A STUDY OF THE EFFECTS OF TEACHER MENTORING PROGRAMME ON THE TEACHING COMPETENCE OF BEGINNING SECONDARY SCHOOL SCIENCE TEACHERS

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A THESIS SUBMITTED TO THE DEPARTMENT OF
CURRICULUM STUDIES
SCHOOL OF POSTGRADUATE STUDIES
UNIVERSITY OF LAGOS
AKOKA – YABA
LAGOS
NIGERIA.

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

FEBRUARY 1999

DEDICATION

To my loving husband, Dr Charles Adebowale Oke

and children

Tola, Kunle and Tokunbo.

SCHOOL OF POSTGRADUATE STUDIES
UNIVERSITY OF LAGOS

CERTIFICATION

This is to certify that the thesis: A STUDY OF THE EFFECTS OF TEACHER MENTORING PROGRAMME ON THE TEACHING COMPETENCE OF BEGINNING SECONDARY SCHOOL SCIENCE TEACHERS

Submitted to the
School of Postgraduate Studies
University of Lagos

For the award of the degree of

DOCTOR OF PHILOSOPHY (Ph.D)

is a record of original research carried out

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DECLARATION

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I declare that the above-named thesis has been written by me, the work of which is a record, has been done by me, and it has not been accepted in any previous application for a higher degree.

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ACKNOWLEDGEMENT

I am grateful to God whose Grace has been my sustenance throughout the period of this study.

I would like to express my profound gratitude to my able supervisors- Prof. T.O. Odunusi and Dr. T.D. Baiyelo who served as my sources of inspiration throughout the study. Their diligence, constructive criticisms and thoroughness throughout the duration of the study have made possible any good quality with which this thesis may be accredited.

I wish to thank Prof. A.O. Osiyale, my very first supervisor and Dr. K. Soyibo who stimulated my interest in the topic.

I am also greatly indebted to Prof. K. A. Adegoke, Dr. V. B. Owhotu, Dr. (Mrs) O.O. Busari and Dr. (Mrs) G.C. Aniche for their constant support, invaluable advice and benefit of their experience.

My thanks also go to the lecturers in the department – Prof. D.O. Osisanya, Prof Duro Ajeyalemi, Dr. M.A. Bidmos, Dr (Mrs) F.A. Osanyin, Dr (Mrs) G.O. Esiobu, Dr. Akande, Dr. A.O. Ogunleye, Dr. Nna. They all gave me the necessary encouragement which I quite appreciate.

I am also grateful to those who have in one way or the other influenced my achievements so far. I am extremely grateful to Mrs. A.A. Ajiboye, Mr. A.F

Orukotan, Mr. M.O. Oshodi, Mr. J.A. Adewoyin, Mrs. R.O. Fagbohun, Mrs. A.I. Fabiyi, Mrs. E.A. Ajayi, Dr. S.A. Oladipo, Dr. Akinyemi, Dr. O.B. Jegede, Mr. Jolly Kukuru, Mrs. M. Lawal and Mr. Olufowobi. They all played positive roles in making the completion of this study a reality.

I also wish to express my thanks to Mr. S.A. Oyelade, Mr. C.A. Aderogba Mr. Ben Okhumale and Mr. Abdul (all NNPC staff) for the invaluable assistance rendered in producing this thesis. The co-operation received from the staff and students of the secondary schools sampled for this study contributed immensely to its success. I appreciate it all with many thanks.

Special thanks go to my dear mother, Mrs Alice Adetoun Lasebikan, my Pastor and his wife Rev. and Mrs. Ademola Adeyi for their concern, encouragement when my spirit sagged and constant prayer for my success.

Finally I would also like to express my special indebtedness to my loving husband – Dr. Charles Adebowale Oke for his unalloyed support and tolerance even when the home front suffered, and my children and in-law Miss Olanike Oladejo for tolerating the inconveniences and for making the decade long duration of the study trouble free. Without their support and tolerance, the completion of this study would have been a mirage.

ABSTRACT

This study investigated the effects of a teacher mentoring programme on the performance of the beginning secondary school science teachers. A sample of 80 randomly selected beginning secondary school science teachers was pre-tested to assess their prior teaching competencies. They were then grouped into experimental and control groups. The experimental group was mentored for twelve weeks and the two groups were post-tested to determine the effect of mentoring.

Five research instruments – Questionnaire, Interview schedule, Observational schedule and logbook – were used to generate data which were analysed using descriptive and inferential statistics.

The major results were as follows:

(1) It was found that the TMP (experimental treatment) had significant effects on the teaching competence of the beginning teachers involved in the progrmme ($F = 45.80$; $df = 38$; $p < 0.05$). The beginning teachers' teaching competence were significantly improved after the TMP treatment.

(2) The TMP significantly improved the teaching competence of both professional and non-professional teachers involved in the programme ($t = 2.92$; $df = 38$; $p < 0.05$).

(3) There were significant differences in the teaching competence of beginning teachers attached to teacher mentors ($t = 2.92$; $df = 38$; $p < 0.05$) and those not attached ($t = 0.45$; $df = 38$; $p > 0.05$). The TMP produced an immense positive effect on the teaching competence of the mentored beginning teachers. The teachers that were mentored were significantly more competent than those not mentored.

(4) There were no significant differences in the teaching competence of the mentored beginning secondary school science teachers based on qualification and length of teaching experience. TMP fostered significantly the development of teaching competence on beginning secondary school Science teachers irrespective of qualification ($F = 1.42$; $df = 2/37$; $p > 0.05$) and teaching experience ($F = 1.96$; $df = 2/37$; $p > 0.05$).

(5) Gender had no significant effect on the teaching competence of the beginning secondary school science teachers involved in TMP. The teaching competence of both male and female teachers involved in TMP were at par ($t = 1.83$; $df = 38$; $p>0.05$).

Based on these findings, a Teacher Mentoring Programme for New Entrants into the profession [TMPNE] was proposed and validated. This was done in an attempt to suggest ways of improving the quality of induction and supervision of new recruits and pre-service teachers on practicum. The proposed TMPNE is also expected to serve as a means of providing a cost – effective and on - the – spot

(school- site – based) induction and in – service training of the secondary school science teachers.

Implications were drawn while recommendations and suggestions for future studies are hereby stated in the report.

TABLE OF CONTENTS

CHAPTER THREE: METHODOLOGY

CHAPTER FOUR: RESULT OF THE PILOT STUDY

CHAPTER FIVE: DEVELOPMENT AND VALIDATION OF THE MENTOR-BEGINNER DYAD TRAINING PACKAGE (A TEACHER MENTORING PROGRAMME FOR FIRST YEAR TEACHERS)

CHAPTER SIX: SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

BIBLIOGRAPHY

APPENDICES

LIST OF TABLES

TABLE

LIST OF FIGURES

CHAPTER ONE

STATEMENT OF THE PROBLEM

1.1 INTRODUCTION

A persistent problem in teacher education is that beginning teachers experience a " transition shock" during their first year(s) of service (Corcoran, 1981). Many studies have shown that beginning teachers start their professional career full of ideals from theories learnt in schools and that the first emotional experiences in the teaching situation make many young teachers depressive and irritable. Fohl Brodt, [1978]; Ogunsola, [1975]; De-vos, [1980]; and Olgers and Riesenkamp, [1979] studies traced the origin of the transition shock to gap between school practices and theories taught at the teacher's training colleges. Veeman (1984) suggested that beginning teachers experience difficulties because teaching is probably the only profession that expects its beginners to be responsible for the same work expected of experienced veterans.

In the medical profession, persons entering their medical internship typically hold the belief that they are going into a very difficult year. They foresee a year in which they will rely heavily on their more experienced colleagues. New teachers tend to think that they are going to be excellent teachers from their first month in the field. Some intend to change education in a few years. In the 1920's through 1950's pupil-teachers were trained on the job under the watchful eyes of master teachers ensuring adequate supervision. Ogunsola (1975) recalled that in the

1950's, pupil-teachers received one hour daily instruction from the head teacher on how to teach. Today, nobody accepts responsibility for helping beginning teachers who require more supervisory help.

The problem of inadequate induction of beginning teachers could be attributed to so many factors as supervisory, administrative, organisational, financial, instructional, professional, institutional, operational, environmental and curricular. In fact the diverse socio-cultural background of the students, the school environments and the nature of activities they engage in should also be regarded as factors that could affect effectiveness of the beginning teachers.

The genesis of this problem could be traced back to 1979-1985 when the teaching profession was battling with a lot of ills and agony (Obasaju, 1983). For instance in Lagos State during 1979/1980 school year many schools were established resulting in the dilution of the existing pool of trained and experienced teachers. The rapid expansion of schools and population explosion of students resulted in the need for more teachers in quantity and not necessarily in quality. This encouraged all sorts of people into teaching (Afe, 1995). There was dearth of experienced teachers to supervise the new entrants as those available were few and scattered, if not lost from the classroom to responsibility posts.

The problem was further compounded when Universal Primary Education Scheme (UPE) became compulsory nationwide in 1979. This led to further explosion of population of both students and new teachers. Again experience did not increase as

the qualitative composition of the teaching force became questionable as new entrants were trained under the crash programme. Also during this time automatic promotion was practised in the primary school resulting in poor quality of students in the secondary schools. It was also during this period that the teaching profession suffered high attrition as a result of the new teachers regarding teaching as a stepping stone to improve oneself for other more lucrative professions. They were leaving in droves in many cases due to lack of support and crave for greener pastures with better remuneration. Again the baffling increases in school enrolments in both primary and secondary schools were not supported with adequate facilities and fund.

Another complicating issue then was the fact that the permanent secretary and commissioner for education at the state and federal levels respectively were politicians who were custodians of the party's educational policies (Obasaju, 1983). The result was that the appointment and allocation of functions were hardly based on merit and professional competence. It was almost always political. The attendant problem of poor supervision of beginning teachers due to few experienced teachers in the field inherited from the period stated above is still in the school system today. Evidence abounds that schools with experienced and qualified teachers usually do better than those schools with inexperienced, unstable and poorly qualified teachers (Fagbamiye, 1981; Ozoro, 1977; Baiyelo and Oke, 1998; Oyanna, 1979; Oke, 1990)

Therefore as a result of mass education leading to explosion in population of students and beginning teachers and the fact that the experienced ones to supervise the new entrants are few and scattered, the need then arises to explore and modify the apprenticeship system of the 1920's to 1950's (since it was an effective and successful supervisory method then) as well as look into a modification of a recent strategy in some developed countries to ensure teacher's support and retention.

Under the apprenticeship system of the 1920s to 1950s children of converted village heads in both Western and Eastern parts of the country lived, with the missionaries and were taught to become pupil-teachers and catechists. This system emphasised on -the -job training under the watchful eyes of the master teacher cum pastor. These pupil- teachers served under the master teachers for two years after which they sat and passed the pupil-teacher examination before they were qualified for a two-year teacher education training course to become certificated teachers.

The apprenticeship system can be favourably compared with the recent strategy employed by some developed countries where new teacher are assisted by mentors (experienced teachers) who demonstrate teaching techniques, observe new teacher's classroom teaching, provide feedback and hold support meetings to clarify issues (Walters and Wyatt 1985). The mentor views the new teacher as an intern to be helped in translating theories he learnt during the pre-service training into practice. In fact the mentor serves as a sort of cushion for the reality shock the

beginning teacher is likely to experience on exposure to authentic classroom situation.

It may thus be worthwhile to investigate the Teacher Mentoring Programme (TMP), which is the modified form of both the apprenticeship system of the 1920's to 1950's and the modern supervisory strategy employed in some developed countries as a guide in fostering optimal teaching competence of beginning teachers in Nigeria, with emphases on the sciences.

1.1.1 Teaching Competence:

Competence traditionally means capacity to achieve (Carr, 1993:253-271). Some form of this is what all teaching or training must aim to promote, insisting that what counts in teaching or training is what the learner becomes or is able to do, not necessarily what the course has covered. This is surely of great importance, because all teaching aims to promote learning, even if it doesn't always succeed.

Department For Education (1992) defined teaching competence as theoretical and practical teaching capabilities. Teaching is further defined as a purposeful interaction to promote learning which is referred to as changes in the learner's knowledge due to experience (Mayer, 1987).

Department For Education, DFE (1993) stated that a clear idea of teaching competence for beginners could give them an overall view of the nature of the professional role to which they aspire, as well as forming a basis for active planning and organisation of their own learning.

Since the late sixties in America, a new approach to teacher education called competence-based teacher education (CBTE) had been developed and offers promise to improve teacher education. Tuxworth (1989) and Wolf (1994) argue that a person's performance flows from their competence and that performance is a synonym for competence. So, paradoxically, competence-based education can be called performance-based education. The focus is on the behaviours a person could show after taking a course (that they couldn't before hand).

Jessup (1991:25) opined that in specifying a capacity or element of competence for instance, it requires a statement of what the (competent) person can do, together with a set of performance criteria which indicate aspects or sub-functions of what is involved.

Jessup stated further that the open-complex nature of teaching skills means that there can be a variety of valid formulations of teaching competence referred to as profiles. A competent teacher therefore, will be capable of a repertoire of strategies and will know how to select from them.

Thus a school-based system will definitely profit from having a teaching competence profile which allows for the specification of teaching strategies and tactics, but there may be particular emphasis on certain types of teaching strategy within particular subject areas.

The CBTE program specifies three types of Teacher competence that can be measured as follows:

(1) teacher knowledge:- facts, principles, generalisations, awareness, and sensitivities that the teacher is expected to acquire and demonstrate,

(2) teacher performance:- behaviour that the teacher is expected to demonstrate that is believed to help foster desired outcomes in learners,

(3) teacher consequences:- outcomes that the teacher is expected to bring about in the pupils' emotional and intellectual growth.

The aforementioned has made competence expected of a teacher explicit and easier to hold him accountable for meeting them (competence). Thus by specifying the knowledge, performance, and competence expected of the beginning teachers, learning experiences can be specifically designed to help the beginners acquire and demonstrate the competence.

1.1.2 Mentoring:

The term, "Mentoring", is very old, dating back to the Greek myth of Homer's Odyssey. It was not used systematically in the business world until the 1970s when it became associated with the apprentice model of education, when the more experienced craftpersons passed on their knowledge and skills to the novice – a close relationship often being formed between mentor and protege. Realising the organisational value of mentoring, companies have now started to formalise the

process as a means of preparing beginners for a post assisting their professional development. In business and industry, this normally involves a hierarchical relationship with a senior executive mentoring a more junior person.

Mentoring frequently takes the form of coaching-"this is the way we do things round here"- and acts as a way of introducing the person to the organisational culture. Clutterbuck, (1992) sees mentoring as an effective strategy for management development by companies. Similarly, Mc Call (1988) found that many of the key events in the careers of executives featured a specific person, usually the person's boss, although these were not long-term mentoring relationships.

Mentoring as a process has also been extended to educational institutions of developed countries apart from the industrial sector. According to Walters and Wyatt (1985), the American school system shows the beginning teachers being assisted by mentors who demonstrate teaching competence, provide feedback, and hold support meetings to clarify issues. The mentor views the beginning teacher as an intern to be helped in translating theories learnt during his pre-service training into practice.

Walter and Wyatt's views of mentoring is further corroborated by that of Leister and Johnson's (1981:32-46) study which stated that " mentoring is a one-to-one learning relationship between an older person and a younger [on the job] that is based on modeling behaviour and extended dialogue between them".

Again Moore and Amey's (1988:22-24) define mentoring as a form of professional socialisation whereby a more experienced (usually older) individual acts as a guide, role model, teacher and patron of a less experienced (often younger) protege.

The main aim of the relationship is the further development of the protege's skill, abilities and understanding.

1.2 The Problem:

Studies of Borko, [1987:270]; Corcoran, [1981:19-23]; Radford, [1993:52]; Veeman, [1984:143-178] revealed that the first year teaching experiences is full of demands, stresses, uncertainties and the tendency of beginners to slip into rigid patterns in an effort to gain mastery over students and subject-matter materials.

In most Nigerian secondary schools, it is a common practice that the new science teacher is introduced to his Head of Department and is left alone thereafter. The Head of Department only inspects the notes of lesson and rarely finds out the problems being encountered by the teacher in his classroom or whether he carries out the activities stated in the notes of lesson. The new teacher in turn bottles up his problems, fears and solved his problem his own ways whether professionally right or not.

It is therefore imperative to device a means of helping the beginning teacher assume roles and functions in a way that would reduce anxiety and cope with all forms of transition shock.

The performance on- the -job of the beginning teacher would be enhanced by introducing the Teacher Mentoring Programme (TMP) whereby the fresh teacher is attached to an experienced one who serves as a role-model, teacher, counsellor, motivator, sponsor and friend. The aim/objective of the TMP centres on mentors assisting the beginners "fine tune their instructional and classroom management skill" or "show them the ropes" (Veeman, 1984). This ensures that once on the job, beginning teachers have professional support throughout their induction years.

1.3 Purpose Of The Study

The purpose of this study is to:

(1) Examine the effects of Teacher Mentoring Programme on the Teaching Competence of Beginning secondary School Science teachers.

(2) determine whether factors such as qualification, length of experience, teacher support and gender affect the teaching competence of beginning teachers.

(3) identify the notable constraints to effective mentoring.

(4) propose, validate and trial test a mentoring programme to enhance teaching competence of beginning science teachers.

1.4 Assumptions:

The study is based upon a number of basic working assumptions which are herewith stated:

(a) that learning to teach does require thoughtful involvement in practical action within real school contexts and that teaching is of such complexity and subtlety that one never stops learning;

(b) that those who have any degree of teaching experience have considerable resources from which to help novice teachers get the most out of the important early parts of their teaching learning careers;

(c) that the beginning teacher must have acquired knowledge of subject matter to be taught more than the students.

1.5 Research Questions:

In this study, effort has been made to answer the following questions:

1. Does Teacher Mentoring Programme (TMP) have effect on the teaching competence of Beginning Teachers mentored?

2. Will Teacher Mentoring Programme (TMP) equally influence the teaching competence of professional and non-professional teachers mentored?

3. What are the notable constraints to effective mentoring and how can they be overcome?

4. Is a Teacher Mentoring Programme (TMP) as conceived also feasible?

5. What teacher type benefit most/least from TMP?

1.6 RESEARCH HYPOTHESES

For the purpose of facilitating decision making in crucial situations, the following null hypotheses were asserted and tested at 0.05 level of significance.

Ho_{1a} There will be no significant main effect of TMP on the teaching competence of Beginning Secondary School Science Teachers.

Ho_{1b} There will be no significant interaction effect of the variables on the teaching competence of Beginning Secondary School Science Teachers.

Ho_2 There will be no significant difference in the teaching competence of Professional and non-Professional Secondary School Science teachers involved in the mentoring programme.

Ho_3 There will be no significant difference in the teaching competence of beginning teachers involved in the TMP and those not involved.

Ho_4 The teaching competence of beginning teachers exposed to TMP will not vary by:

a) educational qualification

b) length of teaching experience

c) gender

1.7 Significance Of The Study:

Very little effort has been made in the area of providing beginning teacher with the needed professional support in their induction years. In this work, attempt is made to find out the extent to which adequate professional support affects the teaching competence of beginners. Apart from this, a teacher mentoring programme for beginning Secondary School Science Teachers is proposed which could help in enhancing their teaching competence.

It is hoped that findings from this study will provide some useful insight into how best to improve the performance of beginning secondary school science teachers and form the basis upon which concrete, relevant and practical suggestions could be offered to aid them.

It is envisaged that the proposed teacher mentoring programme used in this study would be incorporated into the pre-service and in-service training programme of secondary school science teachers to enhance their teaching competence.

It is also anticipated that the results from this study would provide curriculum developers, science teachers and policy makers with information concerning the types of competencies that should be acquired by science teacher trainers and practising teachers.

Finally, it is hoped that the findings from this study would aid other researchers on teacher mentoring in other subject area aside sciences as all beginning teachers will benefit from mentoring irrespective of area of specialisation.

1.8 Definition of Terms:

In view of the fact that same terms may be used in alternative ways which may lead to serious cross –purpose, the need arises to state operational definition of terms as related to this study.

Mentoring: The term is used in a relatively general way meaning assisting beginning teachers to learn how to teach in school-settings.

Mentor: is anyone involved more or less directly with the beginning teacher for mentoring purpose.

Teaching: is activity that teachers (whether officials or informal) do to promote action and experience whereby learners are likely to make such gains. Like most human actions, teaching is defined in this study by reference to its purpose and that is learning. An activity isn't a case of teaching just because it's done in a classroom or by a teacher. It's whether or not the action is in the service of

learning, directly or indirectly, and in a classroom or not. Thus teaching can be seen as a purposeful interaction to promote learning. Mayer (1987) defines learning as "changes in the learner's knowledge, where such changes are due to experience.

Beginning teachers: The study defined a beginning teacher as a teacher in the first or second year of teaching. The beginning teacher is also referred to occasionally as beginner, mentee, in this work. Similarly, it seems easier and clearer to stick to traditional terminology and refer to those who are taught by mentor teachers and beginning teachers as students, though sometimes school pupils or school students may be used.

Competence: refer to acquisition of theoretical and practical capabilities. Traditionally one would say that a person's performance flows from his competence. Thus performance is regarded a synonym for competence. The emphasis or focus will be on behaviours a person could exhibit after taking the course that they could not before-hand.

CHAPTER TWO

REVIEW OF THE LITERATURE

2.1 INTRODUCTION

An indepth review of literature materials for the study was carried out in this chapter under the following headings grouped into four sections.

SECTION A: Competence

1. Competence expected of Beginning Teachers.
2. Competence expected of secondary School Science Teachers.
3. Problems confronting Beginning Teachers.
4. The needs of Beginning Teachers.

SECTION B: Instructional Supervision

5. Concept of supervision
6. Supervision in Nigerian Schools.
7. Supervision at the Secondary School level.
8. Teacher Apprenticeship System Training.

SECTION C: Towards a Conceptualisation of Mentoring

9. Historical perspectives
10. Current concepts of mentoring
11. Studies on Teacher Mentoring Programme

SECTION D: Mentoring and Instructional Supervision

12. Effectiveness of Mentoring Compared to Traditional Supervision.
13. Mentoring as a refinement of Instructional Supervision

2.2 Competence expected of Beginning Teacher:

McGaghie, (1978) posited that competencies include a broad range of knowledge, attitudes and observable patterns of behaviour of the teacher which account for the ability to deliver a specified professional service.

Adegoke, (1989:36-42) and Department For Education, DFE, (1993) stated that a clear idea of teaching competence would actually enable pre-service teachers and beginners to relate theoretical knowledge to practical training and make them better prepared for life and their future integration into the working environment and the realities of their future occupational roles. Adegoke further stated the need for a competency-based curriculum model or what Tuxworth (1989) and Wolf (1994) referred to as teaching competence profile. The overarching question one seeks to answer is – What should one expect of beginning teachers in terms of their performance of the pre-active, interactive and post-active tasks of teaching? The three are the three domains of teacher tasks that appear to be important, regardless of the subject matter or grade level taught or the teaching-learning model employed (Joyce and Weil, 1986). The three domains of teacher tasks encompass functions teachers perform and are not bounded by time, that is, tasks may occur simultaneously or sequentially. Clark and Peterson (1986:255-296), for instance, stated that while teacher grade student papers [an interactive task], they may reflect on how the students' responses met or did not meet their expectations (a post active task). They may then use this information to plan the next day's

lesson (a pre-active task). Reynolds (1992) summed up the three domains and the general teaching tasks under each and are as follows:

Teaching task domains

i. **Pre-active task**

Comprehend content and materials Critique content, materials and teaching methods. Adapt content plans and materials, Prepare plans, materials and Physical space.

ii. **Inter-active tasks**

Implement and adjust plans during instruction, Organise and monitor students' time and materials during instruction and evaluate student learning.

iii. **Post-active tasks**

Reflect on one's own actions and students' responses in order to improve teaching, continue professional development and interact with colleagues.

The general teaching tasks transcend teaching contexts and the major difference context makes, is in the particular understanding teachers need to perform the tasks successfully, not in the tasks themselves. Understandings, therefore, comprise skills, abilities, knowledge and beliefs that are directly related to the execution of the task. Understandings refer to both the capacity teachers have to comprehend and what they actually comprehend (Schwab, 1978; Marks, 1990; Shulman, 1987).

In addition to understandings, according to Schechtman, (1989:243-248) teachers need certain personality characteristics to execute teaching tasks in a competent manner. Shechtman further stated that personality characteristics are those interests, temperaments, personality traits and moral/ethical standards that suggest what the teacher is likely to rather than how well he or she can do at peak performance. Some of these character traits include enthusiasm, warmth, supportiveness of students, sensitivity, interest in people, flexibility and self-confidence. Clark (1990) and Strike (1990:188-223) however argued that teachers should operate from moral ethical/standards that include honesty, intellectual freedom, equity, tolerance, due process, respect, trust and care.

Pre-active Teaching Tasks

Teacher planning extends over varying lengths of time, from the short range lesson (daily, weekly, unit) to the long range (term, yearly) and serves multiple purposes (Clark and Peterson, 1986:255-296). Studies of Anderson, (1986:104-112), Clark and Peterson (1986) posited that planning may be done to review the curriculum, to allocate instructional time for subject matter, individuals and groups of students, to ensure the availability of instructional support materials (eg. Textbooks, audiovisual aids, computer software) to study and review the content, to align curriculum content and objectives, instructional methods, strategies and assessments.

Evidence abound to show that novice and more experienced teachers planning differs. In general, beginning teacher planning is more time consuming than that

of expert teacher (Borko and Livingston, 1989; Livingston, McCaleb and Mauro, 1988; Housner and Griffey 1985; Ropo, 1987).

As Students achieve more and rate lesson higher when concepts, facts, principles and procedures are interrelated during the lesson (Smith, 1985; Van Patten, Chao, and Reigeluth, 1986), competent teachers, therefore, must know the subject matter in a way that allows them to create lessons that help students relate information to what they already know and that integrate instruction across content areas (Porter and Brophy, 1988:74-85). Such lessons engage students in activities that are suited to their current developmental and achievement levels, interests and needs (Brophy and Good, 1986; Porter and Brophy, 1988; Taylor and Valentine 1985). In other words, good lessons invite students to enter the learning process at their own level and then progress from there. This requires setting appropriate expectations that are both for instruction and social behaviour. For example students should be made aware of what work they are accountable for, how to get help when they need it, and what to do when they are finished with their assignments (Brophy and Good, 1986; Bielefeldt, 1988; Department of Education, 1987; Druian and Butler, 1987; Walker 1985). Expectations must neither be too low or too high so as not to induce students to disengage from school-based learning (Druian and Butler, 1987; Hohn 1986; Natriello, 1987). Competent teachers should be able to set appropriate expectations for themselves. This shows that teachers believe that they are effective and can affect the learning of students (Taylor and Valentine, 1985).

Competent teachers also make use of curricular materials that engage students' interests and that are appropriate for students' abilities and needs (Osborn, Jones and Stein, 1985; Taylor and Valentine, 1985). Porter and Brophy, (1988) opined that effective teachers make expert use of existing instructional materials in order to devote more time to practices that enrich and clarify the content.

Inter-active Teaching Tasks

Teachers actively engage with students and content when performing interactive tasks, in the teaching/learning process. The interactive decision making of effective teachers follows the findings of research on expert/novice differences and is postulated to involve rapid judgement thinking of information and differentiation of important from unimportant information (Clark and Peterson, 1986). Competent teachers see themselves more as managers of classroom life - that is, as persons who establish and maintain effective learning environments rather than as authority figures or disciplinarians (Brophy 1987). Also classroom of competent teachers are characterised by positive expressive qualities which include rapport, empathy, and personal interactions between teacher and students (Brophy and Good, 1986; Drucan and Butler, 1987; Stockard and Maybeny, 1985; Kounin, 1970). Cazden, (1986:434-463) stressed that competent teachers strive to understand the students in their classes in order to create and sustain a learning community.

Another characteristic common to competent teachers' classrooms according to Anderson (1986:104-112) and Emans and Milburn (1989:11-15) is the amount of time spent on instruction and learning. This is refered to as the Academic Learning time (ALT) in literature. There is little controversy over the finding that, when students spend more of their time engaged in the lesson, they learn more (Bennett, 1987; Brophy and Good, 1986; Conoley, 1988; Gettinger, 1986).

Competent teachers establish rules and routines by modeling and instructing for the desired behaviour. Brophy (1987) suggests that by instructing students in the rules and routines and reinforcing positive expectations and social labels, teachers can help students learn to control their own behaviour.

In general, to deal effectively with discipline problems competent teachers ignore minor distractions and instances of inattention and deal with potentially serious disruptions early by using eye contact, movement through the classroom or short questions or comments to the disruptive student (Taylor and Valentine 1985). They talk with the misbehaving student in private to minimise power struggle and face saving gestures (Brophy, 1987).

The lessons competent teachers implement have some common characteristics. The assigned tasks are of appropriate difficulty for students and are interesting or enjoyable. Task oriented behaviour is reinforced through frequent substantive interaction with the teacher. Feedback is also provided on the adequacy or

excellence of student task performance (Anderson, 1986; Coloney, 1988; Gettinger, 1986; Webb, 1985).

Post-active Teaching Tasks

Studies by Feiman-Nemser, 1991; Porter and Brophy, 1988; Schon, 1987; postulate that competent teachers reflect on their own teaching and students' responses in order to find out what was successful in order to refine their own teaching practices. This was corroborated by Taylor and Valentine (1985) that states that the competent teacher use multiple forms of assessment not only to evaluate students but also to find out the success of their teaching strategies. For example the teacher may ask a colleague to observe and then discuss the lesson afterwards. According to Borko and Livingston (1989:473-498), the distinguishing feature between expert and novice teachers is that the reflection of beginning teachers on their practice appear to be less focused than that of their experienced counterparts. The novices reflected concerns about their use of the chalkboard, clarity of explanations and examples and students' participation in the lesson. The veterans focused their reflection on student understanding of the material and on the events that they deemed noteworthy in the lesson.

In summary the competent teacher is one that is able to:

(a) plan lessons that enable students to relate new learning to prior understanding and experiences.

(b) Develop rapport and personal interactions with students.

(c) Establish and maintain rules and routines that are fair and appropriate to student.

(d) Arrange the physical and social conditions in the classroom in ways that are conducive to learning and that fit the academic task.

(e) Represent and present subject matter in ways that enable students to relate new learning to prior understanding and that help students develop metacognitive strategies.

(f) Assess student learning using a variety of measurement tools and adapt instruction according to the responses in order to improve their teaching.

Logan, Ellett and Nails, (1990) posited that the entrance of teachers with an inadequate knowledge base into the teaching-learning enterprise, that is, those that are unable to perform the pre-active, interactive and post-active tasks of teaching in a competent manner may place students at risk of educational failure. Teacher education and induction programme must be restructured to ensure that beginners have an adequate knowledge base before they take on full-time responsibility for students [Bartell, 1990; Lieberman, 1988; Logan, Ellett and Nails 1990].

2.2.1 Competence Expected of the Secondary School Science Teachers

Competency is the ability, or efficiency or capability required to carry out a given task (Akintunji, 1989). For the science teachers it involves having sufficient skills, knowledge and attitude to carry out a task whether pre-active, interactive or post-

active. The Commission on Science Education of the American Association for the Advancement of Science (1970) identified 31 competencies needed by Science Teachers and classified them into five categories: scientific inquiry, attitude toward science, processes of science, scientific knowledge and continuous learning. Many science education researches, (Smith and Cooper, 1967; Victor, 1972; Butts, 1969; Odunusi, 1984; 1986; James, 1971), indicated a strong relationship between teacher attitude and competence.

The general competencies expected of a teacher also apply to the science teacher. However, some science education researchers such as Okatachi, 1983; Nzewi, 1986; Odunusi, 1981; Chiapeta and Collette, 1978; Onyike, 1977; Markie and Capie, 1975; went further to actually identify the competence needed for effective science teaching that Nzewi (1986:48-53) grouped into seven categories to form a competency profile.

The competency profile is listed as follows:

Competency profile for effective secondary school science teaching.

1. **Planning Instruction in science (pre-active)**

    1. Break down a science course into scheme of work.
    2. Divide scheme of work into daily lesson topics.
    3. Possess knowledge of objectives of teaching science.
    4. Formulate instructional objectives to indicate learning, behaviour expected of pupils after instruction.
    5. Demonstrate sound knowledge of science subject matter.

6. Plan teaching activities to fit into the entire school plan.

7. Organise science course to meet varied instructional objectives.

8. Relate with other teachers of science.

2. Implementing instruction in science (interactive)

9. Communicate with pupils by giving clear explicit directions and explanations.

10. Plan and perform class demonstrations.

11. Relate scientific ideas taught in the classroom to the daily experiences of the pupils.

12. Initiate activities.

13. Work with small groups.

14. Help pupils acquire manipulative skills.

15. Provide a classroom atmosphere in which a variety of individual experiences can occur.

3. Evaluating Instruction in Science (Interactive)

16. Construct valid and reliable tests to evaluate pupils progress in science.

17. Use test result to improve teaching and learning.

18. Develop and use questions at recall of knowledge as well as application and reasoning levels.

19. Use a variety of evaluation devices and procedures e.g. tests, assignments and projects.

20. Report clearly pupils' progress to parents.

21. Act as a counsellor to improve individual pupils achievement in science.

4. **Using Instruction Material (Interactive)**

22. Select science materials and equipment necessary for science teaching.

23. Use instructional materials appropriate to the achievement for stated objectives.

24. Use available educational resources of the community for instructional purposes.

25. Improvise instructional materials suitable for science teaching.

5. **Maintain discipline (post-active)**

26. Identify causes of undesirable behaviours and provide help for change

27. Apply corrective measures to enhance discipline.

28. Ensure that any corrective measure fits both offence and offender.

6. **Reinforce learning (postactive)**

29. Arouse the pupils interest in science.

30. Motivate pupils by projecting an enthusiastic attitude to science.

The 30 identified competence cut across all levels of education. The studies of Borko and Livingston (1989), Porter and Brophy (1988) had found out that the

beginning science teachers have priority needs for assistance in planning and implementing instruction. This should create concern because if the science teachers were not highly competent in these areas one wonders what science they would be able to teach. Butts (1973) considering the above problem argued for a review of the teacher training programme pre-service teachers are exposed to and the need for massive in-service training of serving teachers.

2.2.2 Problems Confronting Beginning Teachers

The beginning teachers are faced with myriad of problems on instruction and curriculum which span the planning of their lessons through implementation (teaching on the classroom floor) to evaluate the subject matter taught.

