost three times that of students from Nkrumah Teacher's College. Shaw attributed the high active loss of university graduate teachers to the influence of the greater marketability of a university degree and the large differentials of salary and other benefits between a graduate teacher and a graduate employed elsewhere in the economy. This study's finding, and that of Shaw, contradict the finding of Pavalko (1970) who showed that in Florida USA, level of education, that is whether one had

attended a two year county teachers' college or received a bachelor's degree, is unrelated to persistence in teaching, but the reason for the discrepancy may lie in the substantial differences between the labour markets in Florida and in Zambia.

5.7 Summary/conclusion

The investigation has established that graduation loss is related neither to sex nor to area of subject specialization but is related to type of qualification held by a teacher. It further showed that active loss is not related to sex but it is related to qualification and area of subject specialization.

The principal findings were:

- a. No relationship was established between graduation loss and sex.
- b. Graduation loss for males and females was the same, at about 15 to 20 percent.
- c. No relationship was established between graduation loss and area of subject specialization.
- d. The proportions of science and non-science teachers who decided not to join teaching after graduation from training institutions did not differ significantly.
- e. A significant relationship was established between graduation loss and type of qualification a teacher holds.
- f. A larger proportion of degree holders than diploma holders decided not to enter teaching.

- g. A significant relationship was established between active loss and area of subject specialization.
- h. A larger proportion of non-science than science teachers who had joined teaching between 1984 and 1988 had terminated their teaching careers three to seven years later.
- i. Active loss and type of teacher qualification have been shown to be significantly related.
- j. A larger proportion of university graduate teachers than college graduates who had chosen to enter teaching upon successful completion of training left teaching after three to seven years.
- k. No relationship was established between active loss and sex.
- l. The proportions of male and female teachers who joined teaching between 1984 and 1988 but left teaching three to seven years later was roughly the same.

5.8 Other factors related to teacher loss

The objectives of this study were to establish whether or not graduation and active teacher losses in Zambian secondary schools are related to sex, area of specialization and type of qualification. Establishing causes for teacher loss fell outside its parameters. However, the investigation would not be complete unless reference were made to other possible factors that may influence teacher loss.

Previous work on this area in Zambia and elsewhere in the world has shown that economic and social reasons are the principal factors that influence individuals in making the choice to join or not to join teaching and subsequently remain or not remain in it. If the decision to enter teaching has already been made, the same economic and social aspects of teaching relative to other occupations will influence a serving Teacher's decision either to continue working or to move out of teaching (Moore, 1968; Stannard, 1970; Sanyal et al. 1976; Tiberondwa, 1976; Chapman, 1983; Chakulimba, 1986; Wagner, 1987). Speaking of the social and economic aspects of teaching, Wagner states that the social aspects are those

"which have no direct monetary value such as working conditions, workload, job responsibility, school and community resources, social recognition and social status. Economic aspects include salary and fringe benefit packages, job security, prospects for mobility and the length of the workday and year." (1987, p.5)

These social and economic aspects of teaching may take on either positive (benefit) or negative (disincentive) values which do not necessarily remain the same over time. For example, social and economic aspects of teaching valued highly by teachers in pre-independent Zambia such as ability to read and write letters for people in the community, being a link between the people in the community and the colonial master, a relatively high income and a high social status, do not prevail any longer because many people

can now do what a teacher does and other occupations pay better salaries and have a higher social status (Tiberondwa, 1976; Chakulimba, 1986). Both social and economic aspects of teaching are important and are interconnected in attracting prospective individuals to enter teaching. The two factors are also critical in retaining staff that are already in service. However, without further research it is difficult to say which of the two is more important in influencing individuals to decide either to join or not join teaching or, having joined, in influencing them either to move out of the teaching profession or continue teaching. In Zambia, government and public attention is focused more on economic than social aspects. There is considerable room for further investigation in this area.