Beginning teacher and more experienced teachers' planning differs. Clark and Peterson (1987) found that experienced teachers report only a modest-to-insignificant role of lesson planning in their everyday lives and seem not to use a linear rational planning model. The beginning teachers on the other hand might need a linear model (Tyler, 1949) to structure their planning until they develop a planning style that is compatible with their characteristics and teaching context. Livingstone and Broko (1989) proposed that beginning teachers would develop teaching expertise more quickly if given fewer preparations because they would have more opportunities to teach the same content.

The beginning teachers often found it difficult to make expert use of existing instructional materials in order to devote more time to practice that enrich and clarify the content (Osborn and Sein, 1985). The above findings was corroborated

by the study of Porter and Brophy (1988:74-85) which revealed that beginning teachers' inability to make expert use of instructional materials results in failure to tailor curricular materials to the needs of the students.

It has also been discovered that beginning teachers have trouble looking at the larger scope and sequence of topics within the textbook whereas experienced teachers can make sense of individual topics drawing on their past encounters with students (Schram, Feiman-Nemser and Bill, 1989).

Another practice that makes teaching difficult for beginning teacher is assignment to an academic area in which they are not well prepared (Hawk, 1994; Huling-Austin, 1986). In some cases beginning teachers who appear qualified on paper have minimal preparation. For example a life science teacher assigned to teach earth science. In such cases teachers will lack pedagogical knowledge i.e. ability to conceptualise the subject matter as a series of learning events or classroom activities for which a firm grasp of subject matter is a prerequisite.

Paine (1989) posited that beginning teachers take into consideration students' prior knowledge of the subject matter and their prior academic performance less often, than do experienced teachers, who realise that knowledge of students' differences influence the teacher's instructional planning and subsequent implementation of those plans. Teachers may see students as having individual differences which are psychological and biological differences, categorical differences which group students according to gender, social class, race and so forth without attention to the

social construction of the category, contextual differences which take into consideration the socially constructed causes of difference and pedagogical perspectives which recognise the pedagogical implications of student diversity. The beginning teachers' views of student differences are often idealistic and more coherent in abstract than concrete situational terms. Their (beginning teachers) perspectives are chiefly of the individual difference type and to a lesser extent, the categorical difference. Consequently they tend to see students differences as decontextualised and chiefly of the individual difference type and to lesser extent, the categorical difference. They see students' differences as decontextualised, which makes them ensure of how to concretise the abstract notions of fairness and equality in teaching. Thus they suggest teaching methods that treat diversity as a phenomenon. In short, these teachers bring approaches to diversity that have potential for reproducing inequality, reflect larger social historical dilemmas.

Despite beginning teachers' general belief that they will not have problems in managing, instructing, and developing interpersonal relationships (Weinstein 1988, 1989:31-40) they do have concerns about establishing general managerial routines, such as, classroom organisation and discipline (Amarel and Feiman-Nemser, 1988, Veeman 1984). They are also prone to unrealistic optimism establishing social relationships with students and other teachers and creating contexts that support their own professional development (Hollingsworth, 1990).

The study of Veeman, (1984:143-178) showed that beginning teachers do have problems in the area of student discipline and understanding classroom life.

According to Brophy (1987) the beginning teachers see themselves more as authority figures or disciplinarians rather than managers of classroom-life that is, as persons who establish and maintain effective learning environments. For example Pinneger (1989) found that beginning teachers in science say it is important to know which students are likely to impede progress, but they are not able to seek out information about students that would help them deal with problem students. Experienced teachers think often about students who "could not" and "would not" do the work; they have a repertoire of strategies to engage students in work.

Beginning teachers also appears to have difficulty making sense of classroom life (Bents and Bents 1998; Carter et-al, 1987; Hollignsworth, 1989; Peterson and Comeaux, 1987; Sabers, Cushing and Berliner, 1991). Recent investigations by Sabers, Cushing and Berliner of novice, advanced beginner, and expert science teachers illustrate this point. Novices had had no pedagogical course work but were science subject-matter experts who were interested in teaching; advanced beginners student teachers or first year science teachers with the reputation of having potential to develop into excellent teachers; and experts were junior or senior high school and science teachers who were nominated for teaching excellence and then observed by the research team and rated to be excellent. Findings suggest that novices and advanced beginners seem unable to discriminate between important and unimportant stimuli when viewing video taped classroom scenes.

In other words, they are less able to make meaning out of a given situation than are experts. The experiences that experts bring to the classroom setting seem to aid them in understanding what is going on. Novices also lack understanding of what teachers do to make a lesson effective. As Sabers, Cushing and Berliner point out, novices "apparently regard content, equipment and materials as the keys to success". Advanced beginners are able to recognise pedagogical methods, such as lecture, but seem to assign undue significance to the instructional materials used.

In general, experts are able to

(a) monitor and comprehend the events presented

(b) interpret the instructional strategies used,

(c) hypothesise reasons for behaviour seen and

(d) offer solution strategies for problems identified".

Novices seem to lack the mental schemata for thinking holistically about teaching. Advanced beginners (student teachers or first-year teachers), on the other hand, come closer to the experts' understanding of classrooms.

Beginning teachers do not demonstrate consistency in their instructional routines. Leinhardt & Greeno (1986:75-95) extensive observation of beginning teachers revealed that they have no repetitive pattern to their actions unlike the experienced teachers who were more consistent in their instructional routines.

One of the ways teachers evaluate student performances is through instructional monitoring. Brophy and Porter (1988) survey elicited beginning teachers' deficiency in maintaining consistent accountability procedures of all students progress with interventions to improve student learning. During instructional monitoring beginning teachers were found to be confused about their expectations, formats and other aspects of direction giving and how to hold students accountable for their work.

Experienced teachers evaluate their own teaching effectiveness by reflecting on their own actions and student responses in order to improve their practice. The beginning teachers do reflect on their practice but their reflections appear to be less focused than the experienced teachers.

As far as the beginning teacher is concerned everything is important and worthy of comment (Ferguson, 1989:36-41). Thus the beginning teachers have difficulty zeroing in on what is instructionally important for reflections because they have not developed schemata for organizing the enormous quantities of information gathered during classroom experiences.

Apart from having problems with planning, implementation and evaluation of instruction, the beginning teacher is also faced with other forces that influence the construction of his professional role. The main one is the reality shock he is bound to face tied to elements such as personality, ideals, environment, and role construction.

The reality shock

On completion of his studies, many a young teacher starts his professional career full of ideals. At the beginning of his career ideals such as acting democratically and trying to keep in touch with the experiences of pupils are important to the young teacher (Muller-Fohlbrodt, 1978). This idealing is often times generally mingled with some fear of the unknown teaching situation. A teacher who initially has no worries may pass through various stages of concern. Thus one can say that teachers cannot begin to think about the teaching situation and the pupils until they have conquered their own fears and are no longer concerned about self preservation (Fuller and Brown, 1975:25-52).

Muller-Fohbrodt (1973) mentions that the first emotional experiences in the teaching situation make many beginning teachers depressive and irritable. These experiences make the neophyte teachers worry about whether they will ever make good teachers. The concern and experiences are what is referred to as "Praxisschock' in German literature (e.g. Muller-Fohlbrodt, 1978; Hinsch, 1979). The English refer to this as the reality shock.

Kuntz (1973) study revealed that this reality shock is much more apparent with teachers than with graduates who make a career in, for instance, industry. Several investigations confirm the existence of reality shock (Muller-Fohlbrodt, 1978; Hinsch, 1979; Iberer, 1974; Koch, 1978; Oke, 1996;1998). The existence of reality shock can easily be proved by observing the change of attitudes in young teachers. Muller-Fohlbrodt and Hinsch found that it becomes much more progressive during

teacher training; but when new teachers start their professional career their attitudes become much more conservative.

Vagroep natuurkunde-didaktiek, (1978) study among 240 beginning physics teacher found that 60% of the teachers were not very satisfied with the lessons they taught. The most difficult problems were how to build up a good relationship with their pupils.

The teachers agreed that their known behaviour irks their pupils. The teachers agreed that their own behaviour had become more authoritarian. If they could make a new start they would act in act in a stricter manner.

A Dutch study by Olgers and Riesenkamp (1979) found that after one-half years of practice, new teachers have aligned their views with those of many of their colleagues in the school. Then they have lost much of their willingness to accept innovations. Vagroep natuurkkunde-didaktiek (1980) study showed that 60% of the beginning teachers faced severe problems in maintaining discipline. Some of the factors adduced for the change of attitude are; the gap between school practice and theories taught at the teacher training institutes and the more conservative attitude of experienced teachers in school (Muller-Fohlbrodt, 1978).

Personality:

The interpersonal behaviour that suits a teacher best in his relationship with pupils depends very much upon his personality (Combs 1974; Leary, 1957). Research results found this to be true not only with regard to the teacher's behaviour in lessons but with regard to all his behaviour. Leary stated that a teacher who finds it easy to manage other people finds it easy to use teaching methods like lecturing and classroom discussion where he plays a central role, whereas a teacher who is a more modest person is more successful when pupils work in groups or independently. The teacher can then help the pupils individually. The former type of teacher will more readily use the styles that Galton and Eggleston (1979) call informing and problem-solving and the latter type of teacher will more readily use the enquiring style. A teacher who displays many varieties of a certain type of behaviour outside the classroom, in situations in which he feels safe, often is able to use this type of behaviour inside the classroom as well.

If in the classroom, when he feels unsafe, a teacher tries to use behaviour which he finds very difficult to adopt, then he is likely to behave in a stereotyped and forced manner. This behaviour usually is not adequate to meet the classroom situation. It is important that the teacher be himself in the classroom. This means that the young teacher will have to act in a way that suits his character adopting the behaviour that comes to him most easily. Moreover he will perhaps have to broaden his behaviour repertoire in accordance with his capacities and his personality. Interpersonal skills such as judging, stimulating, guiding, entering into

pupils' thoughts, forbidding, showing respect, giving pupils ample scope, are all essential tools of the teacher's trade (Wubbels et al 1982:149-160)

Ideals:

A person who starts teaching has been in the position of a learner for almost twenty years. Thus a new teacher in his first lessons, has little difficulty in identifying himself with the pupils. It is difficult for him to feel like a teacher. A new teacher is inclined to think that many of the experienced teachers who are regarded as very good by their colleagues and pupils are in fact poor teachers. The thoughts of new teachers are very much influenced by the way in which they experienced their own education. Matters such as acting democratically and taking personal responsibility are of great importance to them and they dislike authority and the standard methods of maintaining discipline. That is why they very often cherish the ideal of having a relationship with pupils that is based upon equality and kindly under standing. For many people there is a relationship between ideals and personality, they cherish ideals that are partly realisable in the light of the capacities that are linked with their personality.

Environment:

The behaviour of a teacher is affected not only by his personality and his ideals but also by factors in his environment, such as the subject being taught, the number of pupils in his classes, the time-table etc. Other important factors affecting the teacher are the expectations of what Sullivan (1953:16-20) call significant others such as his colleagues, the pupils and the Head of the School. These people all

have different expectations. Colleagues for instance expect the new teacher to behave in stricter and more authoritarian manner than pupils expect.

Role Construction:

The role of the beginning teacher is gradually constructed under the influence of the expectations of others, his own personality and it is this role which ultimately defines his classroom behaviour (Figure 2.1)

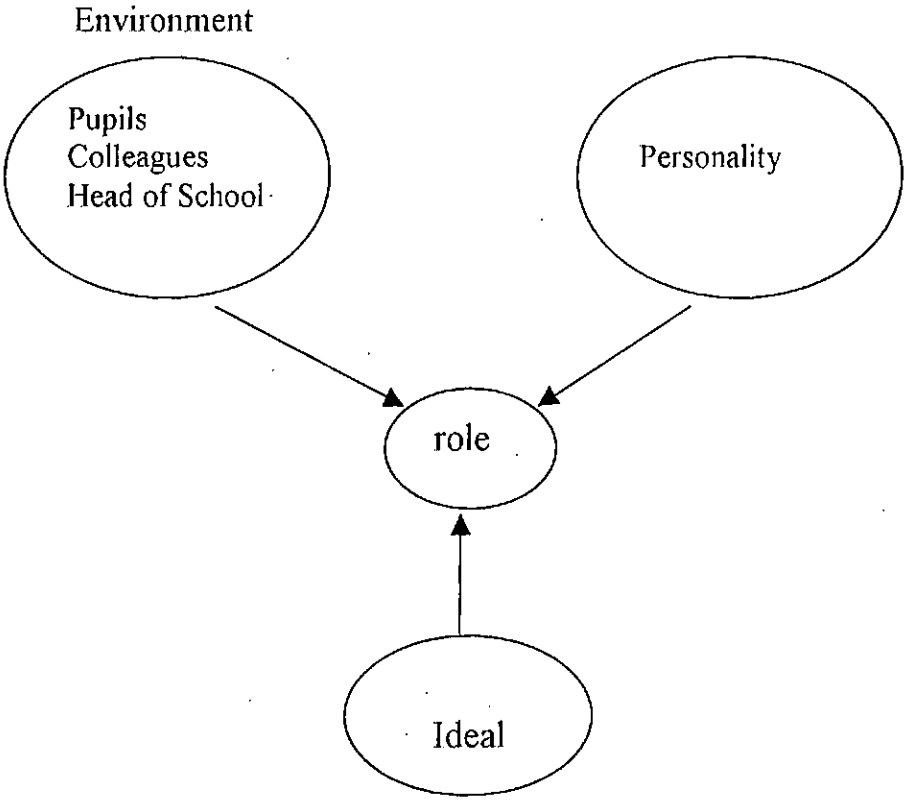


Figure 2.1: Role Construction.
Source: Wubbles, Creton, Hoomayers and Holvast (1982)

The beginning teacher will have to find a balance between the wishes and expectations of others and his own capacities. He will have to create his own professional role as a teacher. The professional role will be a compromise between the demands of others and his own feelings and needs (Buckley, 1968). Very often his own wishes have little in common with the expectations of colleagues and

pupils. Furthermore, according to Wubbels, Creton, Hoomayers and Holvast (1982:149-160), the beginning teacher often does not have the personal capacities (especially as far as interpersonal behaviour is concerned) required to mould his ideals into concrete behaviour; there is an ambivalence in the neophyte himself because his ideals and personality make different demands on him. Finally he has to cope with the different expectations of his colleagues, the school head and the pupils.

Buckley (1968) suggested that as a result of being pulled in so many directions and as a result of not being able to behave adequately, the beginner may feel very uncertain about his role. These feelings can cause severe stress. Wubbels is of the opinion that the stress the beginner experience in finding his role is one of the main reasons for the occurrence of reality shock. The shock arises because the beginner is confronted not only with the difference between his own wishes and the expectations of his colleagues, but he also becomes aware of his own inability to mould his ideals and wishes into concrete behaviour. Very often the beginning teachers try to survive by adopting teaching methods such as lecturing, whereby the class can be handled more centrally.

This change in behaviour will often be accompanied by a change in attitude. Ideals such as treating pupils as peers are abandoned and the young teacher becomes more conservative. The school structure and school climate also have a marked influence on the behaviour and attitude of the young teacher. Wubbels et-al (1982)

finally suggested a very active pre-service and in-service training period to help the beginner preserve his ideals.

2.3 The Needs of Beginning Teachers:

Several major studies have been conducted on the needs of beginning teachers (e.g. Hoffman, Griffin, Paulissen, O'neal and Barnes, 1985; Brooks, 1987;Oke, 1997).

These researchers point out that the first year, is the critical year of teaching, often determining whether a person will stay in teaching and what kind of teacher the person will become.

Feiman-Nemser, 1983; Borko, 1986; Mclaughlin, 1986; Schlenhty and Vance, 1983; estimate that 15% of the new teachers leave after their first year of teaching and an additional 25% will leave by the end of their third year.

Among the prime reasons for the exodus according to Hauling-Austin, (1987) and Rosenholts (1983:421-439) are isolation, lack of appropriate support and poor working conditions. Another reason so many teachers leave is that teaching as a profession has been slow to develop a systematic way to induct beginners gradually into the complexities of a job that demands hundreds of management decisions everyday. Terms like intern and trainee are used in other profession to identify a beginner who has received training in the profession and who earns a stipend by participating in limited experiences under expert supervision. In the teaching profession, these terms are often used differently. Interns and trainees

have full teaching responsibilities and often have limited expert supervision. (Shulman and Colbert 1988; Oke, 1998).

The need then arises to develop a more gradual method of induction into teaching within a supportive and collaborative environment in ways that engender self esteem, competence, collegiality and professional stature (Borko, 1986; Gehrke, 1987; Joyce and Showers, 1980; Rodriguez and Johnstone, 1986)

The needs of the beginning teachers can be met by reflecting coaching on the part of the mentor. If mentors are to help beginners achieve worthwhile professional learning, they need to assist them to adopt the forms of reflective stance proposed by Schon (1987). Mentoring, like teaching involve a continual reflective cycle which include:

(a) Planning the teaching on the basis of clear understanding of aims and context and appropriate selection of strategies.

(b) Engaging in the teaching activity, whilst

(c) Monitoring that actions and its effects

(d) Feeding back information from this monitoring into reflection and replanning of the teaching or particular sub-aspects of it.

All the aspects according to Schon could be combined in repeated plan-teach-reflect cycles relating to units such as whole lessons or syllabus topics. The plan-teach-reflect cycle could be broken down into:

(a) Assisting planning by contributing to pedagogical understanding and grasp of a repertoire of teaching strategies.

(b) Direct assistance and support for teaching activity.

(c) Assistance with monitoring of teaching activity and its effects.

(d) Assisting analysis and reflection both during and after the action.

(e) Taking account of skill acquisition phases

(f) Harnessing beginners motivation and commitment through interpersonal sensitivity and skill.

The whole cycle is diagrammatically represented below with the reflexive coaching functions indicated by the round bubbles connected by dashed lines to the cycle of beginners teaching phases.

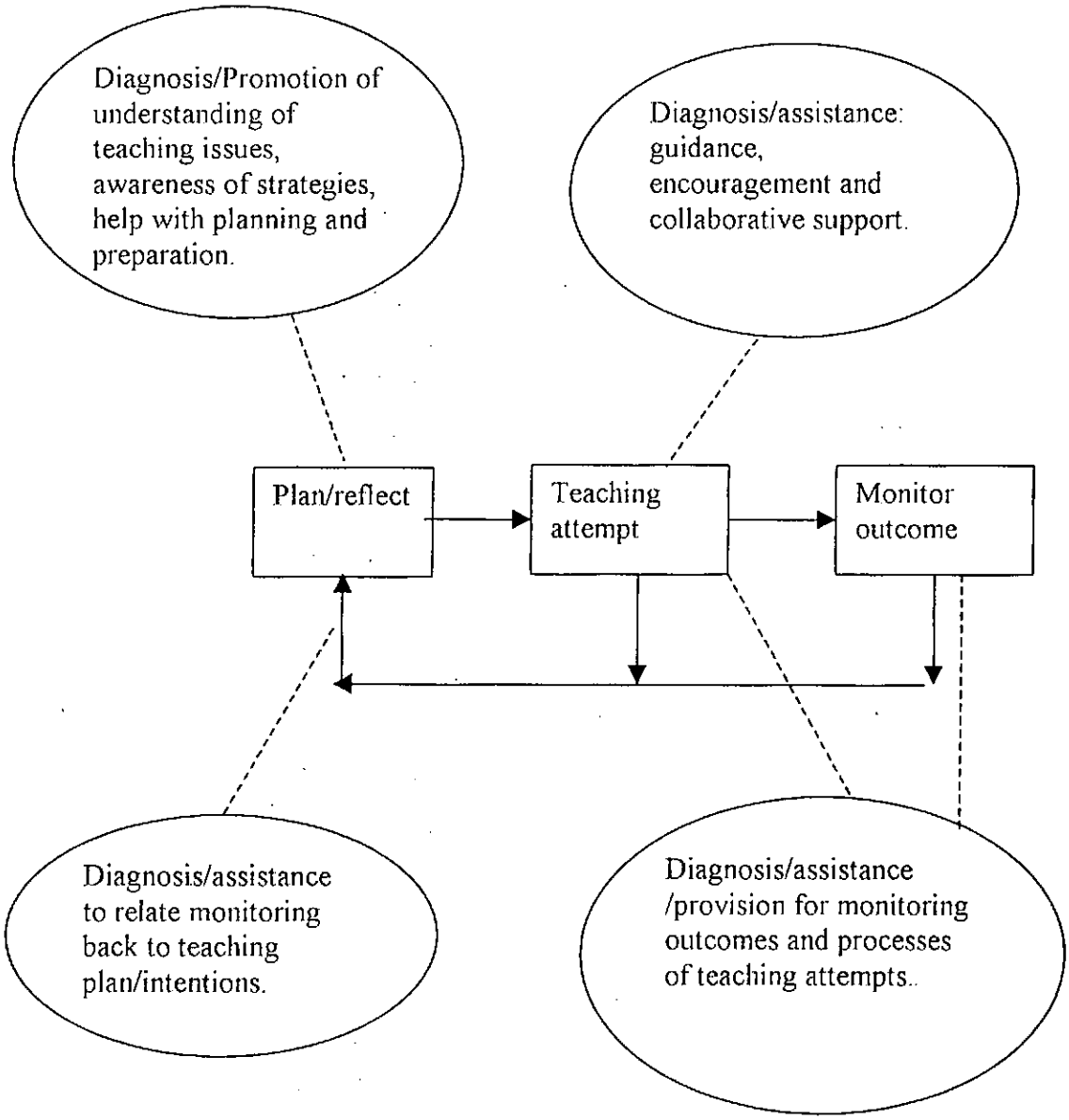


Figure 2.2 Reflective Coaching Functions in Relation to the teaching skill cycle.
Source: Tomlinson (1995)

The mentor's diagnosis is all the more necessary in so far as beginners find it difficult to monitor their own thinking and action in the early stages. The above cycle plus its coaching input function can of course be applied at any level of teaching action unit, from consideration of whole teaching periods at a time, through to focuses on particular within – lesson phases or actions such as transitions, to very specific events and interactions.

Reflective coaching raises the issue of what is effective in helping teachers develop new ways of teaching whether they are new or experienced. Bruce and Showers (1988) work on staff development corroborates this by showing that its (reflective coaching) effects on skill at implementing new teaching strategies increases as training programmes include more of the following: information provision, theory, demonstration, practice, feedback and coaching . it was notable, for instance, that training does not appear to assists into new situations until the training includes a least theory provision, plus demonstration, plus practice (Maynard and Furlong 1993).

Calderhead and Gates, 1993; Tomlison. 1995; revealed that in practice the basic coaching functions discussed above in meeting the beginner's needs might be collapsed into four basic forms of learning-teaching with corresponding mentor assistance namely:

(a) beginners learning from others teaching

(b) beginners learning through their own teaching attempts

(c) students learning through progressively collaborative teaching with others.

(d) Exploration of central ideas and broader issues.

These forms are summarised with their main components in Table 2.1

Table 2.1: Major Forms of beginner's learning activity and Mentoring.

1. Assisting interns to learn from others teaching by:
   (a) Unpacking the planning
   (b) Guiding observation of the action
   (c) Modelling and prompting monitoring
   (d) Modelling and prompting reflection.

2. Assisting interns to learn through their own teaching activities by :
   (a) Assisting planning
   (b) Supporting the teaching activity
   (c) Assisting monitoring and feedback
   (d) Assisting analysis and reflection.

3. Progressively collaborative teaching involving
   (a) Progressive joint planning
   (b) Teaching as a learning term
   (c) Mutual monitoring
   (d) Joint analysis and reflection.

4. Exploring central ideals and broader issues through
   (a) direct research on pupils, colleague, school and system contexts.
   (b) reading and other inputs on teaching and background issues.
   (c) organised discussion and tutorial work on these topics.

2.4 INSTRUCTIONAL SUPERVISION

2.4.1 Concept of Supervision

The basic function of supervision is to improve the learning situation for students. Hence if any person in supervisory position is not contributing more effective learning in the classroom, his existence in that position cannot be justified. Several definitions of 'supervision' have been given and there has been a general tendency to define educational supervision in the same terms as supervisions in the industry. Dickey (1969:24) says that "purpose of supervision is helping teachers to learn

what their problems are and to seek the best methods of solving them whether they be individual or group problems". Kinnezevich (1969:250) argues that "supervisory activities include in-service development, direction, control and stimulation of efforts towards goals, observation to determine when minor adjustments must be made in or doing plans and programmes and of progress and outcome". Direction, control, observation and appraisal are aspects of the supervisory responsibility of supervisors that cannot be shirked.

2.4.2 Supervision in Nigerian Schools:

Supervision in the Nigerian context assumes a different shape and direction. From earlier stated definition of supervision, supervisory attitudes in Nigerian schools are usually carried out by inspectors who are employees of the ministries of education. Their activities are limited to visiting schools and observing teachers at work. This type of supervision is somehow limited and not adequate enough as it is more of observation and evaluation. This can not serve satisfactorily as a valuable tool for remedial work among teachers.

In many Ministries of education in Nigeria of today, the inspectorate units are really non-functional and are in need of qualified and experienced personnel who can offer professional assistance and leadership to teachers in schools (Anise, 1978:17-21). One can then say that this traditional avenue for offering assistance to teachers is not available generally to Nigerian teachers. Needless to say that where it is available it induces fear in teachers and takes place only in context of evaluation.

These inspectors in the inspectorate are expected to check the standard of work in the schools and offer suggestions to the teacher for more effective work. They also examine the materials, equipment, buildings, grounds, discipline and administration of the schools. More often than not duties assigned to these officers are so many that they have very little time for visiting schools.

It is quite clear that the work of inspectors can not be compared to that of instructional supervisors. The inspectors are more like watch dogs of teachers and do not directly enhance the teachers professional growth and development. The inspector is seen as a master who was always eager to find fault with the headmaster and the school teachers. The need arises therefore for competent in-house instructional supervisors who would be seen as leaders interested in maximum utilisation of available resources to optimise teaching competence of the teacher and indirectly improve learning competence of the student.

2.4.3 Supervision at the school level:

The following diagram represents the typical structure of supervision at the school level:

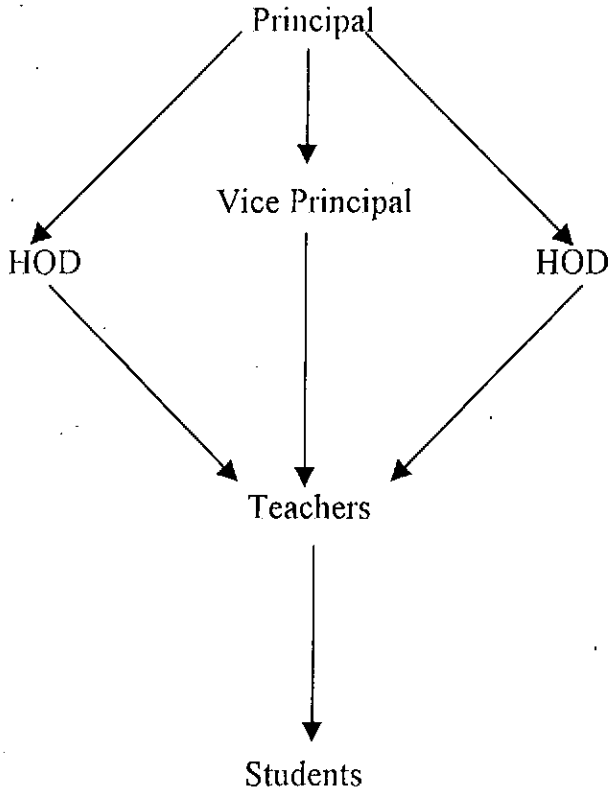


Figure 23: Structure of Supervision at School Level.

The Principal as a supervisor:

It has always been accepted that one of the various responsibilities of the principal is to ensure that effective teaching and effective learning are going on in his school. The principal in his own right is a foremost supervisor, who plays the roles of an administrative supervisor, an instructional supervisor and a subject supervisor. However, the modern approach to supervision has further increased the principal's responsibilities imposing on him the duties of planning, organising, co-ordinating, supervising, directing and controlling the quality of the various activities necessary to accomplish the goals of the organisation.

Evans (1974:77-85) asserted that principals who combined supervision with their administrative duties often encountered few disciplinary problems as opposed to non-supervising principal who stayed in the office most of the time. Society expects the principal to provide leadership for curriculum development and above all for instructional improvement. There is no doubt that Principals have so many administrative duties to tackle, it is however essential to ensure the precedence of instructional improvement over his managerial duties (Harrison, 1968:50).

Ogunsaju (1982) revealed that most principals often pay little or no attention to problems faced by beginning teachers. He further stated that beginning teachers need more supervisory help than experienced ones. In most cases the beginning teacher is left alone on trial and error, sink or swim experiment to solve his problem. Ogunsaju advocated for more supervisory time to be spent with the beginning teacher to help cushion the reality shock he is bound to experience.

Swearing-gen (1962:63-69) says that the classroom is the centre of instruction and therefore, principal should learn to direct much of his attention towards the classroom in order to be aware of what is happening there. The principal is expected to visit the classroom and observe teachers and students working together. He is also expected to put the teacher at ease by making him (teacher) realise that he is not out to criticise or judge but to help him improve his teaching techniques and capabilities.

A great portion of this task area may be assigned to the master teachers but the principal must be involved as it is through supervision that the principal knows about the performance of each teacher.

The Vice Principal:

The Vice Principal assists the principal in all his instructional and curricular duties, therefore the roles identified for the principal also apply to the vice principal. However, in a good administrative set-up, the duties are better shared. In most cases the Vice Principal prepares the time-table, organises and supervises external and internal examinations. He keeps records of staff daily attendance and teachers' attendance of classes. He also keeps records of staff movement book, lesson missed register and students attendance registers. The Vice Principal chairs the continuous assessment committee and writes reports on Heads of Departments. He also discharges other duties that may be assigned to him by the principal.

Head Of Department (HOD):

All teachers are grouped into departments on subject basis. Subject area heads are the heads of departments and are expected to be supervisors of the instructional activities of their departments. In most Nigerian Secondary Schools the heads of department see themselves more as administrative supervisors than instructional supervisors. Since heads of departments have been appointed largely on the bases of their subject specialisations they have a great responsibility in the administration of the instructional programme. They are expected to work very

closely with the principal in developing Curriculum for the school. National educational objectives are handed down by the Federal Ministry of Education.

The HOD is expected to work with the principal in generating objective for the school from the one at Federal and state level. The HOD is also expected to aid the teachers in his department in developing learning contents into units. It is the HOD who is responsible for compiling lists of needed books, laboratory materials, special equipment and other needed teaching aids. The HOD is expected to keep abreast of publications, new materials, current trends in his subject area. He ensures that the materials are acquired, distributed and used.

It is a task of the HOD as the instructional supervisor in his department to check lesson plan, the teaching and evaluation of his teachers. The practice of some HODs to just write 'seen' and append their signatures to lesson plan submitted by their teachers is deplorable. There is the need for the HODs to read the lesson plans thoroughly and offer suggestion if and when the need arises.

The HODs are also expected to look in occasionally in the classrooms of their teachers to see how actual teaching and learning are conducted. Unfortunately department heads are often selected, on the basis of seniority rather than on their competence as instructional leaders. Furthermore, departmental heads are usually concerned little, if at all, with the interactions between subjects. Indeed, the department head is frequently the leader and spearhead of inter-departmental rivalry, competition and clannishness. At times the principal forgets the

responsibilities presumably centred in the department heads. Consequently some teachers deal directly with him instead of through their department heads.

Another constrain encountered by the department heads that may affect their roles as instructional leaders is the failure of school management to provide them (HOD) with time for supervision and the tendency to limit drastically the activities and functions they may perform. In many schools the duties of department heads are chiefly administrative rather than supervisory in nature.

The Subject Supervisor (Subject Teacher):

The subject teacher in turn supervises learning by students. The subject teacher knows his students very well and therefore strives for the best available way of achieving his stated objectives. The subject teacher teaches the subjects he is employed for and any other subject(s) assigned to him from time to time.

He sets and marks examination questions, conducts tests and supervises projects at regular intervals, and to meet targets set by the school. The subject teacher is also expected to do the work of class teachers which include keeping of attendance registers, diaries, filling and updating of admission registers, preparing report cards and broad control sheets. The subject teacher belongs to and works in at least one of the School Committees.

The subject teacher should also belong to and attend meetings of subject associations at Local and State levels and arrange workshops and seminars as

desirable. He also writes and submits lesson notes on regular bases as well as giving remedial teaching and extension lessons as desirable.

2.5 Teacher Apprenticeship System Training

Solaru (1965) revealed that there were no formal training for early teachers. In fact Solaru recalled that the first set of professional teachers in Nigeria were the teacher/catechists or teacher/pastors usually employed by the missionaries. The curriculum was fashioned out from the Holy Bible while their reward was to be received in Heaven.

In those early days of teaching, especially the would-be teachers were trained using the apprenticeship system training. According to Fafunwa (1964), the apprenticeship system training involved children of converted village heads in both western and eastern part of the country who lived with the missionaries and were taught to become pupil-teachers and catechists. This system emphasised on-the-job training under the watchful eye of the master teacher cum pastor. These pupil-teachers served under the master teachers for two years after which they sat and passed the pupil-teacher examination before they are qualified for a two-year teacher training course to become certificated teachers.

The master teacher then recognised the fact that the pupil-teacher might find teaching traumatic (Probst, 1973:466-467). The veteran teacher/supervisor with a wealth of experience of the curriculum and teaching skills provided both

knowledge and encouragement needed by the inexperienced teacher during this most challenging period of his career.

Adequate and qualitative supervision by the master teachers helped in alleviating the initial problem of the pupil-teachers that were mainly loneliness and insecurity. Ogunsaju (1983) stated that the pupil teachers observed the master teachers in action. The master teacher in turn observed the teaching of the pupil teachers after which feedback and support meetings were held where the lessons taught were reviewed and suggestions were offered for further improvement of teaching competence of the pupil-teacher.

The apprenticeship system can be favourably compared with the recent strategy employed by some developed countries where new teachers are assisted by mentors (master teachers) who demonstrate teaching techniques observe new teacher's classroom teaching, provide feedback and hold support meetings to clarify issues (Walters and Wyatt, 1985). The mentor views the new teacher as an intern to be helped in translating theories he learnt during his pre-service training into practice.

The apprenticeship system of training of the 1920's to 1950's was an effective and successful supervisory method that worked then. It was however successful then due to small population of students. Therefore, it would have to be modified to fit into modern times with attendant problems of explosion in population of students

and new teachers coupled with the fact that the experienced teachers to supervise the new teachers are few and scattered.

2.6 Towards A Conceptualisation Of Mentoring

2.6.1 Historical Perspectives:

The term "Mentor" has been traced back to the Greek myth of Odysseus in Homer's epic poem, "The Odyssey". Odysseus a great royal warrior, in this myth, entrusted his son, Telemachus, to his friend, Mentor when he (Odysseus) went to fight in the Trojan war in far away Troy.

Mentor was charged with advising and guiding the entire household especially Telemachus in finding a new and fuller identity of his own. At times, in the myth, Athene, the Greek goddess of wisdom, craft and skilfulness, whether of the hands or the mind, appears to Telemachus in the form of Mentor.

The account of Mentor in "the Odyssey" leads to several conclusions about the activity that bears his name. First, Mentoring is an intentional process. Mentor intentionally carries out his responsibilities for Telemachus. Secondly, mentoring is a nurturing process, which fosters the growth and development of the protege toward full maturity, mentor was responsible for bringing out the full potential in Telemachus. Thirdly, mentoring is an unsightful process in which the protege acquires and applies the wisdom of the mentor, It was mentor's task to help Telemachus grow in wisdom without rebellion (Clawson, 1980:62). Fourth mentoring is a supportive, protective process. Mentor was to "keep all safe" and

Telemachus was to consider the advice of Mentor. Anderson and Shannon (1988:39) asserts that role modelling is a central quality of mentoring as shown by Athene's activities in the Odyssey. She provided Telemachus with a standard and style of behaviour which he could understand and follow.

A new English Dictionary, Murray (1908), documents various uses of the term mentor dating as far back as 1750. These uses confirm the historical meaning of mentoring and further imply that a mentor may be a person or a personified thing. It has not been until the last one and a half decades that much about mentoring has appeared in the professional literature (Clauson 1980). Eng (1986:124-131) suggests that this emphasis on mentoring coincided with the views of Human Resources Development Movement in business.

2.6.2 Current Concepts of Mentoring

Mentoring in the later years became associated with the apprentice model of Education and more in the field of business. Blackwell (1989) says "mentoring is a process by which persons of superior rank, special achievements and prestige instruct, counsel, guide and facilitate the intellectual and/or career development of persons identified as proteges".

Blackwell's view of mentoring is further corroborated by that of Leister and Johnson's (1981:69-82) study that stated that mentoring is a one-to -one learning relationship between an older person and a younger that is based on modelling

behaviour and extended dialogue between them". The aim of the relationship is the further development of the protege's skill, abilities and understanding".

Carger (1996) views mentoring as a human process in which one sees, reflected in a mentor, aspects of one's self, facets not clearly in focus, potentials not fully realised. Carger stated further that mentoring is an intimate process because it involves more than just modeling, it requires self- discovery as well. Carger is of the opinion that a bond forms when "kindred spirits" encounter one another and see beyond the surface to the substance. Thus mentoring, at its best, is just this type of " touching a life" of another, of sharing core value and encouraging one another. It is a serious business investing in the life and well-being of another, perhaps similar to the Hasidic vision that what one does to one person, he does to the generations that follow, echoing through time. Mentoring as a term has also been utilised in business organisations to cover such diverse images as teacher, coach, trainer, positive role model, developer of talent, opener of doors who permit their proteges to move up the organisational ladder on their coat tails.

Roche's (1979:24-28) survey of successful business leaders showed that executives who have had a mentor earn more money and are likely to follow a career plan and in turn sponsor more proteges than executives who have not had a mentor. Again Ferguson (198936-41) reported that managers who had a mentor compared to those who did not showed higher levels of job satisfaction and a higher promotion rate. Riley and Wrench (1985) found that women lawyer who had been mentored

perceived themselves as more satisfied and successful than those who had not been mentored.

In the school system of developed countries, the concept of mentoring rises on the horizon as educators think of new paradigms for novice and veteran teachers to adopt and work together. Mentoring process in the educational institution of these developed countries shows the beginning teachers according to Walters and Wyatt (1985:17-21) as being assisted by mentors who demonstrate teaching techniques, observe new teachers classroom teaching, provide feedback and hold support meetings to clarify issues. Veeman (1984:48) described new teacher transition into the classroom as involving "reality shock" and unanticipated "loneliness of the work place". The mentor is expected to serve as a sort of cushion for the reality shock and loneliness, the new teacher is likely to experience on exposure to authentic classroom situation.

Empirical links have been found between mentoring and academic success. Erkut and Mokros's (1984:15-22) report of a survey completed by 725 students at six different liberal Arts colleges, revealed that all respondents were able to identify a professor who had an impact on them by demonstrating the kinds of commitments, skills and qualities that they saw as important for themselves.

The above finding was supported by Pascarella, Terenzin and Hibel's (1978) study that examined the effect of six different types of faculty contact on academic activities of approximately five hundred students. The result showed a curvilinear

relationship between contact with faculty and academic achievement, such that the first few informal interaction with faculty appear to be the most important.

Heller and Sindelar (1991:52-57) study revealed the fact that mentoring benefits the beginning teacher, the mentor and the school. The beginning teacher's opportunities to exchange views with an experienced teacher is a distinct benefit to him/her. The mentor benefits from opportunity to share views, experience and strategies. The improved teaching that usually results is an asset to the school.

2.7 Studies on Teacher Mentoring Programme

In the developed countries especially the U.S.A the spread of mentoring programme became a national phenomenon by the end of the decade (Hawk and Robards, 1987; Huling-Austin, 1987).

2.7.1 The Connecticut Beginning Teacher Support and Assessment Programme (BTSAP)

The Connecticut Beginning Teachers Support and Assessment Programme (BTSAP) was implemented during the 1985/1986 academic year in five school district of U.S.A. A total of 20 teachers designated, Beginners were matched with 20 veteran teachers designated master teachers. The programme was designated to improve both the skills and the assessment of beginning teachers. The master teachers were to help the beginning teachers merge herself or himself into the new role of teacher in a way that could reduce anxiety, stresses, uncertainties, and the tendency of beginners to slip into rigid patterns in an effort to gain mastery over

students and subject matter material. Master teachers could help beginning teachers "fine tune their instructional skills and classroom management skills". The master teacher could do all the above by demonstrating observing and holding post-observation conference to provide feedback and offering suggestions for improvement. The study was concerned with the rates at which the beginning teachers reached and exceeded basic competence. The group of experience teachers provided a valuable source for comparisons.

2.7.2 The Innovative Beginning Teacher Induction Programme (TIP)

This was a two year analysis of classroom interactions of nineteen first-year teachers and twelve experienced teachers from South Central North Carolina in USA. (Schater, Springfield and wolfe 1986:15-21). The foundation of the programme was a research indicating that a variety of teacher behaviours across grade and subject affect student learning. The researchers argued that teachers should learn those behaviours and consequently, increase their students' achievement. These behaviours that have been shown to increase students' achievement in a variety of contexts include minimising disruptions and organising activities during academic times, increasing interactive instruction and the thoughtful use of questioning praise and other feedback. In all there were 51 such specific behaviour The programme incorporated clinical supervision, school-based support systems and information from collaboratively developed in-service projects.

In TIP, six trained observers used the Stalin Observation System (SOS) by Stallings (1980:11-16) to observe the 19 teachers during the fall and spring of their first and second year. The 12 experienced teachers were observed during the same time.

Three types of analysis were undertaken. The first, examined changes in TIP participants behaviour patterns over time repeated–measures. Analysis of Variance (ANOVA) were computed on the available second year teachers.

Comparisons were made between the TIP participants and experienced teachers in a separate Stallings' Effective Use of Time Program (EUTP) training, Case studies of TIP teachers were constructed from the extensive qualitative data collected from interviews and students' journals.

The results from the two-year observational data of the TIP teachers indicate that the teachers improved their teaching performance while involved in the programme. This change could merely be the result of the experience the teachers garnered in their first year of teaching or other influences, however Evertson (1985) conclusion that induction typically narrow teachers' range of instructional strategies suggests that the TIP programme positively influenced the inductees' behaviour. Although the lack of a control group of comparable beginning teachers who did not participate in the programme prevents one from attributing this possibility and calls for further study with matched inductee control.

Further, the data suggest that new teachers require time to develop the complex repertoires of behaviour necessary to succeed in classroom even when provided with unusual high levels of support and direct feedback. Experienced teachers in the study made marked changes in a variety of classroom behaviours within a single semester. First-year teachers in the study did not make such rapid adjustments as had been the case with first-year inductees in California (Ward & Tikunoff, 1989).

Similarly, the results showed that given support, a full year of teaching experience, structured opportunities for reflection during a second year of teaching, second-year inductees adopted more sophisticated instructional techniques.

2.7.3 Los Angeles Unified School District (LAUSD) Collaborative Model for a beginning teacher support system.

Yet another Teacher Mentoring Programme is the Los Angeles Unified School District (LAUSD) collaborative model for a beginning teacher support system (Colbert and Wolff 1990).

This was an elementary and a secondary beginning teacher retention programme collaboratively developed by the Los Angeles Unified School District (LAUSD) and California State University Dominguez Hills (CSUDH). The goal of the programme was to retain as many beginning teachers as possible in low socio-economic inner city classrooms characterised by high annual teacher attrition by developing and implementing a model for providing them with systematic support, assistance and reducing their feelings of isolation through co-operative team

planning. The two projects (elementary and secondary beginning Teacher retention programme) included over 120 beginning teachers and 24 lead teachers over a 3-year period.

The elementary project involved 69 beginning teachers made up to 31 credentialed and 38 emergency status teachers. The credentialed ones are the certificated teachers while the emergency status one were those earning a credentialed while teaching full time. They were referred to as interns and trainee respectively. The secondary project included 73 beginning teacher participants (13 credentialed and 60 emergency status). All of them were English, Mathematics, Science or social studies teachers in their first or second year of teaching and were not enrolled in another beginning teacher support programme. The lead teachers were experienced teachers with proven teaching excellence and leadership qualities and are perceived as nurturants and non-judgemental.

Teams of two to four beginning teachers and one lead teacher were formed at each school. The team met weekly for co-operative planning, problem-solving and assistance. A journal was kept documenting the date, time, duration and subject of these meetings which totaled a minimum of 60 hours in a year.

The lead teachers were trained in methods of classroom observation and coaching to provide the needed assistance and support. The beginning and lead teachers enrolled in university classes designed for programme participants and manned by project directors (faculty members). Six characteristics of the beginning teachers in

the programme were assessed – performance, collegiality, career satisfaction, retention, abilities to teach diverse students and need for special assistance. Four instruments were used in the evaluation and are:

(a) Academic learning time classroom observations measuring student engagement in academic tasks.

(b) Instructional practice ratings measuring teachers' use of practice that research has shown to be related to student achievement.

(c) New teacher expertness ratings that provided data on new teachers' development of a range of characteristics, skills, and knowledge exhibited by expert professional teachers.

(d) New teachers' analysis and reflection skills as evidenced in a telephone interview.

A comparison group of beginning teachers not involved in the project was assessed. Project participants at both elementary and secondary levels reported that the structured interaction between the lead and beginning teachers that occurred on a regular basis was the most important component of the project. They also reported that the university classes that were attended by beginning and lead teachers enabled them to work collaboratively to implement strategies in their classrooms that removed the feelings of isolation that many new teachers feel. The results of the project revealed that project beginning teachers used more effective

instructional planning practices, provided more learning opportunities for students and had higher student engagement rates than non-project participants. Again the project beginning teachers were more positive in their perception of teaching as a career than beginning teachers in similar schools who were not in support programmes. Finally the Southwest Regional Laboratory (SWRL) evaluators found the 89% of the project teachers are still in the same district, three years after the project. The evaluators also discovered that 10% had transferred to other districts while only 1% had left teaching.

2.7.4 The California Mentor Teacher Programme (CMTP)

In 1983-84 academic year, the Far West Laboratory (FWL) for Educational Research and Development conducted a comprehensive two-year study of first year implementation of the California Mentor Teacher Program. The study included two survey of all participating districts and 10 case studies of district. The research was guided by following questions that are the challenges and problems that mentor or master teachers face as they attempt to assist novice teachers: How does their new status affect the relationships that they have with administrators and other teachers? What guidance to policy makers and planners, both within the teaching profession and outside can be drawn from a careful study of a state-wide innovation that is established to recruit, support and retain outstanding teachers at the district level? (Bird 1986; Bird and Little, 1985; Bird and Alspaugh, 1986; Shulman and Hanson, 1985; Hanson, Shulman and Bird, 1985): A case book (Shulman and Colbert, 1986) was developed which includes vignettes written by

practising mentor teachers assigned to help beginning teachers accompanied by analytic commentary. The study attempts to improve in-service training of 900 mentor teachers assigned to assist beginning teachers, 2,500 new teachers participated in the study. 50% of these novices have a bachelor's degree but no previous teacher preparation and are teaching with an emergency credential. The majority simultaneously work towards their teaching credential. Each mentor was assigned to a group of novices within a geographical region. The mentors first completed a 30-hour series of training workshop that were some what broad in focus. Effective instructions, co-operative learning models, content instruction and classroom observation strategies were among the workshop topics. A research from FWL and a district official who taught staff development for mentors, conducted the case-book writing. Twenty-two mentor-teachers wrote six vignettes each describing experiences as a mentor teacher. They were asked to write about successful and less successful experiences with their assigned teachers and to describe their relationships with administrators and other colleagues. They were informed that their collective work would result in a case-book for training other mentor teachers. The duration was eleven weeks. 140 vignettes were coded out of which 49 were selected for the casebook. Analysis of these vignettes reveals several themes. The difficulties encountered when mentors and administrators (Principals) attempt to work together in assisting a new teacher are quite serious. The essence of these problems appears to rest with a state of role conflict that arises when mentors are charged with overseeing the induction of new teachers. The CMIP stature requires the mentor to draw a veil of silence in all interactions

with the principal regarding the new teacher. The study suggested that the mentor and Principal must combine the information and insight they have if they are to work as a team and do justice to the induction and support of beginning teachers.

2.7.5 The Virginia Beginning Teacher Assistance Programme (BTAP)

The Virginia Beginning Teacher Assistance Programme as reported by Virginia state department of education (1985) began in 1982. The programme came about as a result of the Board of Education resolution on certification of Virginia's teachers. The resolution was that the first time applicant for initial certification would be granted a 2-year non-renewable teaching certificate. Thereafter, to gain the collegiate professional certificate, a 5-year renewable certificate, the teacher must demonstrate functional knowledge of 14 competencies through satisfactory performance in the classroom. The STAP is all about providing the new teacher who fail to demonstrate knowledge of the 15 competencies on their first attempt. Both the assessment and the assistance components of the programme are based upon the research in effective teacher behaviour. The 14 competencies are: Academic learning time, Accountability, Clarity of Structure, Individual differences, Evaluation, Affective climate, Learner self-concept, Meaningfulness, Planning, Questioning skill, Reinforcement, Close supervision, Consistent rules and awareness.

The programme included 230 beginning secondary school teachers in 108 of Virginia's 139 school divisions. 56% of the teachers were women and 44% were

men. The 23 teachers were further grouped into two – the trained teachers and those who had no teacher training.

They were all observed for measures of the competencies using a classroom performance record (CPR). The CPR is a low-inference measure of teacher observation. Trained observers were involved in the use of CPR. Each teacher's scores on the 14 competencies were computed using combinations of items from the classroom performance record and the planning form used by the state Department of Education.

The results revealed that teachers who had teacher training scored significantly higher than teachers who had no teacher training especially on two competencies – affective climate and individual differences. Untrained teachers however scored higher than trained one on two competencies, Accountability and Questioning skill. The result corroborates Hoffman and Roper's (1985) finding that beginning teachers perceived themselves as deficient in the ability to keep students on tasks.

2.7.6 The Open University Postgraduate Certificate in Education (PGCE) Mentoring Scheme

The PGCE mentoring scheme reported by Kerry and Barrow (1995) is a distance learning competence based course of part-time Initial Teacher Training (ITT) for primary and secondary levels. The course duration was 18 months during which time the students undertook 500 hours of study and 18 weeks of school experience. Fifteen weeks of this time was spent in the classroom. Again 2 weeks of the 15 were spent in a secondary school. The assessment of students is a shared

judgement in which the view of subject mentors, professional tutors and faculty lecturers are given full weight.

The students plan and team-teach lessons with their mentor before teaching their lessons solo. Two questionnaires were used to get their overall views of mentoring. Some 97% of the students reported that mentoring helped them fit into their roles as beginning teachers and were satisfied with the quality of mentoring received. Sixteen percent rated their mentors as outstanding, 51% said that they were very good. Only 3% complained that the quality of mentoring they had received was poor. The findings also revealed that students recognise the important role which mentoring has in shaping their professional performance and improvements. Mentors are more concerned with smooth organisation and process than with the central issue of improving student performance in front of a class. Kerry and Barrow (1994) opined that the key to more effective mentoring is for a greater sharing of the central issue of mentoring which is improved classroom teaching.

2.7.7 Pilot Headteacher Mentoring Scheme

Many researchers such as Little, (1990), Wildman, Niles, Magliaro and MCLaughlin (1992); Olpers and Riesenkamp, (1979); Huling-Austin, (1978) provide good reviews of teacher mentoring in the U.S.A., U.K. and Holland as part of the induction of new entrants into the teaching profession. While most works on mentoring has been conducted in the business world and on new classroom

teachers, studies on use of mentoring in preparing aspiring principals are not common. Daresh and Playko (1994), in a review covering the 10-years period 1984-93 found 77 references to mentoring for educational administrators. However, most of these were US doctoral dissertations and there were very few published research studies. In the UK a small number of studies on headteacher mentoring were recently undertaken so far (Thody, 1993; Kirkham, 1994; Southworth et al 1994), while Walker and Scott (1993) described the system employed in Singapore.

About 20 US states now have scheme where mentoring is used as part of the preparation of aspiring principals, forming an element of their compulsory internship or field-based work. An experienced principal helps the protege (a new principal) to learn the relevant school district procedures, policies and practices by acting as a role-model.

Funding by the Danforth Foundation enabled several US programmes to employ mentoring as a means of fostering experiential learning for prospective principals (Milsteen, 1995). The mentors fulfilled a vital role, as their feedback enabled proteges to carry out a reflective, self-analytic review. The pilot headteacher mentoring scheme as reported by Pocklington and Weindling (1996) is a national attempt to support new headteachers through their first year of headship. The scheme differs from almost all previous mentoring programmes, in that experienced headteachers are trained to support people who have already taken up their first post as head. The scheme ran from January 1992 to March 1993. New

headteachers were paired with more experienced heads who had volunteered to act as mentors. Three hundred and sixty seven (367) new teachers and 447 mentors were involved in the scheme. Questionnaires and interview schedule were employed to obtain the views of those participating in the pilot scheme. Analysis of the two instruments revealed that the new teachers stated that they had benefited from the scheme. The benefits held in common were help with problems and issues of concern, reflecting on what it means to be a headteacher, obtaining another perspective, reducing the isolation of headship, improving self-confidence and providing emotional support. However the two most important benefits were that mentoring served as a source of support and reassurance and that the mentor was a resource to whom his partner could turn.

2.8 Effectiveness of Mentoring Compared to Traditional Supervision

As highlighted earlier on, supervisor's activities in Nigerian schools are not adequate enough and are more of evaluation. In fact it has been discovered to induce fear in teachers as the inspectors are regarded as masters eager to find faults with the principal and teachers (Anise, 1978:17-21). It was also stressed that if the traditional avenue cannot provide the necessary support for the teachers then the need arises for competent in-house instructional supervisors who would be interested in making use of available resources and time in optimising teaching competence of the teachers especially the neophytes. This purpose can easily be served by mentoring.

While the process of mentoring has been in existence for a long time in developed countries and once existed in an unrefined form in developing countries such as Nigeria, the impetus for systematic mentoring in modern institution has been mainly the result of work done in commercial contexts in the USA. For example, Clutterbuck (1986) sets out the advantages of mentorship schemes to companies as intrinsic satisfaction; personal development; peer recognition and advancement by grooming successors.

In a similar vein Odiorne (1985) identifies the process of mentoring closely with selecting high - flyers; the next generation of managers. Odiorne points out that this may be more visible in an open society such as the American compared to England or Japan. In England a good deal of experimentation with the role of mentor took place in the 1980's, but most of it was not done in educational contexts. The use of mentoring in educational context came up as a result of pressure to improve the performance of school managers. The school management Task Force report (1990) helped to incorporate mentoring into the training of headteachers.

Most writers agree that mentoring provides a context in which the mentee can reflect on his/her practice and through observation that of others (Ebutt, 1985; Smyth, 1991; Day, 1993; Elliot and Calderhead, 1993). Harvard and Dunne (1992:33-44) identify what the mentor oversees and manages the development of overall teaching competence; the routes to which, for the mentee, was through the acquisition of individual competencies. Baird (1993) emphasises the mutuality of

the benefits of this process to mentor and mentee. However Baird indicated that the process of mentoring is a long-term one and this is likely to be unsuitable in short courses of initial teacher education.

There are so many on-going researches on effectiveness of mentoring in USA, U.K., Holland and Germany. Booth (1993:183-197) reported in a study of 45 postgraduate certificate in Education (PGCE) students that 88% of students felt generally satisfied with the mentoring they had received. Effective mentors in this study made time available, were approachable, had tact and empathy, were not too directive, were good listeners, and gave constructive criticism and guidance.

The studies of Edwards, (1994); Collison, (1994); McBride, (1995); Kerry, (1994); Kerry and Farrow, (1995), found that mentors themselves recognised that a key mentoring skill to make mentoring very effective was observation and time for reflection. It would seem then that, at root, the key to success as a mentor is to be both an effective and a reflective practitioner. Both of these qualities seem to depend to a significant extent on the ability to undertake critical analysis of one's own and other people's lesson. These two important skills form the basis for mentoring effectiveness.

2.9 Mentoring as a Refinement of Instructional Supervision

The growth of the secondary schools with greatly increased numbers of students and consequent changes in the aims and scope of secondary education has brought instructional problems which clearly manifest the need for a sound programme of

supervision. The unprecedented increases in enrolment have greater variation in the nature and characteristics of the students. The range of intellectual capacity, for example, is wider, as is the range of interests, abilities and aptitudes. The result is that the secondary school teacher faces difficult problems in such matters as the adaptation of methods, materials of instruction to widely different types of students.

The typical secondary school trained teacher is a college graduate who has studied courses in general education together with the subject fields in which he expects to teach. Such limited preparation for teaching itself means that teachers begin their careers with need for more professional training which must be supplemented by continuation of their education in service.

The first years of teaching must be a continuation of professional education. There is great need for in-service programmes for teacher education and for suggestion, assistance and guidance, that the beginning teacher can develop desirable teaching procedures, broaden and increase his professional knowledge and skill.

Upon mentoring where-in mentors are supervisors rests the responsibility of aiding teachers to perfect their teaching procedures and stimulate them to study and learn to use better methods of instruction. The critical test of mentoring is the degree of its contribution to the improvement of all aspects of education.

In order to stimulate teachers professional growth, the mentor, as educational leader, provides for teacher participation in studying and planning a programme

for improvement. The mentor with his broad knowledge, experience and skill in teaching employs a direct process in aiding teachers.

The poorly prepared supervisor, with only limited understanding of the nature of supervision and the procedures which can be used, is being replaced by highly trained individuals who have a broad understanding of the nature of supervision and the procedures which can be used.

According to Ejoh (1976) the supervisor or inspector of school was seen

> *as one that seemed to see to everything that went wrong and very little that went right.*

Ejoh further observed that the sole aim of the inspector/supervisor in those days was to evaluate the standard of cleanliness and to evaluate if the school deserved to stay open or not. The inspector/supervisor was feared by all and hated by many. The fear of inspection kept teachers and headmasters on the alert and this thought might have contributed to the effectiveness of schools.

Many educators must have frown at the negative approach to the promotion of school effectiveness. The question is - if headteachers and teachers could do all they did to please the inspector, could this be continued after he had left? This was not likely. Fagbamiye (1989:66-274) pointed out the fact that the inspector was still not welcome (since his objective was still evaluative) and although we have more enlightened inspectors now, there were many inspectors who still focus their attention exclusively on the evaluative aspects of inspection.

Several other researches also highlighted the inadequacies inherent in supervisors and supervisory activities in schools.

Akhidero's (1975) investigation of supervisory practices at the secondary school level in Benin-City showed that the supervisory personnel (Principal, HOD, subject Teacher and Inspector) were not performing their duties as expected. This was corroborated by Akindojutimi's (1978) study that revealed that supervisory personnel in Ondo Local Government Area were ineffective and that teachers were yet to show the desired interest, devotedness and commitment on their duties.

Again Owoeye's (1982) report of a study carried out on educational supervision in secondary schools in Ekiti – South Local Government Area of Ondo State showed that the four categories of supervisory personnel were generally ill-prepared for and ineffective in the performance of their supervisory roles. Owoeye further stated that the concept of in-built supervision (mentoring) was yet to be embraced. Owoeye recommended among others that schools should be provided with essential instructional facilities and also that the concept of in-built supervision should be embraced.

In preparing solutions to the problem of ineffective supervisory practices, Okobiah (1979:292-300) proposed that a maximum of five schools with thirty teachers be placed under a full-time visiting instructional supervisor in urban areas. The rationale behind the proposal was that effective instructional supervision could

only be achieved if the supervisor-teacher ratio does not exceed one to thirty (1:30).

Adaralegbe (1972) suggested frequent inspectorial visit to schools while Adeshina (1977) advovated a shift from traditional routine visits to actual management whereby a group of senior inspectors are further supervised by principal inspectors. Onabamiro (1979) however suggested professional inspection by proxy. This practice involves experienced principals and head teachers inspecting schools in groups of ten.

Amodu (1997) advocated an instructional leadership role for Heads of department in a warm collegial and facilitatory HOD-subject teacher interaction to influence instructional improvement.

Goldhammer and Krajeswski (1980) suggested that instructional supervision which they considered a set of general supervision, should be the responsibility of inspectors as well as that of in-school management staff. Their reason was that in-school management staff were on the spot and they had greater responsibility to ensure effective instruction.

Amodu's (1997) study is relevant to this study as the heads of department are master teachers and could be seen as prospective mentors (after the expiration of term as HOD). However, the researcher viewed the emphasis on the heads of department as an instructional leader to a subject teacher in his department as a constraint. Department heads are selected on the basis of seniority rather their

competence as supervisors. In fact many of them may not satisfy the criteria for selecting mentors. Again the mentoring relationship is a helping relationship and information collected must not be used to make any evaluative judgements about the beginning teachers in order to ease their concerns about the functions of mentors. Therefore the heads of department cannot be selected as mentors as they are regarded as part of management and are supposed to fill the Annual Performance Evaluation Report (APER) of the teachers.

For this same reason above, Goldhammer et al (1980) Onabamiro (1979) and Adeshina's (1977) suggestions would not be appropriate for effective supervision as they all emphasised the school management staff as instructional supervisors and the fact that the approaches are cumbersome.

The option to all the suggestions is the adoption of Owoeye's (1983) that advocated for an in-built system of instructional supervision. This is in line with mentoring which is an instructional supervision strategy reflected in a warm collegial and cordial mentor- beginning teacher interaction in an 'open' supervisory climate positively related to teacher instructional improvement rather than the "close" climate characterised by a master-servant interaction.

Mentoring as a supervisory strategy has evolved from an inspectional, autocratic, authoritarian activity to one which utilises faculty participation in developing the improvement based on instructional leadership, democratic principles and group co-operation.

The reactions of teachers to older types of supervisory activity are definitely antagonistic (Ejoh 1976; Fagbamiye, 1981; Akindahunsi, 1984; Baiyelo et-al 1998; Oke, 1996 and Amodu, 1997). As many of these studies, show they desire supervision which will help them to meet their problems in the school. They are not opposed to the idea of supervision itself but to the fact that certain types of supervision do not help them. They believe that the most valuable supervision is that which supplies encouragement and stimulation and which recognises them as equals rather than subordinates.

The teachers wish the supervisor to act as a clearing-house of new ideals and to help them translate into practice their college education courses and the materials in educational publications. They also wish to share in leadership activities, and to learn how to carry on classroom studies, how to solve their problems themselves and how to help one another. They want the supervisor to show confidence in what they are doing.

Teachers find definite values in supervision which offers them an opportunity to exercise their abilities and intelligence and which uses techniques directed towards freeing their initiative and originality. All these laudable characteristics and attributes are all included in the mentoring relationship. Mentoring is therefore a programme of service education, for all teachers growing in their competence to teach and guide students' learning. School morale and unity become stronger because teachers recognise the fact that they are participating in improving the educational programme.

Mentoring is an effective instructional supervision and in-service training device for beginners and veterans. The traditional instructional supervision involves the establishment of departments or divisions of inspectorate with all required facilities spanning through infrastructure, equipment, staffing, funding etc.

In-service training of teachers as is being done at present requires the hiring of resource persons, venues, transportation and feeding of the participants, providing accommodation for participants and provision of stationeries.

All the listed requirements would definitely attract huge financial resources which are not easy to come by in this era of a dwindling economy. The only alternative that is cheaper and cost effective in solving the problem highlighted above is by employing the mentoring strategy in ensuring effective instructional supervision and in-service training of all categories of teachers. In operating a mentoring programme in the school, there would not be the need for setting up an elaborate inspectorate division or department as well as hiring resource personnel and venues for in-service training of the teachers. All the required personnel and facilities are already available on- the-spot in the schools.

On-the–job training, of teachers takes place everyday unlike at appointed times selected for inspectorate visit and in-service training at designated venues. Mentoring provides the professional and pastoral support for the early career needs of the beginning teachers as well as ensuring that the veterans are current with innovation in their fields.

The mentoring strategy if backed up with adequate supply of appropriate manpower and materials to schools would go a long way in reducing Government's expenditure with the excess channelled to another pressing area in educational system, while effective instructional supervision and in-service training of all cadres of teachers would be enhanced.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter discusses the design and procedure for the pilot, main study and data analysis.

3.1 Research Design

The study was divided into two phases:

(a) survey (b) experiment

This work combines both qualitative and quantitative methods.

The survey aspect includes the use of questionnaires (quantitative) and observation of subjects at work (qualitative) for classification purposes.

The experimental phase employs the randomised pretest-post test control group design. It involves two groups of subjects: one experimental group and one control group. This can be diagrammed as follows.

GROUP	PRETEST	TREATMENT	POST TEST
EXPERIMENTAL GROUP	T_{ie}	X	T_{2e}
CONTROL GROUP	T_{ic}	-	T_2

As can be seen from the diagram, two groups were employed in this design. The experimental group (T_{ie}) received treatment X (mentoring) while the control group T_{ic} was not mentored.

3.2 Conceptual Framework

The research model is an adapted form of Magliaro, Wildman, Niles and McLaughlin Framework for conceptualising mentoring. The beginner views the mentor in the role of a teacher, leader, counsellor, model and sponsor. Magliaro et-al (1989:471-493), identified three major contributions that are likely to support or detract mentoring relationship as mentor and beginner's characteristics and contextual factors.

The characteristics of beginners that influence mentoring relationship paralleled for the most part, the mentor characteristics and they are the role and personality (Combs, 1974). The beginner has been in a position of a learner for almost twenty years. His thoughts are very much influenced by the way in which he experienced his own education.

This will in turn affect his views on teaching profession at the entry point. The contextual factors include the features of the school working environment that influence the success of any helping relationship.

The research model, which is an adapted form of Wildman et-al (1989) employed in this study involved only the beginning teachers in their early service years

whereas the original model included both the pre-service and in-serve beginning teachers.

The research model represented in Figure 3.1 consists of four components each of which contains a number of factors. Each factor was operationalised as a set of variables measured by interview schedule, questionnaire items and observational schedule.

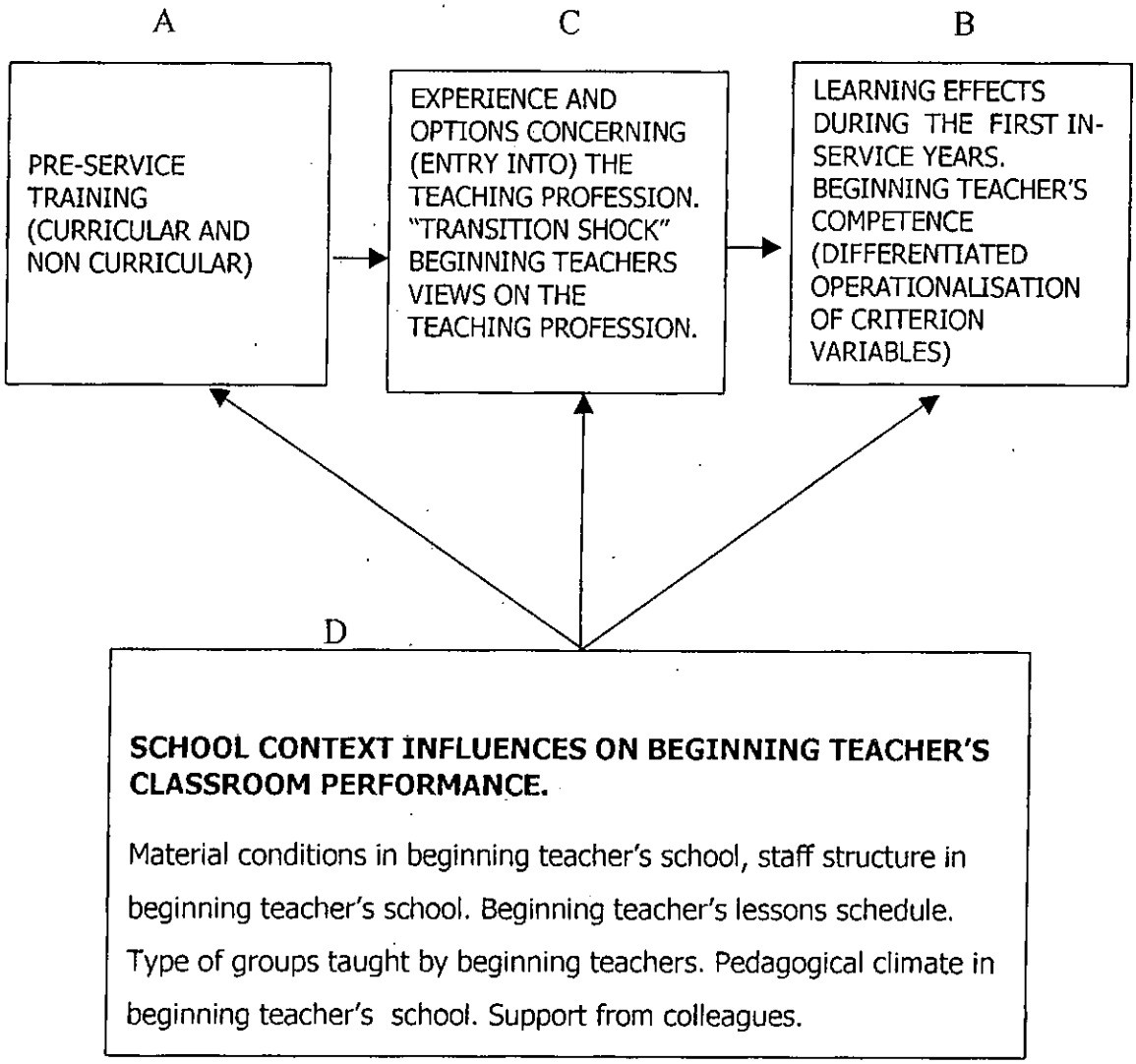


Figure 3.1: The Adapted Form of Magliaro, Wildman, Niles and MCLaughlin [1989] Research Model:

The variables grouped within components lettered B and C and to some extent A count as independent while those grouped within component lettered D count as dependent. Condensed into one sentence the research model addresses ways by which the co-operation between beginning teachers and experienced teachers combines with factors in school environment to eventually produce specific types of classroom performance in beginning teachers.