5.9 Recommendations

This study has established the existence of different factors affecting graduation and active teacher loss in the Zambian education system. Other studies have found that the decision to enter a given profession and continued service in it or its termination are closely linked with the social status and material incentives represented by the salary and conditions of service that go with it (Ontario Secondary School Teacher's Federation, 1961; Jackman, 1977; Shaw, 1979; Chakulimba, 1986). In view of the identified factors that come into play regarding the choice to enter teaching and remain in it, the social and economic aspects of teaching relative to other occupations requiring similar

qualifications need to be constantly reviewed to match standards in other sectors. This is one way of ensuring that qualified teachers actually take up teaching as a career and that the education system retains and motivates those already in the system.

This investigation has shown that the secondary school sector in Zambia loses more university trained teachers than those trained from colleges, both at the entry point and from among those already in service. The explanation for this situation according to Sanyal et al. (1976) is the large salary differentials between a university trained teacher in teaching and that of a university trained teacher employed outside teaching. In 1976, graduate teachers employed in teaching received 72.2% less per month (K230.60) than those who had moved out of teaching (K399.40 per month). It would appear that until salary levels for teachers are made the same as those in industry the secondary school sector will continue to lose trained graduate teachers. Furthermore, even among government departments starting salary scales for university graduates were not always the same but until recently were to the disadvantage of teachers. For example, in 1985, a four year trained graduate teacher who decided to join the teaching service commenced at Education Scale 12 (ES12) which was K6, 792 p.a with K294.00 yearly increment. Another four year trained graduate teacher who joined a different government department, for example in personnel, the anti-corruption commision or country and town planning, was put in the general professional scale (GPS9) whose

entry point was K7,236.00 p.a plus K300.00 annual increment (Government Paper No 1 of 1985).

The anomaly in this case is that those graduates who joined teaching were not recognised as professionals unlike their counterparts with similar credentials who chose to join other government departments. This anomaly remained in place up to May, 1992. Given such a situation, it is indeed not surprising that the education system lost many university trained teachers.

Another reason accounting for more losses among graduate teachers than diplomates may be that a teaching diploma is more tailored to classroom teaching, but a degree with education being a broader and more general qualification may be marketable outside teaching.

This issue could be addressed by making the teaching degree programme at the University of Zambia more specific to teaching needs as one way of reducing losses among graduate teachers. This could be accomplished, for example, by making it a Bachelor of Education instead of the present Bachelor of Arts or Science with Education. A secondary school teaching diploma which is more tailored to teaching needs appears less susceptible to attrition. Changing the teaching degree programme may thus be a step in the right direction.

The massive graduation and active attrition of graduate teachers in the secondary school sector as shown by this study have had two negative consequences. The first is that diploma teachers are being asked to take senior classes in subjects and levels (content) that they are not trained to handle. This frequently exposes their incompetence to teach at the senior level. Such teachers suffer a loss in confidence and morale which negatively affects not only the quality of their teaching but ultimately the cognitive accomplishments of their students.

Secondly, the government policy of Zambianising secondary school staffing is gradually being reversed in that more and more expatriate teachers have to be recruited to replace Zambian graduate teachers who are in high demand in neighbouring Southern African countries. It would appear that the government is overlooking the disadvantages of relying on expatriate teachers. Currently, expatriates number about 20 percent of the entire secondary school teaching force. However, government's decision in May 1992, to introduce a 20 percent retention and professional allowance over and above the gross salary for all graduates in public service employment is a positive and commendable step towards curbing the exodus of highly trained manpower, particularly of teachers.

The investigation did not find differences in teacher attrition on the basis of sex. This may be related to two facts, the first of which is that there are fewer female (1,474) than male (4,424) secondary teachers (MGEYS, 1991, p. 72) and the second being that employment prospects for women are poorer than that for men, as women constitute only 7.3% of the wage labour force (GRZ, 1989, p. 44). Since the pool from which active wastage of female teachers occurs and their absorption rate in the economy are both small, it is indeed not surprising that their wastage does not exceed that of males who are so much more numerous and have access to such a wide range of employment opportunities. This does not explain, however, why the active wastage of male teachers is not much larger than that of females.

To achieve a better sex-based balance in terms of employment prospects in the economy, including teaching, the government should take steps to increase the proportion of female teacher trainees in secondary teacher training colleges. An increase in the proportion of female teachers would provide more role models in secondary schools. This in turn might encourage the increased participation of girls in secondary education and ultimately that of women in higher or tertiary education.

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