Component C is the core of the research model. Here the beginning teacher dyad is mentored by a trained mentor. Probe was made into beginning teachers' inservice experiences to measure transition shock as indicated by experiences in classroom interaction. Also, attitudinal items concerning beginning teacher's views on the teaching profession was used (Lorhe 1975).

Component D comprises various influences of non-curricular programmes, - material conditions in beginning teacher's school and more importantly the factor meant to indicate to what extent school management and teaching staff were willing to facilitate beginning teacher's competency level enhancement. For instance, do colleagues engage in innovative teaching activities and continued professional training?

Component B contains a set each of 23 specific behaviours (STOS) and 15 dependent criterion variables formulated in terms of teaching skills (Odunusi, 1981:106-111).

3.3 Pre-Service Training

Broadly speaking this study assumes that the teacher would have gone through pre-service training that is, the teacher would have acquired a certificate before entry into teaching. Thus it is assumed that some factors have been catered for. These factors are:

a) Curricular and non-curricular programme condition.

b) Organisation and content of co-operation during student teaching.

c) Contents of college based pre-service seminars

d) Learning effects during pre-service programmes.

Curricular and non-curricular (external), decisions and actions shape students' acquisition of teaching competence during pre-service programmes, what beginning teachers experience and learn during entry into the teaching profession is determined by the pre-service curriculum.

The factors within component A (though not specified) would have described the alternation between college based and school practice periods in pre-service programmes.

Experiences and Opinions of Beginners on Entry into the Profession

This contains retrospective opinions obtained from beginning teachers about the relevance (theoretical and practical) of their pre-service training. The pre-service experience would definitely be the prism through which the beginner views the authentic classroom situations after being a student for a long time.

So many assumptions at this stage would definitely give way to realities. The opinion of the beginner at this stage influences how long he stays in the profession.

3.4 Population and Sample

All secondary school beginning science teachers in Lagos State form the population of the study. The then fifteen Local Education Districts [LED] were grouped into

(a) Urban comprising Lagos Island, Lagos Mainland, Ikeja and Eti-osa LEDS.

(b) Semi Urban made up of Surulere, Kosofe, Mushin and Somolu LEDS.

(c) Rural: Included Ojo, Agege, Alimosho and Ikorodu LEDS.

(d) Riverine consisted badagry, Epe and Ibeju Lekki LEDS.

This measure is to ensure that all subjects are provided an equal chance of being in the sample.

A LED was sampled from each of the groups for the pilot study. These were Eti-Osa [19, Schools], Somolu [17 Schools], Ikorodu [24 Schools] and Epe [26 Schools] LEDS. Two schools were randomly selected from each of the four LEDS.

Eighty Science teachers and eight principals were again randomly selected from the four LEDS sampled.

The researcher arrived at 80 teachers based on the pre-pilot study that revealed average of 10 science teachers per school. In some schools with large population of students, more than 10 science teachers were found.

Four hundred science teachers, twenty principals and twenty vice-principals were randomly sampled for the main study from twenty schools of ten LEDS. The LEDS sampled for the main study were Lagos Mainland, Ikeja, Surulere, Kosofe, Ojo, Agege, Alimosho, Badagry, Mushin, and Ibeju-Lekki.

All the 32 identified beginning teachers from TCQ were randomly assigned into the experimental and control groups at sixteen per group. One hundred and forty-six teachers were identified as beginners in the main study. Eighty beginning teachers were selected by stratified random sampling from the 146 identified beginners. Teachers in their first and second year of teaching were mostly selected while some third year beginners were also included where the first and second year beginners were, not available. The eighty selected beginning teachers were grouped into experimental and control groups at forty per group.

Only the experimental group was exposed to mentoring [treatment]. Post-test took place after twelve weeks [one school term] interval.

3.5 Data Gathering Instruments

Five major instruments were used to gather data for both pilot and the main study. These were

1. Questionnaire: three questionnaires were employed in eliciting information.

(a) The Teacher Classification Questionnaire (TCQ) was used in identifying and classifying all the subjects. TCQ consists of twenty-one items.

(b) The Heads of Department Perception of status of Beginning Science Teachers (QHODPBT) questionnaire. This consists of twelve items.

(c) The Principals Perception of status of Beginning Teachers (QPPBT) questionnaire. It has ten items.

2. An Interview Schedule: The Beginning Teacher Interview Schedule (BTIS) was administered on all the identified beginning teachers. It consists of seven items.

3. A checklist: the competency skills checklist was used during observation of all subjects and during mentoring session. It consists of fifteen items.

4. The Science Teacher Observation Schedule (STOS) was used in observing the teachers for classification as well as for mentoring purposes. It consists of 23 specific classroom behaviours of the teacher.

5. The record log book: The log book was used to keep records of all classroom encounters including all demonstrations, observations and feedback sessions.

An overview of the research design is represented in Table 3.2

TABLE 3.2: OVERVIEW OF THE RESEARCH DESIGN

MODE	SEQUENCE OF DATA COLLECTION	INSTRUMENTS CONCERNING RESEARCH MODEL COMPONENT	BCD	DATA SOURCES		METHODS OF ANALYSIS
				PILOT	MAIN STUDY	
QUANTITATIVE	1. 3.	Questionnaire TCQ at the beginning of the study. 2 questionnaires after classroom observation (i.e after classification.)	B,C,D	80 teachers from 8 schools of 4 LGA 8 HODs and 8 principals.	400 teachers from 20 schools of 10 LGA 20 HODs and 20 principals.	Comparison of sample using descriptive statistics. Analysis of data structure Analysis of contrasting groups.
	4.	1½-hour focused interview after classroom observation and first questionnaire.	BCD	32 identified beginning teachers	80 beginning teachers out of 146	Description of Beginning teachers work situation and individual learning
QUALITATIVE	2.	11 three minute segment classroom observation of 23 specific behaviours and 15 item competency skills checklist.	B & D	80 All (Both)	400 (teachers veteran & beginners)	Comparison of strong and weak points in classroom performance and verification of interview statements.
	5.	11 three minute segment classroom observation of 23 specific behaviours and 15-item competency skills checklists.	B &D	32 16E 16C beginning teachers	80 40E 40C Beginning teachers	Comparison of strong and weak points in classroom performance and verification of interview statements.
	6.	Mentoring Treatment Demonstration observation support meetings.		16 (16E) Beginning teachers	40 40E Beginning teachers	Feedback analysis at support meetings.
QUALITATIVE	7.	11 three minute segment classroom observation of 23 specific behaviours and 15-item competency skill checklist.	B&D	32 16E & 16C	80 40E & 40C	Comparison of strong and weak points in classroom performance and further verification of interview statements.

3.5.1 Developments of the Research Instruments

The Teacher Classification Questionnaire (TCQ). All the items in the questionnaires developed based on from extensive literature search reports and from items used in similar studies in and outside Nigeria.

The questionnaire TCQ consists of two parts. The first Part sought demographic information and consists of eleven items. The remaining ten items are to elicit information on professionalism on the part of the subjects.

The TCQ (see appendix A) was administered to all the subjects in both pilot and the main studies for purposes of classification into beginners and master teachers. Examples of some items contained in the TCQ are:

13. When did you receive the last visit or inspection by the state officials?
14. Who does the supervision of each subject?
15. Do you write Notes of lesson?
17. When you joined the Teaching Services did you undergo any initial induction course?
18. Do you derive enjoyment in teaching?
21. Do you consult experienced colleagues when faced with difficulty in your classroom teaching?

3.5.2 The Heads of Department Perception of Beginning Teachers' Status Questionnaire (QHODPBT)

The questionnaire consists of 12 items. The items seek information on the perception of the beginning teacher's status by the head of department. The HODS are to rate the beginning teachers performance on a Likert type-scale of 1-5. The questionnaire was administered to the heads of science department in the pilot and main studies.

Examples of some items contained in QHODPBT are:

1. The teacher's lesson planning is adequate
2. The teacher radiates self-confidence
3. The teacher constructs and improves learning teaching aids in sciences.
4. The teacher works co-operatively with other subject-teachers.

3.5.3 The Principal's Perception of Beginning Teacher's Status (QPPBT)

The questionnaire consists of 10 items. The items attempt to elicit information on perception of principals on status of beginning teachers. The questionnaire was administered to the principals alone in the pilot study while the Vice-principals were included in the sample for the main study.

The principals were asked to rate the performance of the beginning teachers on a likert-type scale of 1-5. Some of the items contained in QPPBT are:

1. The teacher radiates self-confidence

2. The teacher maintains a very cordial relationship with other teachers.

3. The teacher makes his students like and respect him.

4. The teacher prepares and organises his lessons adequately.

3.5.4 The Beginning Teacher Interview Schedule (BTIS)

The BTIS consists of 7 questions which were generated from observations of teachers at work personal records of teachers and the teaching-learning conditions inspected by the researcher. The interview schedule was administered orally to all the identified beginning teachers in the pilot and the main studies.

Examples of some items in BTIS are:

1. rate the following identified problems of beginning teachers.

   (a) characteristics of good teaching

   (b) decisions about teaching methods

   (c) Administrative tasks

   (d) Materials/Resources

   (e) Classroom discipline.

2. In the first few years of teaching, the beginning teacher learns many important things. What are some things you have learnt that you needed to know?

3. What advice would you give a beginning teacher based on your experience?

This instrument (BTIS) is represented in appendix D.

The Competence skills Checklist (CSC):

The CSC is a checklist initially developed by Odunusi (1981), and identified as fifteen competencies crucial to science teaching (see appendix E).

The competency skills checklist Odunusi (1981) was adopted in this study. Some of the items were reframed to include items from recent research reports in the teaching of science [Carr, 1993; Nzewi, 1986 and Nwosu, 1995]

The instrument was administered on all subjects for classification and mentoring purposes. The instrument was administered alongside the STOS to establish the competence of subjects.

The CSC is represented in appendix E.

Examples of some of the items in CSC are:

(1) A sound science subject background.

(2) Knowledge in modern science teaching strategies

(3) Planning and organisation of instruction

(4) Incorporation of effective laboratory activities into instruction

3.5.5 The Science Teacher Observation Schedule (STOS)

The STOS, an observation schedule for science teachers was designed by Galton, Eggleston and Jones (1979). The STOS is an instrument of obtaining measures of competencies of the teacher. The STOS was adopted for this study. The instrument

is shown in appendix F. The instrument consists of 23 specific classroom behaviours of the teacher or events called signs. The event or sign observed every 3-minute was recorded.

TABLE 3.2:COMPOSITION OF TEACHER AND STUDENT INITIATED ACTIVITIES

S/NO.	ACTIVITIES	EVENTS
1.	Teacher Talks	7
2.	Teacher makes statements	4
3.	Teacher directs pupil to sources of information	4
4.	Pupils seek information or consult	4
5.	Pupils refer to Teacher	4
	TOTAL	**23**

The STOS was used in observing the teachers for competence classification as well as mentoring purposes.

3.5.6 The Record Log Book:

The log book was used for entries of classroom encounters, demonstrations, observations, support meetings with dates.

3.6 Instrument Validation

Face Validity of TCQ

The Face validity of the questionnaire (TCQ) was assessed by a panel of science educators comprising six lecturers at the University of Lagos, five senior research officers with the Nigerian Educational and development Council (NERDC), three research officers at the West African Examination's Council (WAEC), and six master science teachers, not participating in the main study in Lagos metropolis.

The panel was asked to determine the appropriateness of the items for classifying and supporting the science teachers involved in the study.

3.6.1 Construct Validity of TCQ

In order to establish the construct validity of the items of the TCQ, the questionnaire was administered to a random sample of 50 science teachers drawn from schools not participating in the main study.

The purpose was to see if the items of TCQ represent the testee's traits under test. To put it other way-do the items actually reflect traits required to classify the teachers?

The respondents were unanimous in their rating of the questionnaire items and strongly favoured the use of the instrument in classifying as well as in eliciting information for providing support for beginning teachers.

3.6.2 Coefficient of Stability

To make the statistical backing to the analysis more acceptable, a test-retest exercise using the Pearson product moment correlation Coefficient, on each dimension on the questionnaire was embarked upon. A random sample of 40 science teachers drawn from schools and LEDS not participating in the main study was made and administered the questionnaire. After an interval of four weeks, the questionnaire was re-administered on the same subjects to determine the consistency or otherwise in the rating of the respondents.

The result of the analysis is as represented in table 3.3

Table 3.3: Correlation of Test-Retest of Dimensions, on 40 Teachers on TCQ

VARIABLE	NO OF ITEMS	TEST POSITION	$\bar{x}$	SD	r_{tt}
General	12	1st	40.62	5.34	
		2nd	44.75	3.81	0.76
Lesson Planning	2	1st	11.25	2.63	
		2nd	12.01	2.71	0.73
Supervision	4	1st	14.81	2.87	
		2nd	14.07	2.32	0.89
Attitude	3	1st	14.73	2.67	
		2nd	13.93	3.43	0.85
Teacher support	3	1st	17.43	3.86	
		2nd	15.62	4.83	0.78

From table 3.3 the correlation coefficient (r_{tt}) value obtained ranged between 0.73 to 0.89. These values were recognised as high and adequate for studies in social and behavioural sciences consequently the instrument was accepted as appropriate and consistent.

3.6.3 The Head of Department's Perception of Beginning Teachers Status Questionnaire (QHODPBT)

The QHODPT was developed with the purpose of helping the researcher to obtain the HOD's rating of beginning teachers.

Twenty heads of science department were administered the questionnaire. They were drawn from twenty schools not participating in the main study. QHODPT was validated as was done with TCQ.

The dimension correlation coefficient recorded by QHOPBT ranged between 0.87 and 0.99 as represented in table 3.4.

TABLE 3. 4 Correlation of Test-Retest in Dimension, Using 20 Teachers on QHODPBT

S/No.	Dimensions Investigated	No of items	Correlation coefficient (r-value)
1.	Lesson Planning	2	0.99
2.	Subject knowledge	3	0.98
3.	Teaching Technique	2	0.96
4.	Use of improvised teaching aids	3	0.95
5.	Co-operation with other teachers	2	0.87
6.	Comportment	2	0.98
7.	Reflection on Practice	2	0.9

3.6.4 The Principal's Perception of Beginning Teachers Status Questionnaire (QPPBT)

The QPPBT items are similar to that of QHODPBT. The QPPBT was validated as was done with the QHODPBT and BTCQ.

Twenty principals drawn from twenty schools not participating in the main study were administered the QPPBT. The 10 items were grouped into six dimensions. After an interval of four weeks the questionnaire was readministered on the 20 principals to determine the consistency of the respondents' ratings. The results is represented in table 3.5.

Table 3.5 Correlation of Test- Retest of Dimensions on 20 Principals Using the QPPBT

S/No.	Dimensions Investigated	No. of Items	Correlation Coefficient (r-value)
1.	Lesson Planning	2	0.96
2.	Subject knowledge	3	0.97
3.	Teaching Technique	2	0.99
4.	Use of improvised teaching aids	2	0.95
5.	Comportment	2	0.93
6.	Reflection on Practice	2	0.98

3.6.5 The Beginning Teacher Interview Schedule (BTIS)

The face and content validity of the items in BTIS were assessed by four senior lecturers from the University of Lagos. The items were considered adequate for the study after examination.

3.7. Procedure for the Study

The study was carried out in three stages pre-pilot, pilot and the main study.

3.7.1 Pre-Pilot

Pre-pilot study was carried out for assessing the effectiveness of the instruments. The researcher paid preliminary visits to sixteen schools in four Local Government Areas of Lagos Metropolis for the purpose of determining and selecting the schools of interest and for the administration of the research instruments for the pilot study. This was done after obtaining permission from the Teaching Service

Commission (TESCOM) to allow the researcher to have access to their staff and facilities for the duration of the research.

Two instruments were administered at the pre-pilot stage. They were the Teacher Classification Questionnaire (TCQ) and the Beginning Teacher Interview Schedule (BTIS).

Sample:

The sample for the pre-pilot study comprised twenty science teachers from four schools randomly selected from four Local Education Districts [LEDS] in Lagos Metropolis. The sample included both beginning and veteran teachers. The sample compared reasonably to the teachers meant for both the pilot study and the main study in Lagos metropolis. Fourteen respondents returned the questionnaire administered to the twenty science teachers for the pre-pilot study.

3.7.2 The Pilot Study

The pilot-study was carried out in Lagos metropolis between June and September 1995. The purpose of the pilot study was to further sharpen the instruments and methodology for the main study.

The pilot study was carried out in two schools from each of the four chosen Local Education Districts [LEDS]

The subjects for the pilot study consisted of Eighty science teachers drawn from eight secondary schools that were not to be included in the main study.

A stratified random sampling techniques was used in selecting the Local Education Districts [LEDS] to ensure that rural, urban, semi urban, riverine as well as big and small schools were represented. Ten science teachers were however randomly selected from each of the eight schools.

3.7.2.1 The Teacher Questionnaire

The TCQ was designed to classify the teachers into the two groups – beginners and veterans.

The questionnaire was administered on eighty science teachers from eight secondary schools outside the area of main study in four Local Education District [LED] of Lagos State. On the questionnaire, the respondents were asked to indicate their responses to certain statement by ticking the appropriate columns (see appendix A).

3.7.2.2 The Principals and HODs questionnaire

The Questionnaire QPPBT was administered on eight principals and eight Heads of science department from eight schools outside the area of the main study in the chosen four Local Education Districts [LEDS] of Lagos State.

The respondents were asked to indicate their responses to certain statements by ticking in the appropriate columns of "Excellent performance level" "Very Good performance level" Good performance level" "Poor performance level" "Very poor performance level".

3.7.2.3The Beginning Teacher Interview Schedule (BTIS)

The purpose for developing and using the BTIS was to complement and confirm other information gathered about the teachers using the questionnaires TCQ, QHODPBT, QPPBT. All the thirty-two identified beginning teachers were interviewed. To lay a basis for the interview the researcher asked each of the beginning teachers if she could visit their classes for one school day and conduct the interview immediately afterward. The interviews took place in their schools. The average duration of these interviews was two hours.

The interviews were recorded with a tape recorder and were played back at the end of each interview session for both the interviewer and the subject to hear. The interviews were later transcribed verbatim. Although in all conducted interviews the questions asked were of the half–open types the beginning teacher took greatest liberties in digressing from the interviewer's points of interest. Even so, the researcher thinks she succeeded fairly well in achieving a close conceptual alignment between dimensions explored in the interviews and in the questionnaires. The researcher feels reasonably confident that the research model presented earlier reflects not only the quantitative, but also the qualitative data.

3.7.2.4 The Science Teachers Observation Schedule (STOS)

The STOS was administered to the eighty subjects for pilot study. Every details of the classroom interaction were recovered by the observers and recorded.

The thirty-two identified beginning teachers were then observed three times each using STOS after they were grouped into control and experimental group. The experimental group was mentored for one school term after which STOS was administered again in both groups.

3.7.2.5 The Competency Skills Checklist (CSC)

The CSC was administered alongside STOS to further establish the level of competence of the subjects. Apart from recording the classroom interaction at regular intervals of three minutes, the researcher with the trained observers were ticking the skills in the checklist if performed by the beginning teacher.

3.8 Modifications in Main Study

The main study's procedure was slightly modified based on some findings of the pilot study. Although the results obtained from the pilot study showed a reasonable acceptability and suitability of the instruments and research design, it was however discovered that the principals and heads of department were a little bit biased and too idealistic in their assessment of the beginning teachers. Therefore other independent sources were sought for additional information. Consequently the opinions of the Vice principal and some senior teachers were obtained on perceived problems of beginning teachers.

The questionnaire TCQ was retyped (back and front) due to the complaints from respondents that they had to go through many pages. This definitely reduced the size of the questionnaire while the content remained unaltered.

3.9 The Main Study

Data were collected from twenty schools in ten Local Education districts of the then fifteen Local Education Districts of Lagos State between January and April 1996. Four hundred teachers, twenty principals and twenty vice- principals were sampled.

The Teacher Classification Schedule (TCQ)

The TCQ was administered on all the four hundred science teachers of the twenty secondary schools sampled. The sample included the teachers of Biology, Chemistry, Physics, Integrated Science, Mathematics, Agricultural Science and more than ten teachers were found in each school handling the subjects listed above and classified as science subjects. However in selecting ten teachers in each of the twenty schools sampled for the main study emphasis was placed on having more Integrated Science, Biology, Chemistry, Physics and Mathematics teachers.

The twenty schools were still selected to reflect urban, rural, semi-urban and riverine Local Education Districts as done during pilot study for a good representation of all subjects. Two schools were randomly selected in each of the ten Local Education Districts sampled. Mixed schools were sampled throughout the study duration for uniformity. Composition of Questionnaire (TCQ) sample is shown in table 3.6

Table 3.6 Composition of Teacher Questionnaire

Subject	Questionnaire Sample, (number of respondents) subject taught					Total	Percentage
	P	VP	HOD	BT	VT		
Integrated Science	-	-	3	34	32	69	18.65
Biology	4	3	7	42	47	103	27.84
Chemistry	1	1	3	20	24	49	13.24
Physics	2	1	2	13	18	36	9.73
Mathematics	1	2	3	23	31	60	16.22
Agricultural Science	1	1	2	14	12	30	8.11
Non-Science Subject	11	12	-	-	-	23	6.22
Total	20	20	20	146	164	310	100

P represents Principal

VP " Vice Principal

HOD " Head Of Science Department

BT " Beginning Teachers

VT " Veteran Teachers

3.9.1 Administration of QHODPBT and QPPBT

The two questionnaires were administered to the principals, vice principals and heads of science departments of the twenty schools sampled. In the main study the vice -principals were included to solve the problem of bias in perception of the beginning teachers by the principals and heads of department noticed in the pilot study. The principals, vice principals and heads of science departments in twenty schools of the chosen ten Local Education Districts of Lagos State were involved

in the main study. The same method as used in the pilot study was employed. As expected not all the principals and Vice-principals were science graduates. All beginning teachers were sought.

3.9.2 Administration of Interview Guide (BTIS)

The one hundred and forty-six identified beginning teachers were further interviewed using the BTIS. All teachers within one to five years experience were classified as beginning teachers in keeping with Doyle's (1988) study that says it will take "five years for a beginning teacher to partially learn the rope". The researcher however included those in their first, second and third year of teaching employing the stratified random sampling.

3.9.3 Administration of STOS

The Science Teachers Observation Schedule (STOS), an instrument for obtaining measures of competencies of the teachers was administered on the three hundred and ten respondents. The STOS consists of twenty-three specific classroom behaviours of the teacher or events called sign. The observer indicates which of the signs observed during a 3-minute segments during each of two class periods.

3.9.4 Observation of the Beginning Teachers

Eighty of the one hundred and forty-six identified beginning teachers were selected by stratified random sampling. Only those in their first and second year of teaching were selected and a few of those in the third year where the researcher could not have the first and second year teachers.

The sampling was done on the basis of four beginning teachers, per each of the twenty schools of the ten Local Education Districts of Lagos State included in the main study.

The eighty selected beginning teachers were further grouped into experimental and control groups comprising forty teachers each were observed. Each school had two beginning teachers in the experimental and two in the control groups. All the eighty teachers were observed using STOS in eleven 3-minute segments during each of three class periods for twenty-three specific classroom behaviours and the 15-item competency skill checklist.

3.9.5 Selection of Mentors

Twenty master teachers were selected as mentors using twelve criteria for selecting a mentor, (Wildman, Magliaro and Niles 1989), and after processing information elicited by the questionnaires, in-depth interviews, observation at work and confirmation from records of service. The master teachers selected were those who possessed teaching qualification and who had been teaching for ten years and above. The researcher looked for likeable traits in the would-be-mentor such as patience, honesty, humility, commitment to the profession, and above average intellect during observation at work, interview and glimpse of records of service. In choosing a mentor the researcher was careful not to choose a mentor that is likely to fill the APER (Annual Performance Evaluation Report) of his or her mentee. For this reason, the heads of department were not selected mentors as

they are regarded as part of management. Mentoring is a helping relationship and information collected was not used to make any evaluative judgements about the beginning teachers. This fact eased the beginning teachers' concerns about the mentors function.

The twelve criteria for selecting the mentors are as follows:

1. Willingness: The teachers must be willing to be mentor. In fact this is the most important of the criteria as willingness would go a long way to support and maintain the mentoring relationship. A reluctant mentor is not likely to serve the mentoring purposes.
2. Sensitive: A mentor must be sensitive and should know when to back off. The mentor at all times should be alert to changes in the behaviour of his mentee.
3. Helpful: The mentor should be helpful but not authoritarian. He can only make suggestions to the mentee reflecting on his own practice. The mentoring relationship is a helping relationship and not a servant-boss relationship. The suggestions by mentors must be made in such a way that the mentee would see them as helpful and crucial in his practice.
4. Emotional Commitment: A successful mentoring relationship is always one in which the mentor is emotionally committed to his mentee. That is the mentor builds a positive relationship by attending to personal concern of the beginner. The mentor must respond accurately to the legitimate emotional questions of his mentees (Hall and Loucks, 1978).

5. Astute: A mentor should be astute that is, knows the right thing to say at the right time. This is important in the mentoring process to gain the mentee's confidence.

6. Diplomacy: A mentor must be diplomatic for example, they must know how to counteract an advice given to their beginning teachers by others in a way that will not bring in any animosity on either side.

7. Alertness: A mentor should be alert, for example, they should be able to anticipate problems and be ready to look for solutions.

8. Encouragement and a nurturant: In this case the mentor should help in providing an environment for growth after considering the total personality of the mentee.

9. The mentor must be timely in praising when success are recorded and gently making suggestions where weaknesses are noticed.

10. The mentor must be careful to keep the beginning teachers problems confidential and should not refer to it in conversation with management.

11. The mentor must show some measure of enthusiasm to teaching as a profession.

12. The mentor must be a good role model at all times, that is, his actions must be worthy of emulation by his mentee.

3.9.6 Training of the Mentors

The twenty selected mentors were further trained by the researcher. The focus of the training was to provide intensive training in supervision to these classroom teachers selected as mentors who would now serve as a primary resource to the beginning teachers.

The training was school based, on-site and occur over a period of four weeks. An average of six meetings was recorded for each mentor at 3 hours per week.

The instruction for the mentors was based upon theory research and practice. The curriculum for the training based on the work of Friere (1981) and Wagner (1985) included the following topics:

(a) Building a helping relationship

(b) Effective teaching

(c) Models of supervision and coaching

(d) Differentiated supervision

(e) Problem solving

(f) Ending a relationship.

The topics were structured in a mentoring training package as competencies to be fostered in the beginning teachers by the trainee mentors. (The Teacher Mentoring Programme (TMP) Training Package is presented in table 3.7

The TMP was assessed for face validity by four science educators at the University of Lagos, four Veteran secondary school teachers and two senior research officers with the NERDC.

Individual relationship- building conferences were held with each mentor. The researcher taped each session, clarified the content and feelings presented and gave the tape back to the trainee mentor for reflection.

This helped the researcher to develop an understanding of how each mentor processes experience, how best to structure the learning and how to provide feedback. The mentors were also able to reflect on the same issue as well as the elements of relationship development through dialogue.

The goal of the curriculum was to develop the prospective mentor's ability to be empathic, symbolise experience, be autonomous and to act on democratic principles in accordance with the Heath (1977) model.

By the third week, the focus was towards intensive practice by supervising a beginning teacher or a colleague. This turned out to be both the highest anxiety producing and the most significant of all the learning experiences. The researcher would model an approach in class and then with cycles of clinical supervision (pre and post-observation) and training using Joyce and Shower's (1982) coaching model. The prospective mentors would on a reciprocal basis go through the same experiences.

During the meetings, plans for further sessions and for case management were reviewed.

By the end of the fourth week the teachers were anxious to try out their skills. The mentor thought they were effective teachers prior to the training. At the end of the training all commented that their initial levels were, in fact, too often only partially effective. All commented that after the training was completed they were more effective teachers in their own classrooms.

3.9.7 The Mentoring Process

The mentors can help neophytes in many ways. Five major areas were identified in the mentoring process. The areas beginning with the easiest and ending with the most difficult, are:

(a) At the beginning of the academic year, mentors can help new teachers learn about the procedural demands of the school, such as attendance and diary filling procedures.

(b) Mentors can provide opportunities for teachers to observe other teachers so as to have access to several kinds of models.

(c) Mentors can share their own knowledge about new materials, unit planning, curriculum development and teaching methods.

(d) Mentors can engage teachers with classroom management and discipline.

(e) Mentors can engage teachers in reflection about their own practice and can help them adapt new strategies for their own classrooms.

The topics listed in the package used in training the mentors included all the above. The process of mentoring should also include the following:

(a) Establishing the Working Relationship

One of the first challenges reported by the mentors is establishing a working relationship with their beginning teachers. For example if they assert themselves too strongly or inappropriately, they may be perceived as rude or disruptive. On the other hand, if they assert themselves too little or skilfully, they may be ineffective. For either errors they are likely to be criticised, rejected or ignored. So the mentors walk a narrow path. At risk is the possibility that an excellent teachers could be an unsuccessful mentor. The initial interactions would set the stage for a longer lasting relationship. During this process the mentors faced the challenge of deciding how aggressively they have to assert their expertise in a credible manner.

The questions asked by mentors were: how do they encourage teachers to request assistance? How do they observe another teacher when they haven't been asked to? What can they do when a teacher refuses all offers of help?

During the mentoring process the mentors were encouraged to dip into their repertoire of various strategies used during their training to establish contact and assert their expertise.

At the initial stage the mentor discovered that most of the beginning teachers were either embarrassed to request for any help or did not know how a mentor could be useful. Thus it was not until the mentor established precisely how he could be helpful with individual teachers, and began to establish some collaborative agreements, that relationships began to evolve.

(b) Individual Consultation

After establishing the helping relationship the next step is the formal and informal individual consultation outside the classroom. It is during these kinds of interactions that mentors can act as a sounding board, demonstrate their expertise, and create an atmosphere of mutual respect and trust. Often informal conversation about teaching and more formal consultations about specific pedagogical practices are needed before teachers are ready to be observed and coached by a mentor.

In a case reported by a mentor, he was able to help a neophyte understand the concept of unit planning by working this out with her. After one conference the beginner was able to plan a unit herself.

(c) Observation and Coaching

This is the part of mentoring that has the greatest potential of getting close to the actual work of teaching. The previous process handled orientation and planning. The coaching process begins with something to coach, for example a shared agreement about some knowledge, skill or practice that mentors and their colleagues decide to work on together.

Observation and Coaching work depends on a number of conditions. The first is sufficient opportunity and time to observe and talk about what you have observed. A written record of the observation that is convincing enough to the beginning teacher and makes her teaching and methods public can provide the basis for talking about the lesson.

It is often appropriate for mentors to make suggestions about how to improve teaching. This is particularly important if a teacher is having difficulty. But real learning only occurs when teachers participate in a reflective analysis of their lessons. Mentors must then help the beginning teacher adapt new knowledge to what they already know.

In summary the success of coaching depends on:

(1) collaboratively the agreeing on the purposes for the observation, as in a pre-conference;

(2) demonstrating credibility by offering analysis supported by concrete evidence e.g written record using the log book;

(3) engaging in inquiry or problem solving during the pre and post-observation conference.

(4) Creating an atmosphere of mutual respect and trust

(5) Ensuring that help is confidential.

(d) Modeling

Modeling is a kind of coaching strategy. By being shown how to teach a lesson, a teacher gains access to a new model of instruction. It is always important to discuss and analyse the lesson after the modeling has occurred, and help the teacher to adapt the technique to his/her pedagogical practice.

Teachers gain access to models of instruction by watching a veteran teacher teach his/her class. Occasionally, in a successful mentoring relationship, a teacher will ask a mentor to model instruction in the teacher's classroom.

All the twenty mentors and forty beginning teachers in the experimental group in the selected twenty schools participated in the mentoring treatment. All the activities and interaction during the mentoring process were recorded in the logbook. Mentoring went on for one term (three months) duration . The mentor in each school demonstrated for their beginners, observed them in action and convened support meetings to discuss feedback. The number of encounters between the mentor and beginning teacher varied from one school to the other. The mentors however reported an average of twenty encounters for observation and coaching modeling. More encounters were however recorded for establishing the working relationship and individual consultation. The researcher also made an average of twelve visits to each school during the duration of mentoring treatment. During the visits, the researcher observed the mentoring

process in progress (demonstration, observation or the support meetings). The researcher also encouraged both the mentors and the beginning teachers to talk about their areas of concern.

Post- testing was carried out after three months or one school term. The post-test involved the administration of the STOS and the 15-item competence checklist on the experimental and control groups.

TABLE 3.7: TEACHER MENTORING PROGRAMME [TMP] TRAINING PACKAGE [MENTORING MODULAR INSTRUCTION APPROACH]

INTRODUCTION:- The beginning secondary school science teachers are expected to possess teaching competence that will in turn aid them in imparting science subject matter in ways that will stimulate students' interest in learning science to fit into this exciting modern age of science and technology.

This package is designed to aid the mentors in assisting the beginning science teachers in developing selected Ten competence for science Teaching in the secondary schools.

TERMINAL OBJECTIVES:- The mentor should be able to aid beginning teachers to develop and carry out the selected ten mentoring process successfully. Two Assessment instruments namely STOS and CSC are available for assessing the performance level of the beginning teachers in each process.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
1.	RELATIONSHIP WITH STUDENTS	The beginning teachers should be able to (a) initiate and maintain good relationship with individuals. (b) extend the relationship to the whole class (c) sustain the relationship consistently.	Items 9,10, 13 of CSC and items a,b,c,d,e of STOS	(a) how to show ability to secure attention from groups of varying size. (b) how to initiate and maintain good relationship with individuals and whole class. (c) how to seek to exercise control by encouragement and reception of ideas rather than by criticism and coercion. (d) How to encourage and praise.	items 9,10,13 of CSC and items a, b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
2.	SUBJECT KNOWLEDGE	The beginning teachers should be able to (a) present own subject knowledge in accessible form to students. (b) research topics in order to develop their subject knowledge.	Items 1,4,12 and 14 of CSC and items a,b,c,d,e of STOS	(a) how to possess research skills necessary to develop coherent subject knowledge base. (b) how to smoothen unevenness/gaps in subject knowledge.	Items 2,3,6 of R CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
3.	PLANNING	The beginning teachers should be able to (a) develop well balanced programme of activities for particular age and ability range (b) plan different method or procedures of teaching.	Items 2, 3, 6, of CSC and a,b,c,d,e of STOS	(a) how to plan whole lesson. (b) how to develop understanding of age and ability range (c) how to demonstrate for the beginning teacher different methods or procedures of teaching. (d) how to involve the beginning teacher in planning and directing learning activities of pupils. (e) How to check unit and daily plans of the beginning teacher.	Items 2, 3, 6, of CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
4.	CLASS MANAGEMENT	The beginning teacher should be able to (a) start and end lessons effectively (b) change and vary classroom activities. (c) Manage resources, materials and equipment effectively. (d) Monitor and motivate small groups and individuals interest in science. (e) Display different ways of establishing and maintaining control.	Items 3,4,6,9,10,13 and a,b,c,d,e of STOS	(a) how to make progress in managing groups of different sizes. (b) how to manage the beginning and end of lessons. (c) how to organise groups in classroom and laboratories. (d) how to make successful transitions from one activity to another. (e) how to make appropriate scientific materials and equipment available (f) how to improvise scientific materials and equipment.	R

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
5.	COMMUNICATIONS	The beginning teacher should be able to (a) use firm and clear speech (b) use vocabulary appropriately for pupils age and ability range. (c) Vary tone and voice (d) Make appropriate gestures (e) Developing good questioning technique.	Items 6,7,9,11,13 of CSC and a,b,c,d,e of STOS	(a) how to enhance speech articulation. (b) how to use appropriate and simple vocabulary with the right technical terms in each science subject area. (c) How to speak with clear voice and right pronunciation (d) How to express oneself clearly and firmly.	Items 6,7,9,11,13 of CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
6.	ASSESSMENT	The beginning teacher should be able to (a) assess pupils behaviour and responses (b) monitor pupils progress. (c) Keep records (d) Mark test and examination scripts correctly. (e) Use different form of assessment. (f) Use assessments to inform lesson planning and teaching.	Items 8,9,10,11 and 12 of CSC and a,b,c,d,e of STOS.	(a) how to evaluate the progress of the beginning teachers and the pupils. (b) how to keep a comprehensive record of the activities and progress of the beginning teacher and pupils. (c) How to use different forms of assessments. (d) How to relate assessments to teaching.	Items 8,9,10,11 and 12 of CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
7.	REFLECTING ON PRACTICE	The beginning teacher should be able to; (a) adapt schemes to meet children's responses and needs (b) respond to advice. (c) Perceptive in evaluating own teaching. (d) Analyse teaching and observations.	Items 2,3,4,5,6,9,10,13 and 15 of CSC and a,b,c,d,e of STOS	(a) how to reflect on practice through preparation shown in a well presented and carefully arranged record (a) how to make careful selection of content strategies and materials. (b) How to analyse teaching and observation in more structured and systematic manner. (c) How to evaluate more thoughtfully. (d) How to listen, analyse and respond actively to given advice. (e) how to use owns initiative when need to change practice arises.	Items 2,3,4,5,6,9,10,13 and 15 of CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
8.	PROFESSIONALISM	The beginning teacher should be able to: (a) develop rapport with colleagues (b) maintain and sustain rapport with other teachers. (c) Contribute to wider activities outside the classroom (e.g during staff PTA etc). (d) Contribute to pastoral and extra-curricula activities.	Items 4,5,6,7,9 and 15 CSC and a,b,c,d,e of STOS	(a) how to relate to other teachers to enhance cordial relationship. (b) how to contribute to wider activities in the school (c) how to gain exposure in ones field by attending relevant professional subject associations(e.g. STAN ,MAN etc). Workshop, conferences. (d) how to participate actively on extra curricular activities sponsored by school and community. (e) Participate actively in seminars and in-service training for staff.	Items 4,5,6,7,9 and 15 CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
9.	PERSONAL QUALITIES	The beginning teacher should be able to; show some of the cherished personal qualities [such as: rapport, sensitivity, reliability, enthusiasm, confidence, open mindedness, flexibility and a sense of humour essential to make the good teacher and present a good teacher and present a good image in the school.	Items 1,4,6,9,10,13 and 15 of CSC and a,b,c,d,e of STOS	(a) how to present a positve and enthusiastic image in the school. (b) how to develop personal qualities desirable in a teacher.	Items 1,4,6,9,10,13 and 15 of CSC and a,b,c,d,e of STOS.

	COMPETENCIES DEVELOPED	ENABLING OBJECTIVES	PRE-ASSESSMENT	INSTRUCTIONAL PROCEDURES	POST ASSESSMENT
10.	OBSERVATION	The beginning teacher should be able to (a) observe the mentor and science teachers lessons. (b) Analyse the observed lessons into detail. (c) Demonstrate competent science teaching for the mentor (d) Participate actively in scheduled supports meetings with the mentor and colleagues.	Items 2,6,8,9,12,13 and a,b,c,d,e and of STOS	(a) Arrange for beginning teacher to observe other teachers classroom (b) demonstrate for the beginning teacher different methods of teaching (c) develop well balanced programme of teaching activities for the beginning teacher (d) Arrange support meetings or conferences for obtaining feedback from demonstrations, observations and coaching.	Items 2,6,8,9,12,13 and a,b,c,d,e and of STOS.

Notes: The teacher is free to use relevant materials and reference books for each of the science subjects.

3.10 RESULTS OF THE PILOT STUDY

The pilot study included eighty science teachers and eight principals in eight schools of four Local Education District [LED] of Lagos State.

3.10.1 (A) Administration of Questionnaire (TCQ)

The Teacher classification Questionnaire (TCQ) was administered to all the science teachers in the eight secondary schools selected.

Responses were obtained from fifty-three of the eighty subjects sampled. Analysis of the questionnaire TCQ revealed the following:-

a) More than half of the respondents were within the 30 – 40 years bracket.

b) Close to 40% were untrained teachers.

c) Thirty-two (60.4%) of the fifty-three respondents were beginning teachers.

d) Inspection by State Inspectorate Officials were few, far in between and none in existence in some cases.

e) Many, that is, 67.44% of the respondents claimed they derive enjoyment from teaching but confessed they would rather be in another employment with better take-home package.

f) More than half, (34) claimed they hold departmental meetings only when the need arises.

g) More than three-quarter, (41) indicated interest in consulting an experienced colleague when faced with difficulty.

h) The overall results obtained from the questionnaire (TCQ) analysis revealed the presence of so many untrained teachers in the field and also that

beginners out-number the experienced ones in most schools sampled for the pilot study. This alone, is an indication of high attrition rate among the teachers that portrays danger for the educational system.

3.10.2 Questionnaires QHODPBT and QPPBT

The questionnaires QHODPBT and QPPBT were also administered to eight principals and eight heads of science department of the selected eight schools for pilot study.

The principals and heads of department were unanimous in their opinion that:-

a) The beginners have so many things to learn to be able to integrate theory with practice.

b) The beginning teachers spend half of the lesson period in disciplining the students rather than teaching content.

c) Many of the Principals and HODS were nostalgic about the "good old days" they referred to as when "pre-service teachers were properly prepared"

Only three of the eight principals were science graduates while others were graduates of non-science related subjects. Thus one expects a biased report as they could report only certain portion of the beginners performance. For example they could not say much on the knowledge of subject matter, classroom teaching activities etc. where knowledge of science were referred to by the beginners.

The analysis of QHODPBT and QPPBT also revealed that the principals and HODS were somehow too idealistic in their perception of the beginning teachers. This, may probably be due to constant comparison of preparation of teachers in yester-years and what obtains today. To reduce the effect of this bias on the part of the principals and HODS, the vice-principals were included in the main study.

3.10.3(B) Administration of Interview Schedule

The thirty-two identified beginning teachers were further interviewed using the beginning teacher interview schedule (BTIS). The summary of the findings are as follows:

a) Most of the beginning teachers complained that many of the experienced teachers look 'down' on them, just waiting for them (beginners) to make mistakes and are arrogant too. The fairly older ones among the beginners failed to see the need for them to interact with experienced teachers younger than themselves.

b) Most of the beginning teachers interviewed rated classroom discipline, administrative tasks (for example filing anecdotal records), availability of material resources, decision about teaching methods and identifying characteristics of good teaching as important areas of concern.

c) One of the beginning teachers, a lady, felt discipline should be rated as the most difficult in her own words as follows

At first discipline was the biggest perceived problem. It was quite frustrating at not being able to run a quiet classroom and very surprised that the pupils were not fallen at my feet to learn. I had to really put a lot of energy into disciplining them before I could teach content. This made me feel rather inadequate and unsuccessful.

d) Most of the beginning teachers interviewed agreed on the fact that teaching is a highly demanding job if one adheres strictly to the professional ethics. Many of the beginners also revealed that entrants to the teaching profession are bound to face attendants stress, fears and reservations associated with entrance into a new job.

3.10.4 Observation of Teachers

The science Teachers observation schedule (STOS) and the 15 – item CSC was used to observe the eighty subjects in eight schools sampled for the pilot study before and after TMP administration.

The highlights of the results are as follows:

a) Prior to mentoring, there was no significant difference in the teaching competence of the experimental and control group [$t = 0.59$; $df = 14$; $p > 0.05$]

b) Whereas significant difference exists in the teaching competence of the two groups after exposure of experimental group to mentoring [experimental, $t = 2.03$; $df = 14$; $p < 0.05$] while for control $t = 0.53$; $df = 14$; $p > 0.05$. Therefore the mentored teachers displayed superior teaching competence compared to the control group that

was not mentored. The full analysis of pre and post-test is presented in appendix G^{1-2}.

c) The pair-wise comparison of professional and non-Professional teachers showed that the teaching competence of both groups improved with TMP treatment. The trained teachers ($t = 2.11$; $df = 14$; $P < 0.05$)

The full analysis of pre and post-test is presented in appendix H^{1-2}

d) Again it was discovered that all mentored teachers benefit from mentoring irrespective of initial qualification attained (NCE – $t = 1.42$; $df = 5$, $p > 0.05$, University graduate $t = 1.15$; $df = 3$; $p > 0.05$; Polytechnic graduate – $t = 1.10$, $df = 2$; $p > 0.05$). Thus no significant difference was revealed in the teaching competence of the three groups on the basis of educational qualification.

e) On investigating the above position further using one-way Anova test, no significant difference was revealed between and within the three groups. ($F = 0.68$; $df = 2/14$; $p > 0.05$).

Detailed scores of the teachers mentored on the basis of qualification are presented in appendix N^{1-3}

CHAPTER FOUR

RESULTS AND DISCUSSION OF THE MAIN STUDY

4.0 INTRODUCTION

This chapter presents a summary of the analysis of data gathered, with reference to each research question and hypothesis stated in chapter one.

The issues addressed are the following;

(a) analysis of the personal data (against which background questions and hypotheses are to be answered).

(b) answer to the research questions

(c) hypotheses testing

(2) Summary of outcomes

(3) Discussion of outcomes

4.1 RESPONDENTS' BIOGRAPHICAL DATA

The questionnaire TCQ was used in classifying the subjects. The questionnaire was administered to all the four hundred teachers of the twenty schools sampled. Three hundred and ten, (77.5%) respondents returned the questionnaire.

The data on the personal characteristics of the 310 Teacher-respondents are presented in table 4.1a to 4.1f while the pictorial descriptions are presented in graph 4.1 to 4.19.

The summary description of personal data on age, gender, marital status and responsibilities in the school are presented in table 4.1b and graph 4.1 to 4.4. The

data on respondents' qualification and teaching experience are presented in table 4.1b and graph 4.5 and 4.6. Table 4.1c and graph 4.7 to 4.9 show the data on respondents subject specialisation, subject taught and Principals' subject specialisation. The respondents' data on Vice-Principals' subject specialisation, Frequency of state inspectors' visits and subject supervision by state officials are provided in table 4.1d and graph 4.10 to 4.13.

Table 4.1e and graph 4.13 – 4.18 show the data on respondents' lesson notes inspection, initial induction training, preference for other jobs, lesson preparation and attitude to consultation with experienced colleagues. The frequency of departmental or meeting is provided in table 4.1f and graph 4.19.

TABLE 4.1a SUMMARY DESCRIPTION OF RESPONDENTS' BIOGRAPHICAL DATA ON AGE, GENDER, MARITAL STATUS AND SUBJECTS' RESPONSIBILITIES VARIABLE

RESPONDENTS	AGE								GENDER				MARITAL STATUS				RESPONSIBILITIES													
	1		2		3		4		1		2		1		2		1		2		3		4		5		6		7	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
	84	27.14	144	46.45	42	13.55	39	12.86	148	47.74	162	52.26	121	42.76	162	57.24	20	6.16	6	1.99	9	2.90	12	3.81	7	3.87	4	2.26	243	78..39

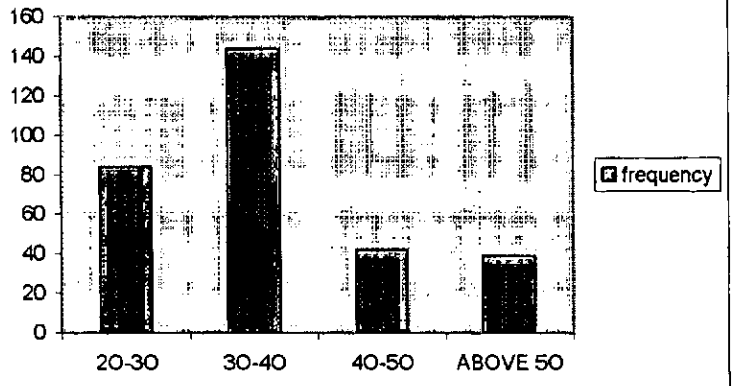
1. 20-30 YEARS
2. 30-40 YEARS
3. 40-50 YEARS
4. ABOVE 50 YEARS

1. MALE
2. FEMALE

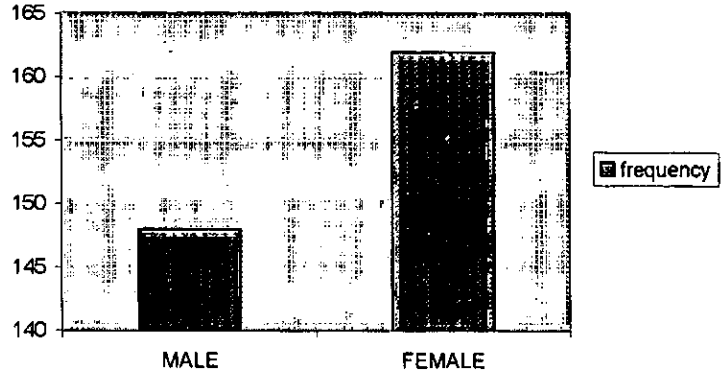
1. SINGLE
2. MARRIED

1 = HEAD OF SCIENCE DEPT.
2 = HEAD OF PHYSICS UNIT
3 = HEAD OF CHEMISTRY UNIT
4 = HEAD OF BIOLOGY UNIT.
5 = HEAD OF MATHEMATICS UNIT
6 = HEAD OF AGRICULTURAL UNIT
7 = SUBJECT TEACHER

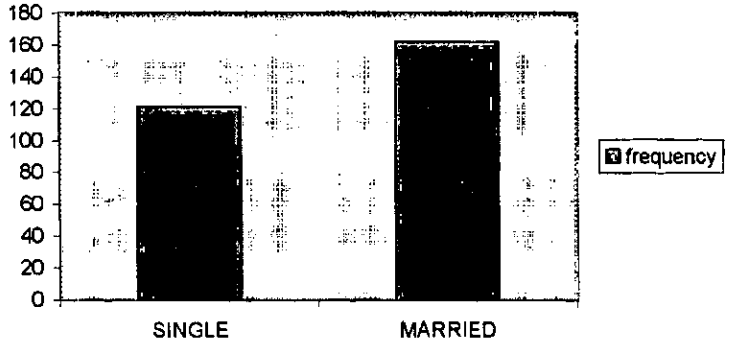
Graph 4.1: Description of respondents' biographical data on age



Graph 4.2: Description of the respondents' biographical data on gender



Graph 4.3:Description of respondents' biograpical data on marital status



Graph 4.4:Description of respondents' biographical data on subject responsibilities

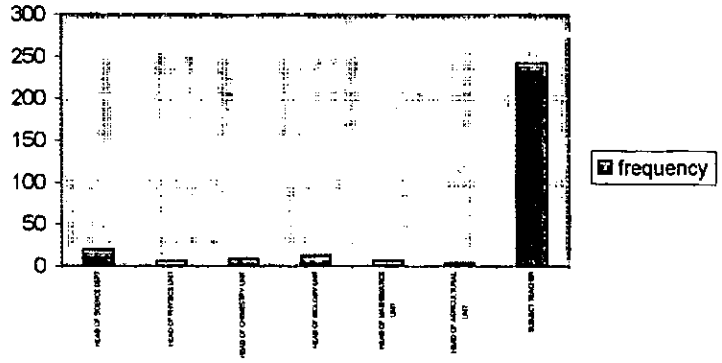


TABLE 4.1b SUMMARY DESCRIPTION OF RESPONDENTS' BIOGRAPHICAL DATA

RESPONDENTS	ACADEMIC QUALIFICATION																TEACHING EXPERIENCE											
	1		2		3		4		5		6		7		8		1		2		3		4		5		6	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
	78	25.16	67	21.61	51	16.45	42	12.55	35	11.29	18	5.82	8	2.58	5	1.61	98	31.61	48	15.48	67	21.61	52	16.78	19	6.13	26	8.39

1 = N. C. E.

2 = B.Sc. (Hons)

3 = B.Sc. (Educ)

4 = B. Ed

5 = HND

6 = OND

8 = B.Sc (Hons) + PGDE

9 = Others

1 = 0 – 2

2 = 3 – 5

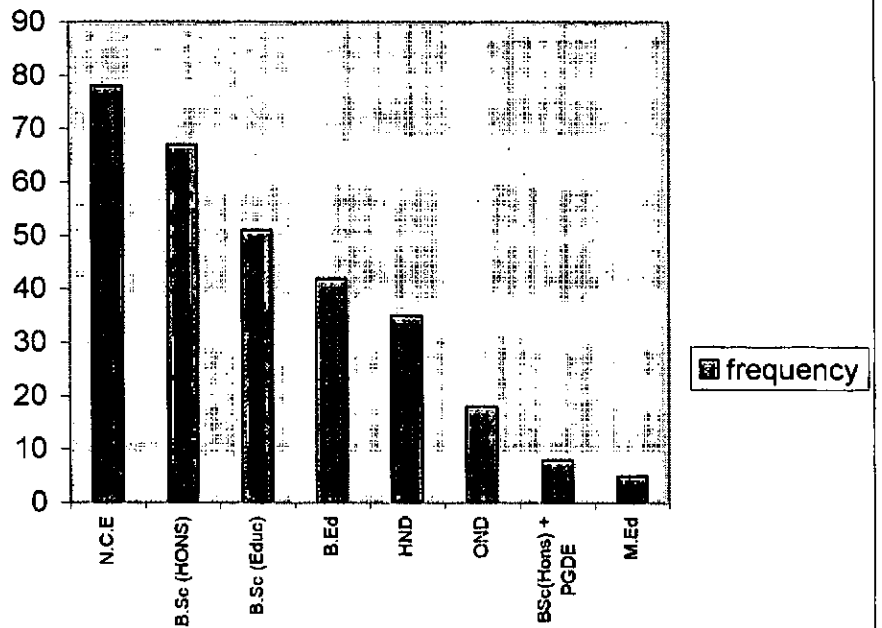
3 = 6 – 10

4 = 11 – 15

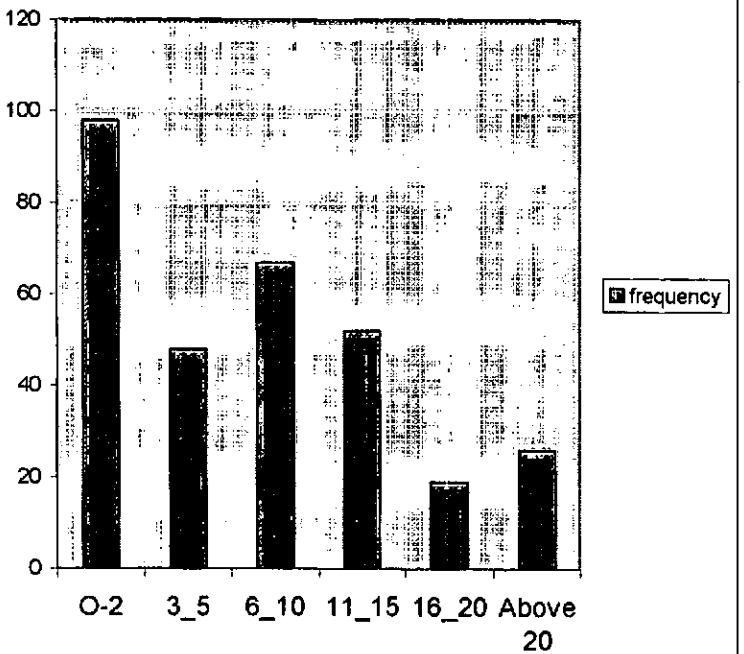
5 = 16 – 20

6 = Above 20

Graph 4.5: Description of respondents' biographical data on academic qualification



Graph 4.6:Description of respondents' biographical data teaching experience



Following are highlights from the tables respectively;

(a) Figures in table 4.1a reveal that almost half (46.45%) of the respondents were within 30-40 years bracket. There were few (12.86%) elderly ones in the sample. The analysis also revealed the preponderance of female teachers (52.26%) over male teachers. Again more than half (57.24%) of the respondents were married

(b) The figures in table 4.1a also indicate that all the twenty schools sampled had Heads of Science department while only few had the science department split into their component units. Most of the teacher (78.39%) sampled were subject teachers handling different subjects while few were heads of department and units.

(c) Table 4.1(b) reveals that 183 (59.03%) of the respondents were trained and certificated teachers. One hundred and twenty-seven (40.65%) were untrained teachers. These were referred to in this study as non-professionals. This (non-Professional) refers to those that have never seen the four walls of a teacher training college. The response shows that there are still many untrained teachers operating in the school system contrary to the National Policy on Education (NPE) that stipulates a minimum of N.C.E as entry qualification into the teaching profession. The NPE therefore regards an untrained teacher as an auxiliary who should not be in the classroom teaching.

(d) Again the figures in table 4.1b reveal that 146 (47.1%) of the respondents were beginning teachers in keeping with Doyle's (1988) study which stated that it will take five years for a neophyte teacher to "partially learn the rope".

The 146 respondents identified as beginning teachers were 47.09% of the total sample. This shows that almost half of the respondents were inexperienced teachers. Sixty-seven of the respondents (21.61%) were grouped as semi-veterans while ninety-seven were regarded as master-teachers or veterans.

TABLE 4.1c SUMMARY DESCRIPTION OF RESPONDENTS' BIOGRAPHICAL DATA

SUBJECT SPECIALISATION												SUBJECT TAUGHT												PRINCIPALS SUBJECT SPECIALISATION											
1		2		3		4		5		6		1		2		3		4		5		6		1		2		3		4		5		6	
NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
32	10.32	73	23.55	59	19.03	24	7.74	76	24.52	46	14.64	65	18.79	88	25.43	47	13.58	28	8.09	82	23.70	36	10.41	-	0.0	3	0.97	3	0.97	-	0.0	3	0.97	2	0.65

1 = INTEGRATED SCIENCE

2 = BIOLOGY

3 = CHEMISTRY

4 = PHYSICS

5 = MATHEMATICS

6 = AGRICULTURSAL SCIENCE

1 = INTEGRATED SCIENCE

2 = BIOLOGY

3 = CHEMISTRY

4 = PHYSICS

5 = MATHEMATICS

6 = AGRICULTURAL SCIENCE

1 = INTEGRATED SCIENCE

2 = BIOLOGY

3 = CHEMISTRY

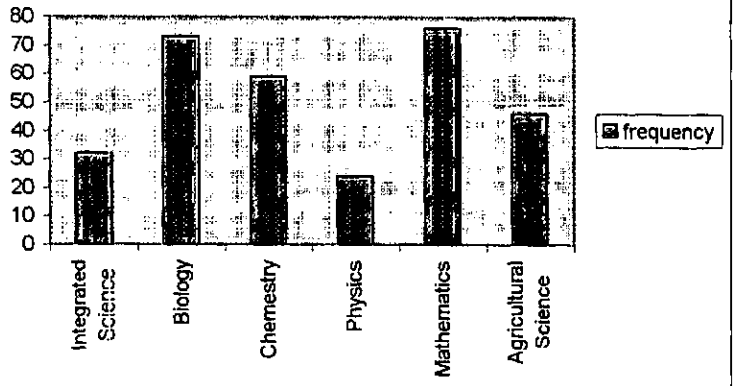
4 = PHYSICS

5 = MATHEMATICS

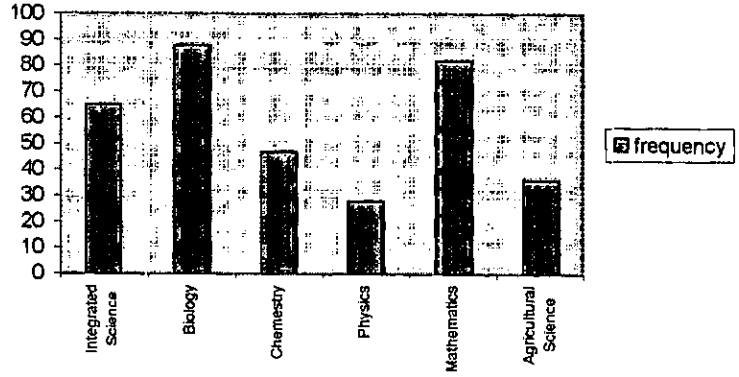
6 = AGRICULTURAL SCIENCE

7 = OTHERS (ARTS, SOCIAL SCIENCE ETC.

Graph 4.7: Description of respondents' biographical data subject specialisation



Graph 4.8: Description of respondents' biographical data on subject target



Graph 4.9:Description of respondents' biographical data on principal subject specialisation

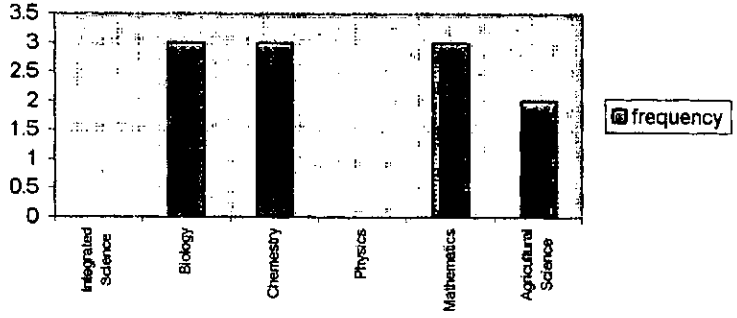
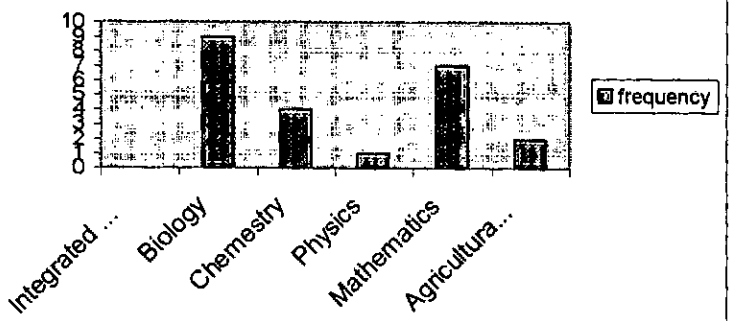


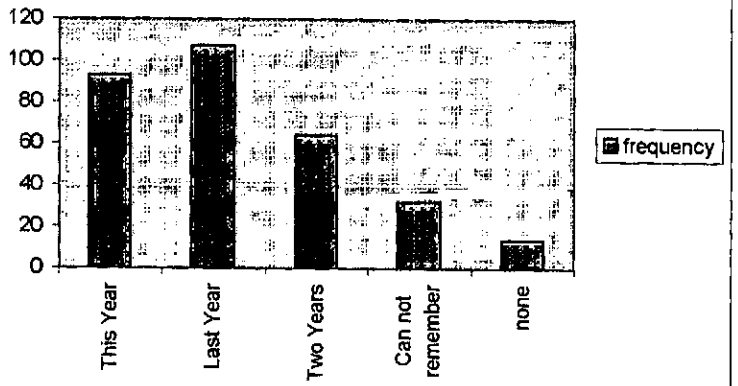
TABLE 41d SUMMARY DESCRIPTION OF RESPONDENTS' BIOGRAPHICAL DATA

VICE-PRINCIPAL SUBJECT SPECIALISATION												INSPECTION BY STATE OFFICIALS										SUBJECT SUPERVISION BY STATE OFFICIAL			
1		2		3		4		5		6		1		2		3		4		5		1		2	
NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
-	0.0	9	28.13	4	12.5	1	3.13	7	21.88	2	6.25	93	30.0	107	34.52	64	20.65	32	10.32	14	4.52	231	82.80	48	17.20
1 = INTEGRATED SCIENCE 2 = BIOLOGY 3 = CHEMISTRY 4 = PHYSICS 5 = MATHEMATICS 6 = AGRICULTURAL SCIENCE 7 = OTHERS (ARTS, SOCIAL SCIENCES)												1 = THIS YEAR 2 = LAST YEAR 3 = TWO YEARS 4 = CAN NOT REMEMBER 5 = NONE										1 = SUBJECT SPECIALIST 2 = NON-SUBJECT SPECIALIST.			

Graph 4.10: Description of respondents' biographical data on vice-principal subject specialisation



Graph 4.11: Description of respondents' biographical data on inspection by state official.



Graph 4.12: Description of respondents' biographical data on subject supervision by state officials.

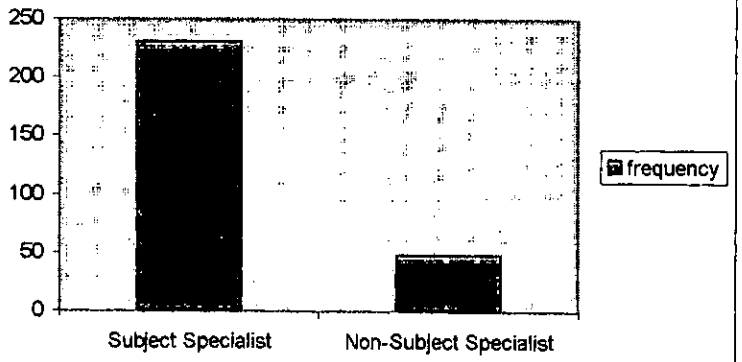
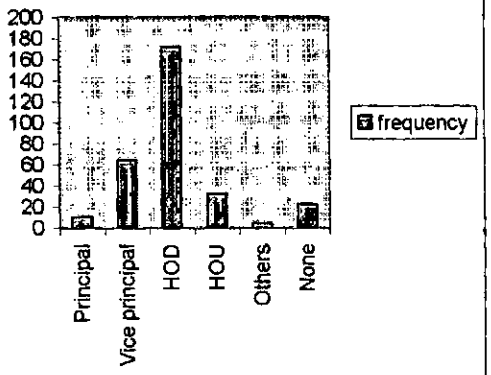


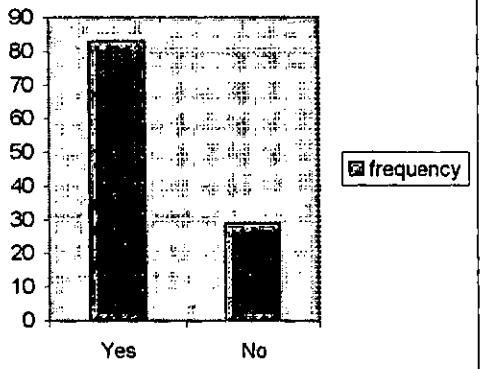
TABLE 4 1e SUMMARY DESCRIPTION OF RESPONDENTS BIOGRAPHICAL DATA

NOTES OF LESSON INSPECTION												INITIAL INDUCTION TRAINING				PREFER ANOTHER JOB				ENJOY TEACHING				LESSON PREPARATION			
1		2		3		4		5		6		1		2		1		2		1		2		1		2	
NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
11	3.55	65	21.29	172	55.48	33	10.65	5	1.61	23	7.42	83	27.48	219	72.52	231	75.74	74	24.26	98	32.13	207	67.87	252	87.5	36	12.5
1 = PRINCIPAL 2 = VICE-PRINCIPAL 3 = HOD 4 = HOU 5 = OTHERS 6 = NONE												1 = YES 2 = NO				1 = YES 2 = NO				1 = YES 2 = NO				1 = YES 2 = NO			

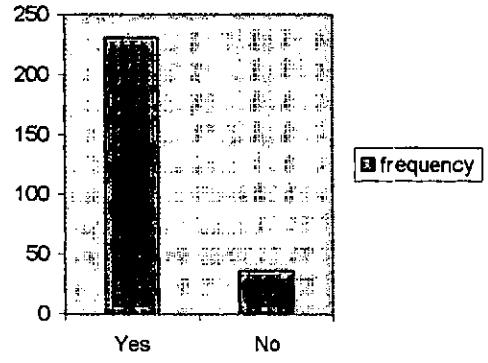
Graph 4.13:Description of respondents' biographical data on notes of lesson inspection



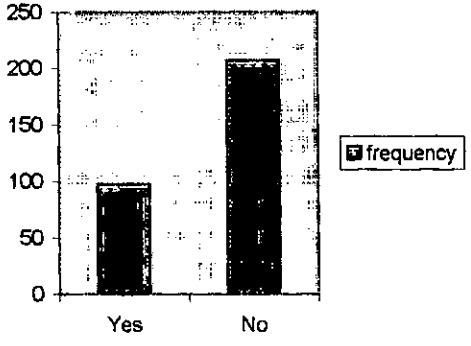
Graph.4.14:Description of respondents' biographical data on initial induction training



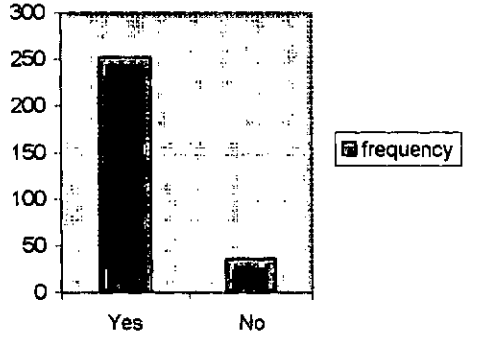
Graph.4.15:Description of respondents' biographical data on preference for another job



Graph.4.16: Description of respondents' biographical data on teaching enjoyment



Graph 4.17: Description of respondents' biographical data on lesson preparation



Graph 4.18: Description of respondents' biographical data on consultation with experienced colleagues

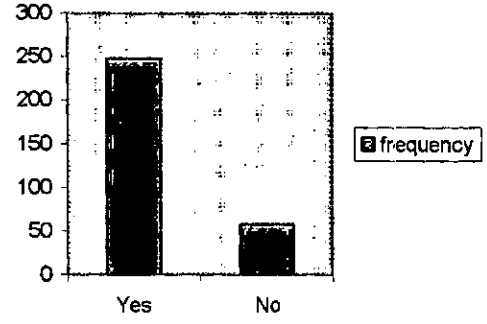
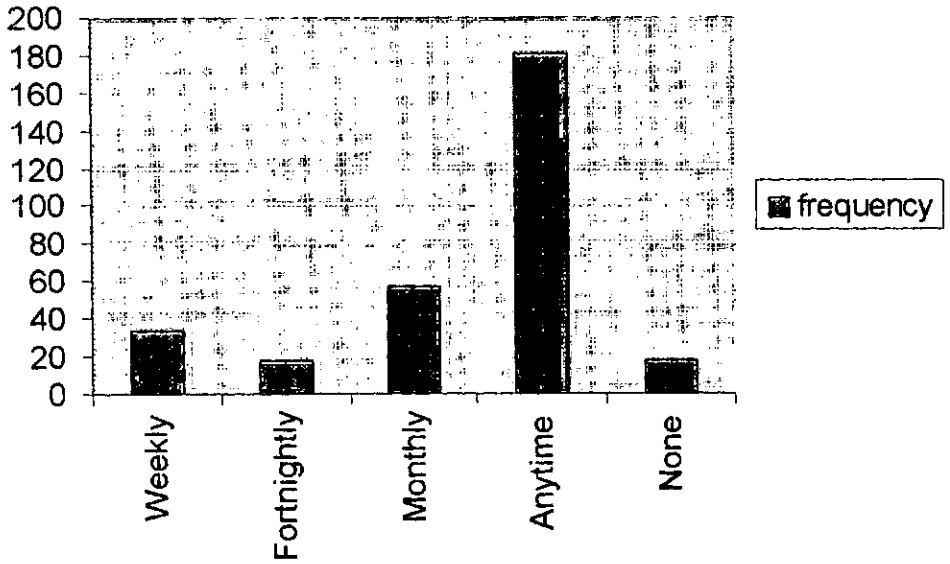


TABLE 4.1f SUMMARY OF RESPONDENTS' BIOGRAPHICAL DATA

DEPARTMENTAL OF UNIT MEETING FREQUENCY										CONSULTATION WITH EXPERIENCED COLLEAGUES			
1		2		3		4		5		1		2	
NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
34	11.04	18	5.64	57	18.41	181	58.77	18	5.84	248	81.58	58	18.42
1 = WEEKLY 2 = FORTNIGHTLY 3 = MONTHLY 4 = ANYTIME 5 = NONE										1 = YES 2 = NO			

Graph 4.19:Description of respondents' biographical data on departmental or unit meeting frequency



(e) Table 4.1c shows respondents area of specialisation and subject taught. It revealed that thirty-two (10.32%) had their training in Integrated Science, a compulsory Science subject for all junior secondary school (JSS) classes. Only twenty-four (7.74%) of the respondents had their training in physics while Mathematics and Biology more than any of the other subjects had high number of respondents. This is likely to be due to the fact that both subjects are compulsory for the Senior Secondary School (SSS) classes.

Again table 4.1c reveals the fact that many of the teachers were teaching subject area for which they were not trained. Only thirty-two (10.32%) were trained Integrated Science teachers while 65 (18.79%) were teaching the subject.

(f) Table 4.1c also reveals that many of the principals were not Science graduates. For example, eleven (55%) of the principals sampled were trained in non-Science related subject. Only nine of the thirty-two vice-principals sampled were non-Science graduates.

(g) Table 4.1d reveals the fact that visits by State Officials from the inspectorate were few and far between. In fact only 93 (30.0%) respondents were supervised during the 1995/96 academic year while 107 (34.52%) and 64 (20.65%) had been supervised in the last two and one year respectively.

The table 4.1d shows that the State Officials inspect the teachers on subject specialisation basis during their few visits to schools as only 48 (17.20%) respondents claimed to have been supervised by non-subject specialists.

(h) Whereas, table 4.1e indicates that almost all the respondents, that is 287 (92.58%) had their notes of lesson inspected by superior Officers.

The questionnaire analysis revealed that some of the respondents had their lesson note/plan inspected by those that were not supposed to inspect them. Some Principals and Vice-principals that inspected the notes of lesson were graduates of non-Science related subjects In fact 23 (7.24%) of the respondents claimed that their notes of lesson were never inspected by anybody.

(i) The table 4.1e shows that more than three-quarters (87.5%) of the respondents write notes of lesson as against 36 (12.5%) that do not write. Almost all of them complained of drudgery of writing notes of lesson.

(j) From the figures in table 4.1e, only 83 (27.48%) respondents went through an initial induction course on entry into the teaching profession. More than two thirds (72.52%) of the respondents were not given any initial induction training on entry into the service.

(k) From figures in table 4.1e, ninety-eight (32.18%) respondents claimed they enjoy teaching while two-hundred and seven (67.87%) claimed they do not enjoy teaching but are in it as they needed to earn their living. In fact, precisely two-hundred and thirty-one (75.75%) respondents were identified as reluctant teachers as they signified preference for another type of employment, even though some of them claimed they derive enjoyment from teaching.

(l) Whereas table 4.1f shows that departmental or unit meetings were seldom held as one hundred and eighty-one (58.7%) respondents reported that they hold meetings anytime, that is, only when the need arises. The departmental or unit meetings are supposed to hold at regular intervals to tackle issues of teaching and learning. About one-third (35.3%) claimed they hold meetings at regular intervals.

(m) Table 4.1f reveals that almost all, that is 248 (81.58%) respondents indicated interest in consulting with experienced colleagues when faced with difficulty. Only 56 (18.42%) of the respondents felt they did not need the help of their experienced colleagues. Thus, most of the subjects felt the need for support in their classroom teaching.

4.1.1 The Questionnaires on Perception of Status of Beginning Teachers – QHODPBT and QPPBT

The questionnaire on perception of status of beginning teachers administered on principals, vice-principals and heads of department when analysed revealed the following in rank order:

(a) Some beginning teachers appear qualified on paper but have minimal preparation. For instance a life science teacher assigned to teach earth science would definitely be deficient in pedagogical knowledge (30.91%).

(b) Many of the beginning teachers have problem with lesson planning ((32.73%).

(c) Almost all beginning teachers have problem in classroom organisation and discipline. They often see themselves more as authority figures or disciplinarians rather than managers of classroom life (38.18%).

(d) Most are deficient in maintaining consistent accountability procedures for all students' learning (42.73%).

(e) Most have idealistic view of students individual differences (44.55%).

(f) Some lack self-confidence. They become nervous when a senior colleague sits in the class. They prefer the norm of a closed classroom (48.18%).

(g) Many of the beginning teachers see themselves as birds of passage bidding their time for a better paid job (53.64%).

(h) Most of the HODS, Vice-principals and principals were of the opinion that the beginning teachers must be adequately supported professionally in their first years of practice (60.91%).

(i) The HODs, Vice-principals and principals' perception of status of beginning teachers corroborated Magliaro, Wildman, Niles and Mclaughin (1992) and Wildman, Niles, Magliaro and MCLaughlin (1989) studies that stated classroom management, unfamiliar content areas and paper work as major problems of beginners.

4.2 The Interview Guide (BTIS)

a) The one hundred and forty-six identified beginning teachers from TCQ were interviewed using the BTIS. All teachers within one to five years were classified as beginners (Doyle 1988).

b) Most of the beginning teachers (72.5%) claimed that their "short while" as a teacher was easy but complained of drudgery of writing lesson notes.

c) More than half complained that they were stressed at school and this in turn has a negative impact on their private life.

d) Half of those sampled argued that of all the stated areas that other teachers have identified as problems, the most difficult ones are: identifying characteristics of good teaching, making decisions about teaching methods availability of materials/resources and classroom discipline.

e) Again (as revealed in TCQ) almost al the beginning teachers interviewed desire good rapport and collegial support from experienced colleagues.

f) Some of the beginning teachers complained that the experienced master teachers hold them in contempt.

g) Extensive interview and interactions with the beginning teachers revealed that many of them feel isolated most times and lack appropriate support.

h) The researcher also observed that the beginning teachers' complaints of being stressed was likely to be as a result of fitting in to a new world of work with all its initial demands and uncertainty as also corroborated by Veeman, (1984).

4.3 THE RESEARCH QUESTIONS

4.3.1 Research Question 1

Does Teacher Mentoring Programme (TMP) have effect on teaching competence of Beginning Teachers Mentored?

Research question 1 addresses the effect of TMP (whether positive or negative) on teaching competence of beginning teachers.

The pre-test (before mentoring) and post-test (after mentoring) scores of the mentored teachers were analysed to examine the effect of TMP administration on their teaching competence. An analysis of covariance (ANCOVA) test was employed with the pre-test scores as covariates.

This is to obtain the main effect of mentoring on beginners' teaching competence. The result is presented in tables 4.2a – 4.2b.

TABLE 4.2a: ANALYSIS OF COVARIANCE (ANOVA) RESULT OF THE EFFECTS OF TMP ON TEACHING COMPETENCE OF BEGINNING TEACHERS MENTORED BY TRAINING.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	P(0.05)
Covariates	2.876	1	2.876	.509	.484
Pre-Test	2.876	1	2.876	.509	.484
Main Effects	449.166	2	224.583	54.247	.000
Mentoring	446.513	1	446.513	107.852	.000
Training	2.654	1	2.654	.641	.426
2-way Interactions	2.078	1	2.078	.502	.481
Mentoring/Training	2.078	1	2.078	.502	.481
Explained	451.245	3	150.415	36.332	.000
Residual	314.643	76	4.140	36	
Total	765.888	79	9.695		

The figures on table 4.2a show that the F-ratio for main effect of mentoring on teaching competence of beginning teachers due to training was substantially significant. Again when the main effect of mentoring due to other variables (experience, qualification, and gender) was examined. It was discovered that all the

P-values are very small and less than 10^{-3} which is an indication of very high significant effect of mentoring. This also indicates that mentoring affect the teaching competence of the teachers mentored positively. The results are presented in table 4.2b – 4.2d.

TABLE 4.2b: ANALYSIS OF COVARIANCE (ANCOVA) RESULT OF TMP ON TEACHING COMPETENCE OF BEGINNING TEACHERS MENTORED BY EXPERIENCE.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	P (0.05)
Coveriated	2.876	1	2.876	.509	.484
Pre-Test	2.876	1	2.876	.509	.484
Main Effects	457.156	3	152.385	36.592	.000
Mentoring	446.513	1	446.513	107.219	.000
Experience	10.644	2	5.322	1.278	.285
2-way Interactions	.559	2	.280	.067	.935
Mentoring/Experience	.559	2	.280	.067	.935
Explained	457.716	5	91.543	21.982	.000
Residual	308.172	74	4.164		
Total	765.888	79	9.695		

TABLE 4.2c: ANALYSIS OF COVARIANCE (ANCOVA) RESULT OF THE EFFECTS OF TMP ON TEACHING COMPETENCE OF BEGINNING TEACHERS MENTORED BY QUALIFICATION.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	P (0.05)
Covariates	2.876	1	2.876	.509	.484
Pre-Test	2.876	1	2.876	.509	.484
Main Effects	454.962	3	151.654	37.019	.000
Mentoring	446.513	1	446.513	108.993	.000
Qualification	8.450	2	4.225	1.031	.362
2-way Interactions	7.769	2	3.884	.948	.392
Mentoring/Qualification	7.769	2	3.884	.948	.392
Explained	462.731	5	92.546	22.590	.000
Residual	303.156	74	4.097		
Total	765	79	9.695		

TABLE 4.2d: ANALYSIS OF COVARIANCE (ANCOVA) RESULT OF THE EFFECTS OF TMP ON TEACHING COMPETENCE OF BEGINNING TEACHERS MENTORED BY GENDER

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	P (0.05)
Covariates	2.876	1	2.876	.509	.484
Pre-Test	2.876	1	2.876	.509	.484
Main Effects	453.545	2	226.772	55.348	.000
Mentoring	446.513	1	446.513	108.980	.000
Gender	7.032	1	7.32	1.716	.194
2-way Interactions	.957	1	.957	.234	.630
Mentoring/Gender	.957	1	.957	.234	.630
Explained	454.501	3	151.500	36.977	.000
Residual	311.386	76	4.097		
Total	765.888	79	9.695		

The related Multiple Classification Analysis (MCA) of the ANCOVA test on research question 1 yielded additional information. The result is presented in table 4.2e.

TABLE 4.2e: MULTIPLE CLASSIFICATION ANALYSIS (MCA) OF SIGNIFICANT ANCOVA RESULTS ON EFFECT OF TMP ON THE TEACHING COMPETENCE OF BEGINNING TEACHERS

Grand Mean = 8.46

		N	Unadjusted Variation	Eta	Adjusted for Independent Deviation	Beta
MENTORING	1. Pre-test	40	-2.36	.76	-2.36	.76
	2. Post-test	40	2.36		2.36	
TRAINING	1. Professional	52	.13	.06	.13	.06
	2. Non-Professional	28	-.25		-.25	
Multiple R Squared = .586						
Multiple R = .766						
EXPERIENCE	1) 1st Year	38	.35	.12	.35	.12
	2) 2nd Year	30	-.20		- .20	
	3) 3rd Year	12	- .63		- .63	
Multiple R Squared = .597						
Multiple R = .773						
GENDER	1. Male	34	- .34	.10	- .34	.10
	2. Female	46	25		.25	
Multiple R Squared = .592						
Multiple R = .770						
QUALIFICATION	1) NCE	38	.30	.11	.30	.11
	2) UNIVERSITY	24	- .09		- .09	
	3) POLYTECHNIC	18	- .52		- .52	
Multiple R Squared = .594						
Multiple R = .771						

From the MCA results displayed in table 4.2b it can be seen that experience had the highest mean teaching competence. The first year teachers had the highest unadjusted deviation mean (0.35)

Furthermore the N.C.E. teachers recorded high mean (.30) that is second only to first year teachers. This may be due to the fact that all the N.C.E. teachers are trained teachers. Again there were 38 N.C.E. teachers and 38 First Year Teachers in the sample.

Interestingly the female teachers had a higher mean (.25) than the male (-.34) while the professionals (.13) mean was higher than that of non-professionals (-.25)

The lowest means for teaching competence were recorded for third year Teachers (-.63) and Polytechnic teachers (- 52)

4.3.2 Research Question 2

Will TMP equally influence the teaching competence of professional and non-professional teachers mentored?

The mean and standard deviation of 26 trained and 14 untrained teachers were computed prior to and after TMP treatment. This is to examine the extent of improvement of both groups in teaching competence based on TMP

Pre and Post treatment scores were compared by t-test as presented in table 4.3

TABLE 4.3: PAIR-WISE COMPARISON OF EQUALITY IN THE TEACHING COMPETENCE OF TEACHERS IN TMP PRE AND POST – TEST

VARIABLES	n	d	$\bar{sd}$	t	P(0.05)
PRE-TEST ONLY					
Professional	26	6.19	1.72		1.706
Non Professional	14	5.93	1.69	0.32	1.761
POST-TEST ONLY					
PROFESSIONAL	26	10.88	2.72		1.706
NON-PROFESSIONAL	14	10.42	1.72	0.964	1.761
POST-PRE PROFESSIONAL	Post 26	4.85	2.87	2.92	1.706
	Pre 26	6.19	1.72		1.706
NON-PROFESSIONAL	Post 14	4.3	2.63	2.12	1.761
	Pre 14	5.93	1.69		1.761

The table 4.3 above reveals that the mean of professional teachers (6.19) is slightly higher than that of the non-professionals (5.93) prior to the TMP treatment. The t-value for both is not significant ($t = 0.32$; $df = 38$; $p > 0.05$). This shows that the two groups were equivalent prior to TMP treatment.

After TMP treatment of both groups the two mean values increased appreciably at 10.88 and 10.42 respectively compared to the pre-test situation. The t-value for post-test yielded $t = 0.964$; $p > 0.05$. This indicates that both groups displayed improved teaching competence due to TMP treatment but the difference between the groups is not significant.

Again the gain difference for professional (4.85) is higher than that of non-professional (4.3) The t-value of professionals ($t = 2.92$; $df = 24$; $p < 0.05$) is higher than that of non-professional ($t = 2.12$; $df = 12$; $p < 0.05$). This shows that TMP treatment influenced the teaching competence of the two groups but not equally. The professionals (trained teachers) displayed superior teaching competence compared to the non-professionals (untrained teachers).

The two groups of teachers benefited immensely from the TMP but the trained teachers were able to out-perform the untrained ones as they (trained teachers) had already acquired 'expert knowledge' required by the teaching profession which TMP helped to sharpen.

4.3.3. Research Question 3

What are the notable constraints to effective mentoring and how can they be overcome?

Research question 3 addresses the issue of constraints to effective mentoring and ways of overcoming them.

Seventeen constraining variables were identified from the questionnaire responses, interview and extensive observations of the mentors and beginning teachers.

The seventeen constraining variables were grouped into four constraining factors - Financial, professional, administrative and organisational.

The seventeen notable constraints' frequency and percentage are presented in table 4.4(a)

TABLE 4.4(a): FREQUENCY TABLE OF THE NOTABLE CONSTRAINTS TO EFFECTIVE MENTORING N=60

The Notable Constraints	Frequency	Percentage
A FINANCIAL		
1. Inadequate Instructional Materials	52	8.19
2. Inadequate Reward System	45	7.09
3. Lack of funds for organizing regular seminar and workshops	23	3.62
4.Dearth of Professional Journals	37	5.83
5. Non-remuneration for added responsibility of mentors	39	6.14
B PROFESSIONAL		
6. Lack of regular support meetings	33	5.20
7. Unco-operative attitude of some beginning teachers	29	4.57
8.Non-participation in subject association	23	3.62
9.Lack of interest in teaching	54	8.50
10. Lack of motivation	47	7.40
C. ADMINISTRATIVE		
11.Lack of private office space for mentors	28	4.41
12.Lack of release time for mentors	50	8.19
13.Too many teaching periods	40	6.30
14.Lack of trust between mentors and school management	25	3.94
D. ORGANISATIONAL		
15. Absence of initial induction courses for neophytes	47	7.40
16. Non-participation in seminars, conferences and workshops	18	2.83
17. Inability to pair mentor and beginning teacher of same subject area and same level	43	6.77
Total	635	

From the figure in table 4.4(a) the financial factor recorded the highest constraint to effective mentoring (30.87%) followed by the Professional Factor (29.29%). Organisational factor recorded the least constraint (17.01%). Both Financial and professional factors recorded five constraining variables each while organisational factor recorded the least which is three.

Lack of interest in teaching in professional factor posed the highest constraint (8.50%) to effective mentoring. This is in order as the success of mentoring hinges to a great extent on the interest of the mentored teachers in teaching as a profession.

Lack of release time for mentors (8.19%) is also a high constraining variable to effective mentoring as the mentors need time to observe their mentors as well as for feedback sessions.

In organisational factor, absence of initial induction for neophytes recorded highest constraining variable (7.40%) while non-participation in seminars, conferences and workshops recorded (2.83%)the lowest among the seventeen constraining variables.

Suggestions for overcoming the listed notable constraints were by again listed and are presented in table 4.4b.

TABLE 4.4(b): FREQUENCY TABLE OF THE SUGGESTIONS FOR EFFECTIVE OVERCOMING OF THE NOTABLE CONSTRAINTS TO EFFECTIVE MENTORING

SUGGESTIONS	FREQUENCY	PERCENTAGE
1. Initial induction courses for neophytes mainstreaming into the profession.	42	5.92
2. Regular support meetings	29	4.09
3. Provision of Instructional materials	48	6.77
4.Adequate reward system and other incentives	52	7.33
5. Provision of funds for organising	11	1.55
6.Regular participation in seminars, conferences and workshops	32	4.51
7. Provision of office space for mentors.	20	2.87
8.Beginning Teachers cooperation with mentors	19	2.68
9.Beginning Teachers' enthusiasm to demonstrate for and observe mentors	24	3.39
10. Providing release time for mentors	22	3.10
11.Pairing mentor and mentee of same subject area and same level	37	5.22
12.Membership and active participation on subject association	34	4.79
13.Provision of professional journals	19	2.68
14.Reasonable teaching load for mentors and mentee	35	4.94
15.Mutual trust between mentors and school management	18	2.54
16.Enthusiasm for teaching	48	6.77
17.Motivation of teachers	34	4.79
18.Remuneration for added responsibility	37	5.22
19. Positive attitude of teachers to work	45	6.35
20. Improved professional interaction among teachers	40	5.64
21.Adequate professional staff	22	3.10
22.Adequate professional training	41	5.78
	709	

In all twenty-two suggestions were offered in solving the problems posed by the seventeen listed notable constraints (table 4.4a). Adequate reward system and other

incentives recorded highest value (7.33%). This is not surprising as one expects interest and enthusiasm to teaching to improve with adequate incentives and reward system. Enthusiasm for teaching (6.77%) is also high as the success of mentoring will be influenced by the teachers enthusiasm to teaching as a profession.

Provision of instructional materials is also prominent (6.77) just like in table 4.4 (a) provision of Funds for organising regular seminars, and workshops as a suggestion for overcoming the notable constraints to effective mentoring recorded the least value of 1.55%.

4.3.4 Research Question 4

Is a teacher mentoring programme (TMP) as conceived also feasible?

This addresses the question of feasibility of TMP as perceived in this study. Again mean, standard deviation and Levene's equality of variances for the pre-test and post-test were compared to examine if TMP would be successful in enhancing the teaching competence of beginners as planned.

The result is presented in table 4.5

TABLE 4.5: PAIR-WISE COMPARISON OF THE TEACHING COMPETENCE OF THE BEGINNING TEACHERS IN PRE AND POST-TEST

VARIABLE	n	d	Sd	SE of MEAN	EQUALITY OF VARIANCE	P (0.05)
PRE-TEST						
EXPERIMENTAL GROUP	40	6.100	1.766	.279	.425	.517
CONTROL GROUP	40	6.3500	1.626	.257		
POST -TEST						
EXPERIMENTAL GROUP	40	10.6750	2.303	.364	3.424	.068
CONTROL GROUP	40	6.7250	1.679	.266		

The data in table 4.5 reveal that the two group prior to mentoring were found to be equivalent. The Pre-test mean for experimental (6.10) and control (6.350) are very close while between group compared to within group variances as a ratio is not significant ($F = 0.425$; $df = 38$; $P > .517$).

After administering TMP treatment on the experimental group with no treatment on the control the difference between the two means is appreciable at 10.675 and 6.725 for experimental and control group respectively. Again the F -value to test the equality of variances is significant [$F = 3.424$; $df = 38$; $P < .068$). Hence the high difference observed could only have been due to the effect of TMP, on the beginning teachers mentored.

The main aim of TMP is to improve the teaching competence of the beginning teachers. If this is achieved, then the TMP would be deemed to be feasible as was perceived as a sort of support to help the beginners meet their early career needs.

4.3.5 Research Question 5

What teacher type benefit most/least from TMP?

This addresses the issue of the teacher type that benefits most or least from TMP.

Ten teacher types were involved in the TMP and are listed as follows:

Training - Professional and non-professionals

Qualification - N.C.E., University and Polytechnic graduates

Gender - Male, Female

Experience - 1st year, 2nd year, 3rd year.

The mean, standard deviation and t - test values of scores of the teaching competence of the teachers involved in TMP were compared to show the teacher type that benefits most or least from the treatment. The result is presented in table 4.6.

TABLE 4.6: SUMMARY OF TMP GAIN BY TEACHER TYPES

S/No	TEACHER TYPE	n	d	Sd	t	p(0.05)
1	Professional	26	4.85	2.87	2.92	1.70
2.	Non-professional	14	4.3	2.63	2.12	1.77
3.	N.C.E	19	4.09	2.11	1.37	2.13
4.	University	12	5.58	2.91	1.27	2.23
5.	Polytechnic	9	3.88	2.09	1.07	2.37
6.	Male	17	4.59	2.62	1.83	2.13
7.	Female	23	4.07	2.94	1.83	2.08
8.	First Year	19	4.32	2.38	1.79	2.13
9.	Second Year	15	6.47	2.88	1.23	2.16
10.	Third Year	6	4.80	2.69	182	2.78

Table 4.6 shows that training attracts the highest gain. In other words training more than any other factor dictates the measure of gain from TMP. The professional teachers have the highest t-value followed by non-professionals. The gain mean for the professionals is also high at 4.85. If the trained teachers were able to improve on their teaching competence after being mentored, it means that if all the teachers are trained [that is, have acquired initial teacher training] and them mentored, an outstanding positive effect on their teaching competence would be obtained.

The data also show same t-value for the male and female teachers involved in TMP. This means that they both gain from TMP. This means that they both gain from TMP equally. It also means that gender has no effect on TMP gain.

The trained teachers (professional] benefit most [t=2.92] from TMP while that are polytechnic graduates benefit least [t = 1.23]

4.4 TESTING BY HYPOTHESES

4.4.1a HYPOTHESIS Ho_1

Hypothesis one stated that- there will be no significant effect of TMP on the teaching competence of Beginning secondary school science teachers.

This hypothesis was split into two to differentiate main from interaction effects as follows:

Hypothesis Ho1a: Stated that there will be no significant main effect of TMP on the teaching competence of Beginning secondary school science teachers.

It is to be noted that whereas Research Question 1 was interested in the presence of effects [main or interaction] it could not determine clear enough whether these would reach statistical significance. The testing of the above hypothesis now addresses this problem.

The mean and standard deviation were computed for the teachers in the experimental and control groups prior to and after mentoring treatment. Pair-wise t-test statistical technique was used to determine the main effect of TMP on teaching competence of the beginning teachers. The result of the analysis is presented in table 4.7

TABLE 4.7: PAIR-WISE COMPARISON OF THE MAIN EFFECT OF TMP ON THE TEACHING COMPETENCE OF BEGINNING TEACHERS IN PRE AND POST TEST

Variables	n	d	Sd	t	p(0.05)
PRETEST					
Experimental Group	40	6.1000	1.766	0.28ns	1.680
Control Group	40	6.3500	1.626		
POST TEST					
Experimental Group	40	10.6750	2.303	0.86ns	1.68
Control Group	40	6.7250	1.679		
MAIN EFFECTS [POST-PRE]					
Experimental Group	Post 40	4.5750	2.669	2.76*s	1.68
	PRE 40	6.1000	1.766		1.68
Control Group	Post 40	0.3750	2.145	0.45	1.68
	Pre 40	6.35000	1.626		1.68

*.S = Significant, P<0.05.

The data in the table 4.6 reveal that the main effect of TMP on teaching competence of beginning teachers is significant at P = 0.05.

The mean difference between the two groups yielded 4.20 which is considered high compared to the situation prior to mentoring when the two groups were equivalent.

The main effect of TMP on the experimental group is very significant with t-value of 2.76 when compared with pre-test value of 0.28 [prior to TMP].

On the basis of above findings, Ho_{1a} is rejected and the alternative which states that there will be significant main effects of TMP on the teaching competence of the beginning secondary school science teachers is upheld.

4.4,1b Hypothesis Ho_{1b}:

Hypothesis 1b stated that there will be no significant interaction effect of TMP on the teaching competence of beginning secondary schools science teachers.

An analysis of covariance [ANCOVA] test was conducted to examine the interaction effect of TMP based on experience, qualification, gender and training on the teaching competence of the beginning teachers in a pre-post treatment experimental design. The result of this analysis is presented in table 4.8

TABLE 4.8a: ANALYSIS OF COVARIANCE TEST ON INTERACTION EFFECT BETWEEN EXPERIENCE, QUALIFICATION, GENDER AND TRAINING ON THE TEACHING COMPETENCE OF BEGINNERS.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	P(0.05)
Covariates	2.876	1	2.876	.543	.470
Pre-Test	2.876	1	2.876	.543	.470
Main Effects	22.674	6	3.779	.702	.650
Experience	8.834	2	4.417	.821	.449
Qualification	8.415	2	4.207	.782	.446
Gender	2.430	1	.311	.058	.812
Trainee	.311	1	.311	.058	.812
Explained	25.549	7	3.650	.678	.689
Residual	172.226	32	5.382		
Total	179.775	39	5.071		

Table 4.8a shows that the main effect of TMP on the teaching competence of the beginning teachers based on the teachers' experience, qualification, gender and training is not significant at p=0.05. However training is close to having a significant main effect on TMP at F = 0.058 at .812 level of significance.

At 0.05 level of significance, no significant main effect of TMP based on the four variables was observed. This means that TMP will enhance teaching competence of the teachers irrespective of length of experience, entry qualification, gender and training.

The interactional effect of TMP based on the four variables was further examined using the two-way anova. The variables were examined in pairs. The results of interaction effect of experience and gender is presented in table 4.8.(b).

TABLE 4.8(b): ANALYSIS OF COVARIANCE TEST ON INTERACTION EFFECT BETWEEN EXPERIENCE AND GENDER ON THE TEACHING COMPETENCE OF BEGINNERS

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	p (0.05)
Covariates	2.876	1	2.876	.524	.474
Pre-Test	2.876	1	2.876	.524	.474
Main Effects	11.496	3	3.832	.699	.559
Experience	5.742	1	5.266	.960	.334
Gender	5.266	1	5.266	.960	.334
2-Way Interactions	2.453	2	1.226	.224	.801
Experience/Gender	2.453	2	1.226	.224	.801
Explained	16.825	6	2.804	.511	.795
Residual	180.950	33	5.483		
Total	197.775	39	5.071		

Table 4.8(b) shows that the interaction effect of the variables on teaching experience of beginning teachers is not significant as tabular F is greater than critical F (F = .511) at .795 level of significance] since F-value is not significant, experience and gender interaction effects do not influence significantly, acquisition of teaching competence through TMP by beginning teachers. The graph of interaction when plotted shows intersection where a bit of interaction was observed but do not reach a significant level at 0.05. The graph is presented in appendix x_1

Again two-way analysis of covariance (ANCOVA) was used to examine the main and interaction effects of TMP on the other variables in pairs - Experience/Qualifications, Experience/Training, Gender/Training, Gender/Qualification and Training/ Qualification.

TABLE 4.8(c): ANALYSIS OF COVARIANCE TEST ON INTERACTION EFFECT BETWEEN EXPERIENCE AND QUALIFICATION ON THE TEACHING COMPETENCE OF BEGINNERS.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	p (0.05)
COVARIATES	2.876	1	2.876	.509	.484
PRE-TEST	2.876	1	2.876	.509	.484
MAIN EFFECTS	20.156	4	5.039	.893	.480
EXPERIENCE	9.845	2	4.923	.872	.428
QUALIFICATION	13.926	2	6.963	1.234	.306
2-WAY INTERACTION	5.396	4	1.349	.239	.914
EXPLAINED/QUALIFICATION	5.396	4	1.349	.239	.914
EXPLAINED	28.428	9	3.159	.560	.819
RESIDUAL	169.347	30	5.645		
TOTAL	197.775	39	5.071		

TABLE 4.8(d): ANALYSIS OF COVARIANCE (ANCOVA) TEST ON INTERACTION EFFECT BETWEEN EXPERIENCE AND TRAINING ON THE TEACHING COMPETENCE OF BEGINNERS.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN	F	p (0.05)
COVARITES	2.876	1	2.876	.549	.464
PRE-TEST	2.876	1	2.876	.549	.464
MAIN EFFECTS	9.967	3	3.322	.634	.599
EXPERIENCE	5.340	2	2.670	.510	.605
TRAINING	3.737	1	3.373	.713	.404
2-WAY INTERACTIONS	12.041	2	6.021	1.149	.329
EXPERIENCE/TRAINING	12.041	6	4.147	.792	.583
EXPLAINED	24.884	6	4.147	.792	.582
RESIDUAL	172.891	39	5.239		
TOTAL	197.775	39	5.071		

TABLE 4.8(e): ANALYSIS OF COVARIANCE TEST OF INTERACTION EFFECT BETWEEN TRAINING AND GENDER ON THE TEACHING COMPETENCE OF BEGINNERS

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	p (0.05)
COVARIATES	2.876	1	2.876	.591	.447
PRE-TEST	2.876	1	2.876	.591	.447
MAIN EFFECTS	9.353	2	4.676	.961	.392
TRAINING	3.599	1	3.599	.740	.396
GENDER	4.726	1	4.726	.976	.331
2-WAY INTERACTIONS	15.297	1	15.297	3.145	.085
TRAINING/GENDER	15.297	1	15.297	3.145	.085
EXPLAINED	27.526	4	6.881	1.415	.249
RESIDUAL	170.249	35	4.864		
TOTAL	197.775	39	5.071		

TABLE 4.8 (f): ANALYSIS OF COVARIANCE TEST ON INTERACTION EFFECT BETWEEN GENDER AND QUALIFICATION ON THE TEACHING COMPETENCE OF BEGINNERS.

SOURCES OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	p (0.05)
COVARIATES	1.253	1	1.253	.276	.604
PRE-TEST	1.253	1	1.253	.276	.604
MAIN EFFECTS	8.053	2	4.027	.888	.425
GENDER	.480	1	.480	.106	.748
QUALIFICATION	7.505	1	7.505	1.656	.211
2-WAY INTERACTIONS	2.536	1	2.536	.559	.462
GENDER/QUALIFICATIONS	2.536	1	2.536	.559	.462
EXPLAINED	11.843	4	2.961	.653	.631
RESIDUAL	104.265	23	4.539		
TOTAL	116.107	27	4.300		

TABLE 4.8(g): ANALYSIS OF COVARIANCE TEST ON INTERACTION EFFECT BETWEEN TRAINING AND QUALIFICATION ON THE TEACHING COMPETENCE OF BEGINNERS.

SOURCE OF VARIATION	SUM OF SQUARES	DF	MEAN SQUARE	F	p (0.05)
COVARIATES	2.876	1	2.876	.525	.474
PRE-TEST	2.876	1	2.876	.525	.474
MAIN EFFECTS	10.735	3	3.578	.653	.587
TRAINING	.425	1	.428	.077	.783
QUALIFICATION	6.108	2	3.054	.557	.578
2-WAY INTERACTIONS	3.270	2	1.635	.298	.744
TRAINING/QUALIFICATIONS	3.270	2	1.635	.298	.744
EXPLAINED	16.881	6	2.813	.513	.794
RESIDUAL	180.894	33	5.482		
TOTAL	197.775	39	5.071		

The data in tables 4.7 to 4.13 showed that the interaction effects between the four variables on teaching competence of beginners is not significant at 0.05. Bits of interaction is observed as can be seen in the intersections observed in the graphs presented in appendix x^1 - x^4 but the interactions are not significant at five per cent level.

The fact that the interaction effects of experience, training qualification and gender are not significant at 0.05 shows that teachers' teaching competence improved with TMP irrespective of the initial qualification, training, experience and gender.

On the basis of the above finding hypothesis Ho1b is upheld.

4.4.2. HYPOTHESIS Ho_2

Hypothesis two states that there will be no significant difference in the teaching competence of professional and non-professional Secondary Schools science teachers involved in the mentoring programme.

Once again it is to be noted that Research Question 2 was interested in whether or not TMP equally affects professional and non-professional groups but hypothesis 2 seeks to find out whether differences between the two groups would reach statistical significance.

Again, the mean and standard deviation scores of the beginning teachers mentored were calculated after their exposure to mentoring treatment.

Pair-wise t-test procedure was employed to determine whether significant difference existed in the teaching competence of the beginning teachers owing to their being professionally trained or not. The detailed individual scores are presented in appendix M^{1-2} while the result of the analysis is presented in table 4.9.

TABLE 4.9(a): PAIR-WISE COMPARISON OF TEACHING COMPETENCY OF THE PROFESSIONAL AND NON-PROFESSIONAL TEACHERS MENTORED

VARIABLES	n	d	Sd	t	p(0.05)
PROFESSIONAL *(Trained Teachers)*	26	4.85	2.87	2.92	1.706
NON-PROFESSIONAL *(Untrained Teachers)*	14	4.3	2.63		1.761

^{s} = Significant; $P<0.05$.

The data in table 4.9(a) reveal significant differences in the teaching competence of both groups as a result of mentoring treatment.

As expected the trained teachers performed better than the untrained teachers. The trained teachers had already acquired explicit and expert knowledge peculiar to the teaching profession [Lortie, 1975). The mentoring treatment helped the teachers to further improve on their expertise.

The mentoring treatment had a tremendous positive effect on the teaching competence of both trained and untrained teachers involved in the mentoring programme.

The table however reveals the importance of training as it affects teaching competence of the beginners. The trained teachers out-performed their untrained counterparts. Therefore, the TMP can not be substituted for training as better results would be obtained if all the teachers in the mentoring programme are trained professionals.

To further confirm that the teaching competence of the beginning teachers can be enhanced by the mentoring treatment, the results of professional and non-professional teachers in the control sample were analysed. The mean and standard deviation of 23 professional and 17 non-professional teachers in the control sample were computed. The t-value was later calculated to examine if significant difference exist between the two groups and the result is presented in table 4.9(b)

TABLE 4.9(b): COMPARISON OF TEACHING COMPETENCE OF THE PROFESSIONAL AND NON-PROFESSIONAL TEACHERS IN THE CONTROL SAMPLE

VARIABLES	n	d	Sd	t	p(0.05)
CONTROL GROUP					
PROFESSIONAL	23	0.435	2.233	0.29	1.714
NON-PROFESSIONAL	17	0.176	2.120		1.740

The table 4.9(b) shows no significant difference in the teaching competence of the professional and non-professional teachers in the control group at $p > 0.05$. The professional teachers however performed better than the non-professional teachers as was also discovered in the case of mentored teachers.

Teachers in the control sample were not mentored, hence non-significant t-values were obtained for both groups as against the significant values [table 4.9(a)] obtained for the mentored sample.

Hypothesis two (Ho^2) is therefore upheld on the basis of the above findings that the teaching competence of the beginners were significantly enhanced when mentored.

4.4.3 HYPOTHESIS 3 (Ho_3)

Hypothesis three stated that there will be no significant difference in the teaching competence of beginning teachers involved in the TMP and those not involved. In other words, will there be any significant difference in the teaching competence of experimental group [mentored] and the control group [not mentored] ?

Mean (d) and standard deviation (sd) scores of all beginning teachers on the experimental and control group were computed after the administration of the mentoring treatment to the experimental group only.

Consequently, pair-wise t-test statistical techniques was used to determine whether significant difference existed in the teaching competence of the beginning teachers due to effect of the mentoring treatment on one group. The result is presented in table 4.10.

TABLE 4.10: PAIR-WISE COMPARISON OF THE TEACHING COMPETENCE OF EXPERIMENTAL AND CONTROL GROUPS IN THE PRE AND POST-TEST.

VARIABLES		n	$\bar{d}$	Sd	t	p (0.05)
PRE-TEST						
EXPERIMENTAL GROUP		40	6.10	1.76	0.28^{ns}	1.68
CONTROL GROUP		40	6.35	1.63		
POST TEST						
EXPERIMENTAL GROUP		40	10.68	2.30	0.86	1.68
CONTROL GROUP		40	6.73	1.7		
POST-PRE						
EXPERIMENTAL GROUP	POST	40	4.58	2.67	2.76^{*s}	1.68
	PRE	40	6.10	1.77		1.68
CONTROL GROUP	POST	40	0.38	2.15	0.45	1.68
	PRE	40	6.35	1.63		1.68

*S = significant at $p<0.05$.

The data in table 4.10 show a significant difference in the teaching competence of the two groups after exposure of one group to mentoring treatment.

The t-value of 2.76 is a measure of significance of the treatment (mentoring)effect on the experimental group while the non-significant t-value of 0.45 for the control group is close to the value obtained in the pre-test for both groups [$t = 0.28$; $df = 38$; $p < 0.05$].

Prior to the administration of the mentoring treatment to one group, there was no significant difference in the teaching of competence of both groups. The experimental group on exposure to mentoring out performed the control group.

The fact that beginning teachers that were mentored performed better than those not mentored reveals the need for mentoring to support the beginners.

This finding, therefore, forms the basis for the rejection of $H0_3$ and the acceptance of the alternative which states that there is a significant difference in the teaching competence of beginners involved in the TMP and those not involved.

4.4.4 HYPOTHESIS 4[Ho_4]

Hypothesis four stated that the teaching competence of beginning teachers exposed to TMP will not vary by:

(a) Educational qualification

(b) Length of experience

(c) Gender

The mean scores and standard deviation of mentored beginning teachers were computed by educational qualification, length of experience and gender. Two test procedure, [pair-wise t-test and one way ANOVA] were used depending on the nature of the data.

A summary of the t- test result on difference in the beginning teachers' competence by qualification, experience and training is presented in table 4.11(a). The detailed individual scores are provided in appendix N^{1-3}, P_{1-3}, O^{1-2}, and Y.

TABLE 4.11(a): THE T- VALUES OBTAINED IN COMPARING DIFFERENCES IN THE TEACHING COMPETENCE OF BEGINNING TEACHERS BY EDUCATIONAL QUALIFICATION, EXPERIENCE AND GENDER

VARIABLE	n	d	Sd	t	p(0.05)
EDUCATIONAL QUALIFICATION					
N.C.E.	19	4.09	2.11	1.37^{ns}	2.13
UNIVERSITY GRADUATE	12	5.58	2.91	127^{ns}	2.23
POLYTECHNIC	9	3.88	2.09	1.07^{ns}	2.37
LENGTH OF EXPERIENCE					
FIRST YEAR	19	4.32	2.38	1.79^{ns}	2.13
SECOND YEAR	15	6.47	2.88	1.23^{ns}	2.16
THIRD YEAR	6	4.8	2.69	1.82^{ns}	2.78
GENDER					
MALE	17	4.59	2.62	1.83^{ns}	2.13
FEMALE	23	4.07	2.94	1.83^{ns}	2.08

Table 4.11(a) shows that the N.C.E. teachers' teaching competence was superior to the other two groups. This is likely to be due to the fact they had undergone pre-service training. Some of the University Graduates, precisely seven were also trained teachers and this is likely to have contributed to their higher performance than the polytechnic graduates.

Most beginning teachers in the study sample seemed to have needed their first in-service year to master a number of pressing classroom management problems. Their

growth in teaching competence is however almost at par with their third year colleagues, but better than the second year teachers.

The data in table 4.11(a) also indicate that the teaching competence of the teachers in TMP will not vary by gender as the same t-value = 1.83 was recorded for both. It was generally observed that the beginning teachers benefitted from the TMP irrespective of qualification, experience and gender. The t-values obtained for all the levels of the variables reveal no significant differences in the teaching competence of the beginners involved in TMP at 0.05 level of significance as a result of varied qualification, experience and gender.

This positions was further investigated to determine whether significant differences existed between and within the three levels of qualification and experience. The result is presented in table 4.11(b).

TABLE 4.11(b): SUMMARY OF ONE WAY ANALYSIS OF VARIANCE [ANOVA] EXAMINING THE EFFECTS OF TMP ON BEGINNING TEACHERS' TEACHING COMPETENCE BY QUALIFICATION

SOURCE OF VARIATION	DEGREE OF FREEDOM DF	SUM OF SQUARES	MEAN SQUARES	F	p (0.05)
QUALIFICATION					
BETWEEN GROUP	2	14.8	7.4		
RESIDUAL	37	192.8	5.2	1.42^{ns}	3.23
TOTAL	39	207.6	12.6		
EXPERIENCE					
BETWEEN GROUP	2	11.10	5.55		
RESIDUAL	37	104.23	2.82	1.96^{ns}	3.23
TOTAL	39	115.33			

The F-values obtained in table 4.11(b) for Qualification (F cal 1.42; Ftab 3.23, $p > 0.05$) and Experience (F cal 1.96; Ftab 3.23; $p>0.05$) show that there was no significant difference in the teaching competence of the beginning teachers in the TMP based on qualification and experience.

The fact that all the teachers mentored benefited immensely irrespective of their entry qualification, experience and gender confirms the feasibility of TMP as conceived as well as the worthwhileness of this study.

Hypothesis Ho_4 is therefore upheld based on the above findings.

4.5 SUMMARY OF OUTCOMES

The conclusion of the results of this study are as follows;

1a The TMP [experimental treatment] had significant main effects on the teaching competence of the beginning teachers involved in the programme. The beginning teachers' teaching competence were significantly improved after the TMP treatment.

b. The interaction effects of the four independent variables examined were not significant enough to affect the acquisition of teaching competence by beginning teachers through TMP. The four variables were academic qualification, experience,training and gender.

2(a) The TMP significantly improved the teaching competence of both professional [trained] and non-professional [untrained] teachers involved in the programme.

(b) The TMP complements training in improving the teaching competence of the beginners [whether trained or untrained]. The TMP, therefore, can not be regarded as a substitute for training. But outstanding success will be recorded if all the teachers in the programme were professionals since trained mentored teachers out performed the untrained but mentored.

(3) The beginning teachers in the experimental group displayed superior teaching competence compared to the teachers in the control group. The experimental treatment, [TMP] significantly improved the beginners' teaching competence.

(4) The fact that the experimental group out performed the control group shows the need for TMP to support the beginners early in their career.

(5a) All the beginners involved in TMP improved their teaching competence significantly irrespective of qualification, length of experience and gender.

(b) The N.C.E teachers out-performed the University graduates and polytechnic graduates as they (NCE teachers) are professionals.

(c) The third year teachers significantly performed better than the first and second year respectively.

(d) Gender had no significant effect on the acquisition of teaching competence through the TMP. The teaching competence of both male and female teachers involved in TMP were at par.

(6) The interview results revealed, among others, that the beginning teachers desire good rapport and collegial support from experienced colleagues.

The problems identified as very difficult are:

Identifying characteristics of good teaching, Selection of appropriate teaching methods, availability of materials/resources and classroom discipline.

(7) The questionnaire revealed that many beginners did not go through any initial induction course before mainstreaming into the teaching profession.

4.6 DISCUSSION OF FINDINGS

4.6.1 INTRODUCTION

This study attempted to examine the extent to which TMP affects the teaching competence of beginning secondary School Science teachers. It also investigated the effect of professional training on teaching competence of beginning teachers involved in TMP.

The study in addition examined which biographical variables affect or influence TMP. The findings are discussed in the order in which they are summarised.

4.6.2 THE EFFECTS OF TMP ON THE TEACHING COMPETENCE OF BEGINNING SECONDARY SCHOOL SCIENCE TEACHERS.

The results of the analysis of Research Question 1 and Hypothesis1 showed that TMP affect the teaching competence of beginners. The post-test [$t=2.76$; $df=38$; $p<0.05$] and pre-test [$t=0.28$, $df=38$; $p>.05$] of beginning teachers involved in the TMP imply that the teaching competence of the beginning teachers mentored improved considerably compared to the situation prior to treatment due to the effect of TMP. This finding is not surprising as it supports the findings of Ferguson(1989) who reported that managers who had mentors compared to those who did not have, showed higher levels of job satisfaction and higher promotion rate. Roche(1979), similarly asserted that executives, who have had a mentor earn more money and are likely to follow a career plan and in turn sponsor more proteges than executives who have not had mentors.

Empirically, this study is also consistent with Erkut and Mokro's (1984) study which found a statistical significant correlation between mentoring and academic success in a survey completed by 725 students of six different liberal Arts colleges. They concluded that owing to mentoring all respondents were able to identify a professor who had an impact on them by demonstrating the kinds of commitments, skills and qualities that they saw as important for themselves.

On this basis, it is not surprising when the study found that prior to the administration of mentoring treatment to the experimental group there were no significant differences in the teaching competence of both groups, whereas significant difference was observed after TMP administration to the mentored group. This finding is also consistent with Hibel's [1978] study which showed a significant curvilinear relationship between contact with faculty and academic achievement, such that the first few informal interactions with Faculty appear to be the most important. This finding also corroborates Booth's (1993) who reported in a study of 45 postgraduate Certificate in Education (PGCE) students that 88% of the students felt generally satisfied with the mentoring they had received. He concluded that effective mentors made time available, were approachable, had fact and empathy, were not too directive, were good listeners, and gave constructive criticisms and guidance.

The researcher believes that mentoring benefits the beginning teacher, the mentor and the school. The beginning teacher's opportunity to exchange views with an experienced teacher [mentor] is a distinct benefits to her/him. The mentor benefits more from opportunity to share views, experiences and strategies. The improved teaching that usually results is an asset to the school. On the other hand, it was observed that some of the beginning teachers were not ready to invite the mentors due to feelings of insecurity and therefore "closing off" contact with people who might notice teaching being done poorly. For instance one of the respondents [beginning teachers] in the experimental/group complained that she and her mentor did not relate with each other. Later on, after overcoming this snare, she happily commented about her mentor as:

> *someone who has a framework for our encounters. She gave me a focus and I tried to do different stuff so she could tell me about it.*

Afterwards, all the beginning teachers mentored felt it was important to have mentors who taught the same subject. Thus, later successes were recorded as many beginning teachers described their mentors as supportive, helpful and unobtrusive. Hence the need for mentoring to support the beginners early in their teaching careers is imperative.

4.6.3 THE INTER-ACTION EFFECTS BETWEEN QUALIFICATION, EXPERIENCE, TRAINING AND GENDER ON THE TEACHING COMPETENCE OF BEGINNING TEACHERS MENTORED

The findings in this study showed that there were no significant inter-action effects between the independent variables. The interaction effects of the four variables together were not significant at 0.05 level of significance [F = 0.678; p>.689]

The same trend was observed on pair-wise investigation of the interaction effects of the variables using two-way ANCOVA -[table 4.7-4.13]

Experience/training recorded F-value of 0.792; Training/gender 1.415; Training/Qualification .513; Gender/Qualification .653; Experience/gender.902; Experience/Qualification .560.

Training and gender showed the least interaction effect [F=1.415]. This finding is consistent with Anderson and Shanon[1988] study's report that gender interaction effect does not significantly influence the acquisition of mentoring scheme by the beginning teachers. Training and qualification at F=.513 showed the highest potential to having interaction effect at 15% level of significance though the interaction effects are not significant at 5%.

As a matter of fact the interaction effects between qualification, experience, training and gender on the teaching competence of mentored beginning teachers are not significant.

This confirms that mentoring treatment has positive effect on teaching competence of all teachers exposed to it irrespective of their qualification, experience, training and gender differences.

This assertion is also corroborated by the studies of Eliot and Calderhead [1993] and Smyth and Day [1994] that stressed the non-significant interaction effect of qualification, training and gender on mentoring treatment effectiveness. They concluded that the key to success as a mentee is to be an effective and a reflective intern and trainee.

4.6.4 THE EFFECTS OF PROFESSIONAL TRAINING ON TEACHING COMPETENCE OF THE TEACHERS INVOLVED IN TMP

The result of the analysis of Research Question 2 and Hypothesis 2 revealed that the mentored professional beginning teachers out-performed the non-professional teachers. In other words the trained teachers exhibited superior teaching competence [$t=2.92$; $df=24$; $p<0.05$] compared to the untrained teachers[$t=2.12$; $df=12$; $p<0.05$] even though both of them showed outstanding improvement after TMP.

The fact that the trained teachers performed better than the untrained ones is not surprising as this corroborates Lortie (1975) study that says "the professionals had already acquired "explicit and expert knowledge" required by the teaching profession. The TMP only helped in sharpening their expertise.

The professionals were helped to apply this 'expert knowledge' by the supportive experienced mentors. The non-professionals had not been exposed to the 'expert knowledge' peculiar to the teaching profession as they never attended any teacher training college.

The TMP when administered had tremendous positive effect on teaching competence of both groups but more gain were recorded by the professionals. Thus the TMP was observed to have improved the teaching competence of all beginners

irrespective of whether they were trained teachers or not but the trained teachers out-performed the untrained ones.

This finding is supported by Colbert and Wolf (1990) study on Los Angeles Unified School District Collaborative Model- a type of Teacher mentoring programme. Colbert and Wolf reported that project, non-professional teachers used more effective instructional planning practices, provided more learning opportunities for students and had higher student engagement rates than non-project, professional teacher participants. They concluded that the project non-professional teachers were more positive in their perception of teaching as a career than non-project professional teachers in similar schools who were not involved in the programme.

Again the fact that the trained teachers in TMP displayed better teaching competence is not unexpected. The findings of Virginia State Department of Education (1985) revealed that teacher who had training [professional] scored significantly higher than teachers who had no teacher training [non-professionals] especially on two competence-affective climate and individual differences. This finding of Virginia Beginning Teacher Assistance Programme(1985) corroborates Hoffman and Roger's (1985) finding [on why trained teachers in the programme out-performed the untrained ones] that the non-professional beginning teachers perceived themselves as deficient in the ability to keep students on tasks.

This researcher is of the opinion that mentoring improves the teachers' competence whether formally trained or not. This is because mentoring provides a context in which the mentee can reflect on her/his practice and through observation that of others, that is, the route for the mentee, is through the acquisition of individual

competence. It would seem then that, at root, the key to success as a mentee is to be both an effective and reflective practitioner [teacher]. Although, both of these qualities seem to depend to a significant extent on the ability to undertake critical analysis of one's own and other people's reason. These two important skills form the basis for mentoring effectiveness regardless of being a professional or non-professional teacher.

4.6.5 CONTRIBUTIONS OF BIOGRAPHICAL VARIABLES TO EFFECTIVENESS OF TMP IN ENHANCING TEACHING COMPETENCE OF BEGINNERS

4.6.5.1 Educational Qualification and Length of Experience:

The findings in this study showed non-existence of significant difference in the teaching competence of beginners exposed to mentoring due to educational qualification [N.C.E.t=1.37; df=17; p>0.05; University graduates;t=1.27; df=10; p>0.05; Polytechnic Graduates; t=1.07; df=7; p>0.05] and length of experience [1st year;t=1.79; df=17; p>0.05; 2nd year; t=1.23; df =13; p>0.05; and 3rd year, t=1.82; df=4; p>0.05] respectively.

This implies that regardless of beginning teachers educational qualifications and teaching experience, mentoring treatment improved their teaching competence all at the same time. This shows the consistency in mentoring as a treatment for the beginning teachers over time.

This finding is consistent with several earlier studies such as those by Scarter, spring-field and Wolfe[1986], Cobert and Wolf [1990], Little(1990) and Kerry and Barrow (1995) to mention only a few.

Scarter, Springfield and Wolfe [1986] found in their study Innovative Beginning Teacher Induction Programme (TIP) that, given active support, a full year of teaching experience, structured opportunities for reflection during a second year, and continued support and feed back throughout their second year of teaching, second year inductees adopted more sophisticated instructional techniques. This Scarter, Springfield and Wolfe's (1986) was corroborated by Bruce and Shower's (1988) work on Staff development on reflective coaching, a form of mentoring. They showed that reflective coaching effects on skill at implementing new teaching strategies increases as training programme includes more of information provision, theory, demonstration, practice feedback and coaching. They concluded that staff training does not appear to assist teachers reliably to transfer their new skills into new situations until the training includes at least theory provision, plus demonstrations, plus practice.

Similarly, Cobbert and Wolf [1988] asserted that project participants at both elementary and secondary levels reported that the structured interaction between the lead and beginning teachers that occurred on a regular basis was the most important component of the project [mentoring] . They also reported that the University classes that were attended by beginning and lead teachers enabled them to work collaboratively to implement strategies in their classrooms that removed the feelings of isolation that many new teachers feel. They concluded that mentored beginning teachers used more effective instructional planning practices, provided more learning opportunities for students and had higher student engagement rates than mentored lead project participants.

Furthermore, Keery and Barrow (1985) Open University Certificate in Education (PGDE) mentoring scheme, showed that 97% of the students-teachers reported that mentoring helped them fit into their roles as beginning teachers and were satisfied with the quality of mentoring received. Sixteen percent (16%) rated their mentors as outstanding, 51% said that they were very good. Only 3% complained that the quality of mentoring they had received was poor. They concluded that student teachers recognise the important role which mentoring has in shaping their professional performance and improvements.

Again, Little (1990) in his pilot Head Teacher Mentoring Scheme, revealed that the neophyte head teachers stated that they had benefited from the scheme. The benefits had in common were, reflecting on what it means to be a head teacher, obtaining another perspective, reducing isolation of headship, improving self-confidence and providing emotional support.

Further analysis of the data on summary of the effects of mentoring treatment on beginning teachers, teaching competence on the basis of qualifications and length of teaching experience were found not significant. That is, there is no significant difference in the teaching competence of the beginning teachers mentored owing to educational qualifications [$F=1.42$; $df=2/37$; $p>0.05$] and length of experience [$F=1.96$; $df=2/37$; $p>0.05$] respectively.

Researcher is of the opinion that the non-significant difference in the teaching competence of the beginning teachers exposed to mentoring treatment due to educational qualifications and their length of teaching experience is to further show improvement in their teaching competence than when the treatment [mentoring] had

not taken place. In an ordinary parlance, effects of mentoring has been established by the findings in this study that the beginning teachers react positively to mentoring treatment irrespective of qualification obtained and the length of teaching experience. This further reinforces the feasibility of the teacher mentoring programme as earlier perceived.

However, it was observed that some beginning teachers before the treatment (mentoring) specifically during the survey of their perception of problems confronting beginning teachers appear qualified on paper but have minimal preparation. Some lack self-confidence, some have problem with lesson plan and deficient in pedagogical knowledge, deficient in maintaining consistent accountability procedures and problems of classroom organisation and discipline. As a point of fact, the Questionnaires on perception of problems confronting Beginning Teachers (QHODPBT and QPPBT)revealed that the beginning science teachers have priority need for assistance in planning and implementing instruction. This should create concern because if the science teachers are not highly competent in these areas one wonders what science they would be able to teach! This perhaps accounted for the researcher's embarkment on testing whether there exists a significant difference between teacher talk and student activities. The result shows that there exists significant difference between teacher talk and student activity or talk ($t=7.42$; $df=21$; $p<0.05$). This implies that the teachers dominated the classrooms most of the times. This contrasted with the trend in learning science that favours more activities on the part of the students than teachers (Butt,1993; Baiyelo

et-al 1988; Odunsi 1984). Thus, one can safely deduce that beginning teachers are prone to more of lecturing in the classroom than teaching.

This findings is in line with Ward and Tikunoff (1989) study where they suggested that new teachers require time to develop the complex repertoires of behaviour necessary to succeed in classroom even when provided with unusual high levels of support and direct feedback. But experienced teachers in the study displayed remarkable changes in a variety of classroom behaviours within a single semester. First year teachers in the study did not make such rapid adjustments as had been the case with first-year inductees in California.

Again, this study's finding also supported Weinstein (1988) claim that despite beginning teachers' general belief that they will not have problems in managing, instructing, and developing interpersonal relationships, they do have concerns about establishing general managerial routines, such as, classroom organisation and discipline. They are also prone to unrealistic optimism establishing social relationships with students and other teachers and creating contexts that support their own professional development.

4.6.5.2 Gender

Another finding of this study with respect to the difference in the teaching competence of male and female teachers exposed to the mentoring programme showed the non-existence of significant difference in their teaching competence. In other words, there is no significant difference in the teaching competence of male [$t=1.831$; $df=15$; $p>0.05$]; and female [$t=1.833$; $df=21$; $p>0.05$}] respectively.

As a matter of fact, the gender interaction effect [F= .452] among treated (mentored) teachers owing to their teaching competence is insignificant. This further confirms the fact that mentoring treatment has positive effect on teaching competence of all teachers exposed to it (metoring) irrespective of their gender difference. Several earlier studies have corroborated its(gender) non-significance. Ebutt (1985) found that mentoring provides a context in which the mentee regardless of sex differences can reflect on his/her practice and through observation that of others. Also other works by Harvard Dunne (1992), Elliot and Calderhead (1993) and Smyth and Day (1994 have stressed the non-significant influence of gender on mentoring treatment effectiveness. They concluded that the key to success as a mentee is to be an effective and a reflective intern and trainee. These two important skills form the basis for mentoring effectiveness.

Again, Anderson and Shannon (1988) reported that gender interaction effect does not significantly influence the acquisition of mentoring scheme by the beginning teachers. Thus, it further helps in the development of the protege's skill, abilities and understanding.

The reasons for insignificant difference in the performance of both male and female beginning teachers exposed to the mentoring treatment could be discerned from the fact that the treatment (mentoring) during the experiment is neither discriminating nor constituting a distinctive gender trait in the manner of implementing the treatment. This is perhaps owing to the one -to-one learning relationships between an older and a younger person [on the job] that is based on modelling behaviour and extended dialogue between them (Leister and Jonhnson, 1981). Hence the treatment

is a form of professional socialisation whereby a more experienced, (usually older) individual acts as a guide, role model teacher, and patron of a less experienced (often younger) Protege. No wonder, this could be the major reason why the respondents plausibly affirmed that the treatment (mentoring) greatly helped them to "fine tune their instructional skills and classroom management skills". Not only this, but also helped their perception of mentoring process in which they saw, reflected in a mentor, aspects of their own selves, facets not clearly focused and potentials not fully realised. Therefore, mentoring as regards the findings in this study benefits the beginning teacher, the mentor and the school. Thus, the beginning teacher's opportunities to exchange views with an experienced teacher is a distinct benefit to him/her. Likewise, the mentor benefits from opportunity to have his views, experiences and strategies shared by others. No doubt, the improved teaching that usually results is an asset to the school.

CHAPTER FIVE

DEVELOPMENT AND VALIDATION OF THE MENTOR - BEGINNER DYAD TRAINING PACKAGE (A TEACHER MENTORING PROGRAMME FOR FIRST YEAR AND PRE-SERVICE TEACHERS)

5.0 INTRODUCTION

Due to statistical significance of the mentoring treatment, specifically in the experiment carried out in this study, the researcher consequently thought it wise to further extend the horizon of the aforementioned and the earlier reported findings above. It was necessary thereof to develop and trial test a "DYAD TRAINING PACKAGE – A TEACHER MENTORING INDUCTION PROGRAMME" for first year and pre-service teachers on practicum only, to enhance their competence. The term 'DYAD' was used as the relationship involved the duo of inductor and inductee.

Hence the researcher further examined the relationship between the mentor and the beginning teachers; as a way to propose a programme for induction of new entrants into the teaching profession.

5.1 THE MENTOR-BEGINNER DYADIC RELATIONSHIP

According to Anderson and Shannon (1988), mentor programmes for beginning teachers should be developed with the right definition of mentoring that captures the essence of mentoring relationship. If this is not done one runs the risk of developing programmes that are incomplete and lack integrity.

Anderson and Shannon further stressed that developers must focus on what they believe are the essential functions of mentoring; identify possible mentoring activities in which these functions can be expressed; and they must develop the dispositions that mentors are to exhibit as they carry out the functions and activities. Thus it is believed that it is only when a strong and clear conceptual foundation of mentoring is established can effective mentor programmes be constructed.

Therefore, the questions to be answered are:

(a) What are the essential functions of mentoring?

(b) What are the activities in which these functions can be expressed.

(c) What are the dispositions to be exhibited by the mentors when they are carrying out the functions and activities.

To clarify the concept of mentoring in developing and implementing mentoring programmes for new teachers, emphasis should be on five mentoring functions, basic mentoring activities and necessary dispositions of mentors.

Considering the issues highlighted the need arises to offer a basic definition of mentoring which is ably presented by Anderson (1987) that mentoring

> *is a nurturing process in which a more skilled or more experienced person, serving as a role model, teaches, sponsors, encourages , counsels, and befriends a less skilled or less experienced person for the purpose of promoting the latter's professional and/or personal development. Mentoring functions are carried out within the context of an ongoing, caring relationship between the mentor and protégé.*

The essentials of this definition are:

(a) the process of nurturing

(b) the act of serving as a role model

(c) the five mentoring functions (teaching, sponsoring, encouraging, counselling and befriending)

(d) the focus on professional and/or personal development

(e) the on-going caring relationship.

Each of the attributes is briefly described below to provide a better context for their inclusion.

Mentoring Relationship:

In a mentoring relationship, the protégé views the mentor as a role model while the mentor nurtures and cares for the protégé.

Nurturing:

This implies a developmental process in which a nurturer is able to recognise the ability, experience and psychological maturity of the person being nurtured and can provide appropriate growth producing activities. The nurturing concept also implies several notions embedded in the "garden" metaphor. The nurturer helps provide an environment for growth, considers the total personality of the person being nurtured in deciding how best to be helpful, and operates with a belief that the person being nurtured has the capacity to develop into fuller maturity.

Role Modeling:

Closely related to the nurturing process is the act of serving as a role model. Mentors provide the proteges with a sense of what they are becoming. Proteges can see a part of their adult selves in other adults (Levinson at al, 1978). By their example, mentors stimulate growth and development in their proteges.

Caring:

The kind of relationship in mentoring is similar to that of a good substitute parent to an adult child. Mentoring must involve an ongoing, caring relationship Levinson et-al 1978).

Mentoring Functions:

The five functions of mentoring are teaching, sponsoring, encouraging, counselling and befriending.

Teaching:

This includes all basic behaviours associated with teaching, such as, modeling, informing, confirming/disconfirming, prescribing and questioning. These behaviours, in the context of mentoring are guided by principles of adult education.

Sponsoring:

Sponsoring involves being a kind of guarantor. Sponsoring within the context of mentoring involves three essential behaviour: protecting, supporting and promoting. Teacher mentors can protect their proteges from something in the

environment (e.g. helping to solve the problem of disciplining a very troublesome student in their class), or by helping protect the proteges from themselves (e.g. encouraging them not to stay up late every night preparing lessons until their health is impaired). Teacher mentors can support their proteges when they participate in an activity assigned to then (e.g. preparing lesson plans together). As sponsors, teacher mentors can promote their proteges both within the instructional and social systems of the school programme. They can, for example, not only introduce them to other teachers and help them feel included but also recommend that their proteges serve on a school committee.

Encouraging:

This is a process that includes the behaviours of affirming, inspiring and challenging. Teacher mentors can affirm their proteges for who they are and what they can do; they can inspire them by their example and words and they can offer challenge by inviting them to become involved in a variety of growth producing experiences.

Counselling :

This is a problem-solving process that includes behaviours such as listening, probing, clarifying and advising. To the degree that proteges are willing and able, teacher mentors can help solve their own problems.

Befriending:

While it is difficult to delineate all of the behaviours associated with befriending, two critical ones stand out: accepting and relating. As a friend, teacher mentors will in continuing ways convey to their proteges that they understand and support them; and they have time for them.

Mentoring Activities:

Basic mentoring activities in the area of education include: demonstrating teaching techniques to a protégé, observing the protégés classroom teaching and providing feedback and holding support meetings with the protege.

Mentoring Dispositions:

Kartz and Raths (1985) defines mentoring disposition as an attributed characteristics of a mentor, one that summarizes the trend of the mentor's actions in particular contexts. Dispositions are broader constructs than skills and denote recurring patterns of behaviour. There are three dispositions that are essential to the concept of mentoring (Katz and Raths 1985). These are that

(a) Mentors should have the dispositions of opening themselves to their proteges by, for example allowing their proteges opportunities to observe them in action and conveying to them reasons and purposes behind their decisions and performance.

(b) Mentors should have the disposition to lead their proteges incrementally over time.

(c) Mentors should have the disposition to express care and concern about the personal and professional welfare of their proteges.

The whole essence of mentoring and its basic components are represented in diagram 5 as a mentoring model.

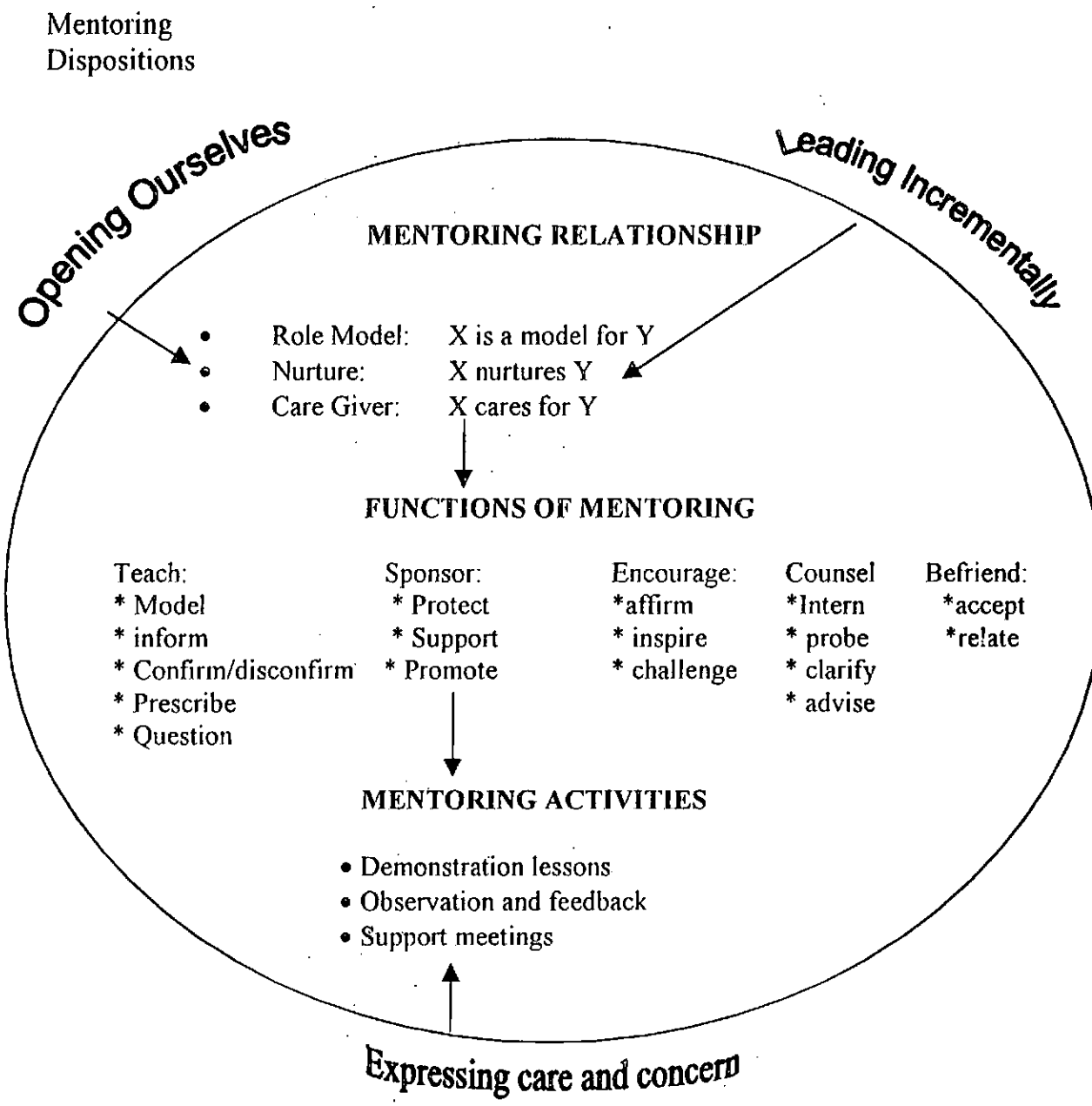


Figure 5.1 The Mentoring Model (Anderson and Shanon 1985)

5.2 Developing the Mentor – Beginning Dyad Mentoring Programme

The mentor-beginner dyad mentoring programme presents a comprehensive array of ways of inducting beginning teachers to enhance their competence.

As asserted by Anderson and Shannon (1988:38-42) the mentoring relationship has three essential features (role modeling, nurturing and caring) and entailed in the relationship are five mentoring functions that are carried out within three mentoring activities. The entire mentoring process is styled by a set of dispositions displayed by the mentor.

The three mentoring activities: demonstration, observation with feedback and support meeting can be further broken down into many activities which includes actions that correspond to traditional conception of apprenticeship (Schon, 1987).

The Teacher Leader Programming (Rogue, 1988), Interaction within Mentoring relationship (Wildman et-al, 1992; Kennedy, 1991; and Little 1990), The mentoring model (Anderson and Shanon, 1988; Katz and Raths, 1985; Baiyelo et-al 1998) provided suitable framework for developing the mentor-beginner Dyad mentoring programme.

The researcher also considered the major areas of concern for beginners during observation at work and pitfalls noticed during the process of mentoring in coming up with this programme.

The researcher assumed;

(a) that the mentors satisfied all the twelve criteria for would-be mentors (Wildman 1989)

(b) the mentor would have been trained in the mentoring relationships encompassing mentoring functions, activities and dispositions. In the mentor-beginner dyad mentoring programme the perceived areas of beginners need/concerns and corresponding mentoring activities (ways of helping) were analysed and grouped into direct and indirect professional Assistance.

5.3 Data Collection Procedures

The researcher compiled the complete record of the mentors and mentees notes, verbal explanations and comments from small group discussions designed to promote sharing of mentoring techniques, activities and experiences. The sessions were conducted towards the end of the term during which mentoring took place.

The log books of mentors and mentees and a variety of short surveys were examined for comparison purposes including the activities reported by mentors and mentees.

5.4 Data Analysis

Using qualitative techniques (Erickson, 1986; Miles and Hubberman, 1984; Spradley, 1980), the researcher grouped all of the spoken and written comments and notes according to the four major categories of activities (that the three

mentoring activities were further broken into getting students' co-operation, instruction, Administrative tasks and school/working Environments. As a group, the participants discussed the specific activity, the way the activity was enacted, and the mentor's/beginning teacher's intention or reason for doing this particular action in this particular way.

At the end of the analysis, subtle nuances of mentoring emerged, where mentors might use the same way of helping with a different mode of enactment depending upon their intentions. Lastly the analysis focused on those factors that mediated the success of mentoring relationships. Data from all reported sources were used to identify problems, concerns and successes experienced by mentor-beginner dyads. The dyad was chosen as a unit of analysis because the focus was on the relationship between mentor and beginner. From the information obtained three factors that may make or mar the mentoring relationship were identified. These are the contextual factors that impinged on the dyad, mentor characteristics and beginner characteristics.

5.4.1 Results:

The researcher was able to identify ten ways of providing assistance to beginners that are also synonymous with the competence they are expected to possess. These ten ways are shown in the first column of Table 5.1, arranged so that they can be traced across the four areas of beginning teacher concern or need.

These mentor actions and strategies were grouped according to the actions involved in the assistance interactions. Most of the actions occurred within the mentor-beginner dyad, but some interactions were extended to persons outside the dyad.

The resulting matrix contains representative activities that show concretely how mentoring was defined in this programme for new teachers entering the teaching profession. Just as the beginning teachers in the mentoring process for the three months revealed a bewildering array of needs, concerns and problems during their early months of teaching, the mentors also demonstrated a diverse and extensive array of ways to meet the beginners' needs. They reported dozens of actions, strategies, and supportive postures that they invented, adopted, copied or intuitively performed to help their beginners.

The organisational scheme shown in table 5.1 is an attempt to propose a programme for induction of new entrants into the teaching profession.

TABLE 5.1: THE TEACHER MENTORING PROGRAMME FOR THE NEW ENTRANTS (TMPNE) INTO THE TEACHING PROFESSION

		MENTORING ACTIVITIES			
	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKIN G ENVIRONMENT
1.	Orientation	Explain all school routines, rules and showed ways to be flexible with students. Talk about individual child.	Provides beginning teachers (BT) information basic to adjustment to the class and school. Help beginning teacher locate resource materials, persons and supplementary materials.	(a) Discuss procedure and rational for school policy. (b) Explain background of acronyms and jargons. (c) Introduce beginning Teacher to members of administrative staff and co-teachers.	(a) Discuss unwritten school policies. (b) Explain roles of special building personnel, went over school philosophy. Show physical set-up of the classroom, school buildings and school grounds.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
2.	Planning	(a) Involve beginning teachers in planning and directing learning activities of students. (b) Caution about being too formal. Stress flexibility.	(a) Explain the principles related to certain teaching techniques. (b) Demonstrate for the beginning teacher different methods or procedures of teaching when problem occur. Review lesson plans. Advised on suitable material for grade level. Acquainted with materials and techniques.	Keep on line with deadlines. Alert as to what is important and what is not. Reminded to go to meetings and to hand in forms etc.	Encourage participation in extra-curricular activities sponsored by school and community. Advise against spending too many hours at school. Advise as to situations to refer to office. Warn about "lounge lizards".

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
3.	Subject Knowledge	Observe teaching. Helped solve problems Independently Adapt weekly behaviour sheets. Give set of laboratory and classroom rules. Share procedures that worked. Relate personal experience.	Provide manipulatives for the laboratory practices. Give plans for advanced learning. Loan pre-made centres' (e.g. laboratory or class previously set up for the lesson) share notebook. Familiarise with curriculum guidelines.	Give checklists for field trips. Give materials for bulletin boards. Answer numerous administrative questions	Offer tips on using aids. Help to prioritise needs.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
4.	Class Management	(a) Tell beginning teacher proven techniques of classroom management. (b) Encourage beginning teacher to comment on his/her students' positive behaviour (c) Give "lader" of discipline procedures.	(a) Give praise for new techniques. Write note of thanks for instructional idea. (b) Give encouragement on adjustments of classes.	(a) Follow up after staff meeting to check understanding. (b) Share organising 'system'.	(a) make aware of scheduling, opportunities and supplies before they were taken. (b) describe scheduling and expectations.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
5.	Communication	Help develop good speech articulation and appropriate vocabulary to get students' attention.	(a) make beginning teacher aware of voice, pronunciation, and level of vocabulary. (b) Assist beginning teacher to develop clear questioning technique to motivate students.	(a) Strive to include beginning teacher's in discussions in staff meetings. (b) Encourage teaming with other members on field trips and laboratory works.	(a) Encourage inclusion in after-school hours get together. (b) Share method of positive communication.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
6.	Evaluation	(a) Help beginning teachers to monitor students behaviour and responses (b) Help beginning teacher to monitor students' progress. (c) Assist beginning teacher to mark work more carefully and/or regularly. (d) Encourage beginning teacher to always relate assessments to teaching.	(a) assess the progress of the beginning teacher. (b) Check unit and daily plans of the beginning teacher (c) Keep a comprehensive record of the activities and progress of the beginning teacher.	(a) Show different grading systems. (b) Solicit office support to type materials for regular students' assessments.	Compare assessments of other colleagues with the beginning teacher's assessments.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
7.	Reflecting on practice	(a) Discuss matching discipline strategies to beginning teachers. (b) Model activities reflecting the past.	(a) Model how to teach. (b) Listen to instruction concerns (c) Show different grading systems that worked.	(a) Show how to order supplies considering long range goals. (b) Consumability of materials.	(a) Discuss unwritten social requirements (b) Discuss and decide on best use of available space.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
8.	Professionalism	(a) Help form a support network. (b) Ask advice of principal for beginner. (c) Model enthusiasm for teaching	(a) Try to match beginning teacher with other teachers on similar grade level (b) Suggest other teachers to talk to who dealt with same subject and students.	(a) Encourage beginning teacher to volunteer to contribute outside the classroom (meetings etc) (b) Contribute well to pastoral activities. (c) Solicit sponsorship for beginner to teachers' convention conferences and other organisational meeting	(a) Involve beginning teacher in extra curricular activities sponsored jointly by school and/or community. (b) Participate actively in seminars and in-services training for staff. (c) Keep open door. Extend welcome. (d) Socialise with beginner (e.g. ate with them at lunch break

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
9.	Personal Qualities	(a) Share how to enhance rapport with students. (b) Encourage to ask after students' welfare. (c) Assist in displaying high sense of humour to gain students' attention.	(a) Encourage the beginning teacher to be flexible (b) assist the beginning teacher to radiate confidence when impacting knowledge. (c) Encourage the beginner to show enthusiasm when teaching.	(a) Encourage the beginner to present a positive image to the management for use in career ladder. (b) Assist in exhibiting reliability. (c) Share when to work with guidance counselor.	(a) Stress the need to have good working relationship with staff. (b) Encourage to be open-minded at work. (c) Discourage pettiness.

	AREAS OF BEGINNING TEACHER'S CONCERN/ NEEDS	GETTING STUDENTS COOPERATION	INSTRUCTION	ADMINISTRATIVE TASKS	SCHOOL/WORKING ENVIRONMENT
10.	Observation	(a) Try to get beginner into good classroom to observe (b) Attempt to get administration involved with and incident.	(a) Arrange for beginners to observe other class rooms in the school. (b) Set up observations with outstanding teachers. (c) Help to analyse teaching and observations in more structured and systematic manner. (d) Hold scheduled conference periods with beginners.	(a) Get permission for beginner to observe teachers conference early in the year.	(a) Encourage beginner to attend scheduled support meetings.

5.5 Development of the Teaching Competence Rating Instrument (TCRI)

The Teaching Competence Rating Instrument was used during observations of the beginning teachers before and after running the mentoring programme.

The TCRI (appendix Q) comprised of fifty- five items grouped into ten teaching competence subscales or dimensions in table 5.2

TABLE 5.2: COMPOSITION OF DIMENSIONS OF TCRI

S/NO	DIMENSIONS INVESTIGATED	NO. OF ITEMS
A	Relationships with students	3
B	Planning	5
C	Subject Knowledge	4
D	Class Management	5
E	Communication	5
F	Evaluation	7
G	Reflecting on Practice	5
H	Professionalism	10
I	Personal Qualities	8
J	Observation	4
	TOTAL	55

All the items describe competence expected of an effective teacher. The items were developed from extensive literature search of research reports, from items used in similar studies in and outside Nigeria and from observations during the initial mentoring scheme (Baiyelo, 1994, Adegoke, 1988; Nwoeu, 1995, Odunusi, 1981; Nzewi, 1986; Wolf, 1994; Tinworth, 1989;Balyelo et-al, 1998).

The TCRI was administered to validate the teacher mentoring programme for the new entrants (TMPNE) into the teaching profession. The observers (the researcher and three trained assistants rated teaching competence of the beginning teachers on a Likert type 5-point scale as follows:

Very Good teaching competence	-	5
Good teaching competence	-	4
Average teaching competence	-	3
Poor Teaching competence	-	2
Very Poor Teaching competence	-	1

For purposes of interpreting the beginning teacher's teaching competence, a specific competence grading scheme was developed from the teaching competence rating instrument. (The teaching competence grading scheme is presented in appendix 5).

5.6 Validation of TCRI

The face validity of the rating instrument was assessed by six experts comprised of two senior research officers with the Nigerian Education and Development Council (NERDC), two lecturers at the University of Lagos and two master science teachers not involved in the initial mentoring scheme. They were asked to determine if the items were appropriate for assessing teaching competence in science subjects. The experts after extensive assessment strongly favoured

the use of the instrument to measure teaching competence before, during and after running the mentoring programme.

5.7 Instruments for Interpreting Beginning Teachers' Performances In Each Teaching Competence Sub-Scales

The following instruments were developed and validated for interpreting beginning teachers performance across the teaching competencies contained in each subscale.

1. Teaching Competence Grading Instrument (TCGI)
2. Teaching Competence Grading Scheme (TCGS)
3. Teaching Competence Discussion Focus Instrument (TCDFI)

They are presented in Appendix R, S, and T^{1-2} respectively.

5.8 Trial-Testing the Teacher Mentoring Programme For New Entrants (TMPNE) Into Teaching Profession.

The TMPNE was assessed for its effectiveness as an induction programme for neophyte teachers using eight schools from four Local Education Districts (LED) of Lagos State not included in the pilot and main study of initial mentoring scheme. The TMPNE is different from the initial mentoring scheme as it takes care of orientation of the beginning teachers and it can also be used for pre-service teachers on practium.

The sample comprised of thirty-two beginning teachers and eight selected mentors. The criteria used in selecting mentors for the initial mentoring scheme was also

used in picking the mentors. The mentors were also trained by the researcher using the training package that was used earlier on in the initial mentoring scheme.

The thirty two beginning teachers were all new entrants to the teaching profession. In fact they were the newly recruited teachers for the 1997/98 session. The trial testing took place in the first term of 1997/98 session specifically from September to December 1997. The thirty-two beginning teachers were randomly grouped into experimental and control group.

Again for uniformity, only mixed schools were sampled. The beginning teachers were observed by the researcher and three assistants using the teaching competence Rating instrument (TCRI) developed by the Researcher to examine their teaching competence. The focus for the discussion of teaching competence during mentoring session is presented in appendix T^{1-2}. The sixteen beginning teachers in the experimental group were later mentored using the Teacher Mentoring Programme for the new entrants (TMPME) into the teaching profession.

The mentoring programme ran for three months (a term) after which all the thirty-two beginning teachers (experimental and control) were observed again using the TCRI to determine the effect of TMPNE.

5.8.1. PERFORMANCES OF THE FIRST YEAR TEACHERS IN THE PRETEST

The first year beginning teachers in the experimental and control group were observed using TCRI.

The mean and standard deviation scores of the beginning teachers were calculated. The independent t-test procedure was employed to ascertain the intellectual equality of the two groups.

The t-test analysis result is provided in table 5.3

TABLE 5.3: COMPARISON OF THE PERFORMANCES OF THE TWO GROUPS OF FIRST YEAR TEACHERS BEFORE ADMINISTRATION OF TMPNE (N=32)

GROUPS	d	d	sd	t	p(0.05)
Experimental	73.8	26.84	5.58	0.16^{ns}	1.645
Control	72.56	26.39	5.95		

The data above indicate no significant differences in the performances of the experimental and control group across the ten dimensions investigated prior to administration of the mentoring programme to the experimental group. The t-value at 5% level of significance is 0.16 and less than p value of 1.645 ($t=0.16$; $p > 0.05$).

This result indicates that the performances of the beginning teachers were at par before the administration of TMPNE.

5.8.2. PERFORMANCES OF THE FIRST YEAR TEACHERS IN THE POST TEST.

INTRODUCTION: The post-test was administered to both experimental and control groups after the exposure of the experimental group to TMPNE. The mean and standard deviation scores of the beginning teachers were computed. Pair-wise t-test analysis was used to determine whether significant difference existed in the performance of the beginning teachers due to TMPNE.

The summary of the t-test result is presented in table 46 while the detailed individual TCRI scores are presented in appendix U^{1-2}.

TABLE 5.4: PAIR-WISE COMPARISON OF THE PERFORMANCES OF THE TWO GROUPS OF FIRST YEAR BEGINNING TEACHERS AFTER EXPOSURE OF ONE TO TMPNE [N =32]

GROUP	n	d	d	sd	t	p(0.05)
Experimental	16	1120	70	24.68	14.09*	1.76*
Control	16	63	3.94	4.42	1.37	1.76

* S = Significant; $p < 0.05$

The data indicates a tremendous improvement on the performances of the experimental group ($t = 14.09$, $p<0.05$) compared to the situation prior to mentoring at ($t = 0.16$, $p>0.05$).

The performance of beginning teachers in the control group was not significant ($t = 1.37$; $P> 0.05$) just like the values obtained for the pre-test ($t = 0.16$; $p>0.05$).

The results show that if the neophites are supported very early in their career, they are likely to be more effective in their classrooms than those left to do "trial and error"

5.8.3 PERFORMANCES OF THE MENTORED FIRST YEAR TEACHERS IN THE PRE AND POST TREATMENT ACROSS THE TEN COMPETENCY DIMENSIONS

INTRODUCTION:

The pre and post treatment performances of the mentored first year teachers were compared across the ten competency dimensions.

The mean ($\bar{d}$) and standard deviation sd scores of the teachers were computed for each dimension. The t – test was also calculated to determine whether significant difference existed across the ten competency dimensions. A summary of the t-test result on differences in the first year teachers' performances for each competency dimension is provided in table 5.5.

The table shows that the first year teachers' performances improved tremendously in all the ten dimensions or subscales. There were significant differences in the

performances of the first year teachers after the administration of TMPNE. The new teachers performance improved very significantly in communication ($t = 3.87$; $p<0.05$), Professionalism ($t = 3.62$; $p< 0.05$), reflecting on practice ($t = 3.49$; $p.<0.05$) and observation techniques ($t = 3.48$; $p.<0.05$) that they were not aware of before the mentoring treatment. However the data indicate a value of $t = 1.85$ in personal qualities dimension which is the lowest in all the ten dimensions. Although the value is low but the performances of the teachers are still significant and greater at five percent level of significance.

TABLE 5.5: COMPARISON OF THE PERFORMANCE OF THE FIRST YEAR TEACHERS IN THE PRE AND POST TREATMENT IN THE TEN COMPETENCY DIMENSIONS

S/NO	DIMENSIONS	NO. OF ITEMS	PRE	PO	d	d^2	d	sd	t	P	REMARKS
1.	Relationship with students	3	65	108	43	1849	14.33	24.83	2.87	1.76	Significant
2.	Planning	5	92	178	86	7376	17.2	38.46	2.77	1.76	Significant
3.	Subject knowledge	4	61	140	79	6214	19.75	39.5	3.14	1.76	Significant
4.	Class Management	5	109	216	107	11449	21.4	47.85	3.09	1.761	Significant
5.	Communication	5	81	248	167	27889	33.4	74.68	3.87	.76	Significant
6.	Evaluation	7	159	264	105	11025	15	39.69	2.38	1.761	Significant
7.	Reflecting on practice	5	80	216	136	18496	27.2	60.82	3.49	.76	Significant
8.	Professionalism	10	235	452	217	5929	21.7	68.62	3.62	1.761	Significant
9.	Personal Qualities	8	241	318	77	5929	9.63	27.22	1.85	.76	Significant
10.	Observation	4	59	162	103	10609	2.55	51.5	3.48	1.76	Significant

The low performance in this dimension is probably due to individual differences among the subjects.

5.9 DISCUSSION OF RESULTS

Based on the analysis of the data gathered, the scores of 32 (experimental group 16 and control group 16) first year teachers showed that:

There existed no significant differences in the performances of the experimental and control group across the ten dimensions investigated prior to administration of the mentoring programme (TMPNE). (0.16; df = 30; p>0.05). This implies that the two groups before the treatment were at par based on the teaching competence dimension characteristics studied. The adduced reason for this could be due to the fact that the two groups were the same intellectually before the researcher started the dyad-teaching competence dimensions treatment. Though there was more spread of scores in the experimental group than in the control group as indicated in the standard deviation.

Another finding shows that the experimental group performances were significant after running the mentoring treatment compared to the control group performance that remained insignificant in the post-test. That is, the finding indicated a tremendous improvement on the performances of experimental group (t = 14.09; df = 14; P <0.05) while control group (t = 1.37; df = 14; p >0.05) maintained the situation obtained in the pre-test. Thus, if the neophite teachers are supported very

early in their career, they are likely to be more effective in their classrooms than those left to do "trial and error" or "sink or swim".

This finding is in line with Anderson and Shanon (1989) postulation that mentor programmes for beginning teachers should be developed with the right definition of mentoring that captures the essence of mentoring relationship. They concluded that if this is not done one runs the risk of developing programmes that are incomplete and lack integrity.

Plausibly, based on the reported finding above, this researcher believed that developers of mentoring programmes must focus on the essential functions of mentoring, identify possible mentoring activities in which these function can be expressed, and must develop the dispositions that mentors are to exhibit as they carry out the functions and activities. Thus, it is believed that it is only when a strong and clear conceptual foundation of mentoring is established can effective mentor programmes be constructed.

Further analysis of the data showed that a significant difference resulted in the pair-wise t-test comparison of the ten competency dimensions of the first year teachers in the pre and post treatment of relationship with students ($t = 2.87$; $df = 14$; $p < 0.05$); planning ($t = 2.77$; $df = 14$; $p < 0.05$); Subject – knowledge ($t = 3.14$; $df = 14$; $p < 0.05$); Class management ($t = 3.09$; $df = 14$; $p < 0.05$; Communication ($t = 3.87$; $df = 14$; $p < 0.05$; Evaluation ($t = 2.38$; $df = 14$; $p < 0.05$; reflecting on practices ($= 3.49$; $df = 14$; $P < 0.05$); Professionalism ($t = 3.62$; $df = 14$; $p < 0.05$;

Personal qualities ($t = 1.85$; $df = 14$; $p<0.05$); and observation ($t = 3.48$; $df = 14$; $p<0.05$) respectively. This implies that after the administration of TMPNE, the fist year teachers' performances improved tremendously in all the ten dimensions, although the personal qualities dimension showed the lowest calculated t – value ($t= 1.85$; $p<.05$) than all the remaining nine dimensions. Perhaps, this could be due to the resultant effects of the individual differences among the subjects.

These findings are consistent with Anderson (1987) study in which he asserted that such mentor – beginner dyad mentoring programme provides the proteges with a sense of what they are becoming, stimulate growth and development, and help in improving into a more skilled and more experienced person.

In the same vein, Levinson, et-al (1978) claimed that mentor – beginner dyad induction programme provides an environment for growth, improves the total personality of the person, and above all nurtured him in deciding how best to be helpful, and operates with a belief that the person being dyad – trained has the capacity to develop into fuller maturity.

CHAPTER SIX

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

6.0 INTRODUCTION:

This chapter is concerned with the presentation of summaries of the research conclusions. Implications and recommendations arising thereof are also discussed.

The main objectives of this study were to

(a) Examine the effects of Teacher Mentoring Programme (TMP) on the Teaching Competence of Beginning Secondary School Science Teachers.

(b) Identify factors that affect or influence the teaching competence of beginning teachers.

(c) Design and trial test a mentoring programme for the induction of new entrants into the teaching profession to enhance their teaching competence.

The design employed was a three - part study, the first part involved a three-phase modified Delphi Survey Technique. The second part employed the design and experimental trial testing of the mentoring programme for beginning teachers in their first, second and third year of entry into the profession.

The third part involved the expansion of the design to include the pre-service teachers on practicum and only neophite first year teachers on the experimental trial testing of the mentoring programme. This is being offered as a panacea in

coming to terms and dealing with transitional problems encountered by new entrants into the teaching profession and indirectly enhance their competence and retention.

6.1 Summary of Findings

The main purpose of this study is to investigate the effects of teacher mentoring programmes on the teaching competence of the beginning secondary school science teachers. To achieve this goal, the researcher postulated four hypotheses to guide the study:

1a. there will be no significant main effect of TMP on the teaching competence of Beginning Secondary School Science Teachers.

b. there will be no significant interaction effect of the variables on the teaching competence of Beginning secondary School Science Teachers.

2. there will be no significant difference in the teaching competence of professional and non-professional secondary school Science Teachers involved in the Mentoring Programme.

3. There will be no significant difference in the teaching competence of beginning teachers involved in the TMP and those not involved.

4. teaching competence of beginning teachers exposed to TMP will not vary by:

   a. educational qualification

   b. length of experience; and

   c. gender.

Eighty subjects (beginning teachers) who were stratifiedly selected into control group (40 subjects) and experimental group (40 subjects) responded to the administered questionnaires for the study.

Three highly- structured researcher – constructed questionnaires viz: Teacher Classification Questionnaire (TCQ) ; Head of Department Perception of status of Beginning Teachers Questionnaire [QHODPBT]; and principal's Perception of status of Beginning Teachers Questionnaire [QPPBT] were used to elicit information from the respondents.

Based on these analyses, the scores of 40 subjects in experimental and 40 subjects in control groups show that:

a) The TMP had a positive significant effects on the teaching competence of the beginning teachers as their teaching competence were significantly improved after mentoring.

b) The TMP significantly improved the teaching competence of both trained and untrained teachers but the trained teachers out-performed the untrained ones.

c) The teachers that were mentored were significantly more competent than those not mentored.

d) Teacher mentoring fostered significantly the development of teaching competence in beginning secondary school science teachers irrespective of the qualification obtained.

e) Mentoring had positive effect on teaching competence of all teachers exposed to it whether males or females.

f) All the teachers that were mentored displayed improved teaching competence irrespective of the number of years of experience.

g) Teacher Education at whatever level (pre-service and in-service) are all deficient without mentoring. In other words they fall short of professional standards attainable through mentoring.

6.2 Conclusions:

This study has succeeded in identifying the positive contribution of teacher support through mentoring in enhancing the teaching competence of beginning secondary school science teachers.

The design, validation and trial testing of a teacher mentoring programme for new entrants' induction into the teaching profession was also accomplished. The programme was also proposed for pre-service teachers on practicum.

The study identified the need for novice teachers and student teachers to have mentors. Finally mentoring would empower the mentor involved to share their vision of teaching and embrace an openness to lifelong professional growth.

6.3 Implication of the Study:

A major problem that initiated this research is the poor quality of induction and supervision of new recruits into the teaching profession. This study has found and established that there is a positive significant relationship between teacher support and teaching competence of new teachers.

This study has some basic implications for pre-service and in-service teacher education.

The study has implications for pre-service programme developers. A growing body of evidence (e.g. Amodu 1997; Baiyelo,1993; Elbaz, 1990; Nwosu, 1995; Oke, 1998) suggests that separating the teacher from his teaching (i.e. the cognitive behavioural performance) is impossible. In the same vein, new teachers are loaded with theories about teaching that owe their origins to an apprenticeship of observation (Lortie, 1975; Clark, 1988). With this in mind life history and life story methodologies that join personal and professional aspects of teachers' lives, work and identities merit closer attention in the design and conduct of pre-service programmes, for identity construction and maintenance are central components in teacher induction.

Another implication arising from this study is for

> educational policy makers to see the need to view the teacher as a professional in his own right comparable to other 'esteemed professionals' (e.g. legal and medical practitioners) in including a formal period of

internship for newly recruited teachers as done in other professions. Teaching is probably the only profession that expects its beginners to be responsible for the same work expected of experienced veterans right from the first day. The need arises for a period of active induction during which the recruit relies on experienced colleagues for quality support through mentoring.

Yet another implication of this study is

the possibility for school systems to create a new role for teachers as in service teacher trainers. Such a role will legitimate the explicit shift for the induction responsibility of beginning teachers from arranged off-school sites to the school. The classroom teacher then becomes a "clinical professor".

The study has also exposed a grave implication in the issuance of definitive certificate of competence for a beginning teacher just out of collegiate training. The acquisition of minimal competence in teaching i.e. the development of skills in teaching requires a considerable period of time, at least several years from the time of beginning practice. Therefore, the issuance of a definitive certificate of competence should take place only after several years of experience in the school and not upon immediate graduation from college. A broader authorisation might well be postponed until a wider repertoire of skills has been developed and if possible renewal should be done at intervals of five years.

6.4 Recommendations:

Based on the conclusions drawn from this study the following recommendations were made:

1. The Teacher Mentoring Programme for New Entrants (TMPNE) into the teaching profession developed and trial tested with the 55 – item teaching competence skills inventories, should be incorporated into the induction programme of recruits and pre-service teachers on practicum.

2. Pre-service programmes should be strengthened to prepare teachers more adequately for the first year as well as for a long-term career in teaching.

3. Just as adult learning theory suggests that adults learn more readily when they have the opportunity to interact with peers (Sprinthall and Thies – Sprinthall, 1983), beginning teacher induction should include the formation of a functional cohort group for sharing ordeals, to understand that others are experiencing the same stressful period and to foster their professional growth.

4. The experienced teachers to serve as mentors should be paid stipends. Asking mentor teachers to embark on this task (of supporting neophytes) as an "add on" without supporting their work either through monetary rewards or release time will doom the effort to failure.

5. Research efforts need to be intensified towards rigorous gathering of classroom data to further determine the effectiveness of the teacher mentoring programme, particularly using variables that are shown to be related to students' achievement growth.

6. Teacher trainers in Nigerian colleges of Education and Universities should collaborate with the Local Education Districts to provide research based and effective instructional support system considered crucial to the beginning teachers' success.

6.5 Limitations of the Study:

(a) The study was restricted to the beginning secondary school science teachers whereas all the beginning teachers should be supported through mentoring to meet their early career needs irrespective of discipline. Ideally all the beginning teachers across all disciplines should be mentored.

(b) The list of teaching competence in the TMP and TMPNE is not an exhaustive list of teaching competence for enhancing the beginning teacher induction into the teaching profession.

(c) The teacher mentoring programme developed in this study was trial-tested only in Lagos State.

(d) The dyad training package – a teacher mentoring induction programme for new entrants and pre-service teachers on practicum developed was trial tested using only the first year teachers and in only Lagos State.

6.6 Suggestions for Further Study:

The limitations and implications of this study necessitate the call for further studies in the following areas:

(a) Research efforts must be geared towards investigating the effectiveness of teacher mentoring programmes for induction of beginning teachers in all disciplines.

(b) Beginning secondary school science teachers from only Lagos State were involved in the study. Beginning secondary school science Teachers in Lagos State may differ in their perception of teacher support through mentoring to enhance teaching competence. It is therefore suggested that future research efforts in this area should be extended to teachers across a representative sample of states in Nigeria.

(c) The teacher mentoring programme was trial-tested only in Lagos State. Further studies are needed to trial-test the programme in other States to determine its effectiveness for the pre-service, induction and in-service education of teachers.

(d) The dyad training package, a form of teacher mentoring programme (TMPNE) proposed for induction of new recruits was tested only in Lagos State and on first year teachers. Future research efforts are needed to trial test the TMPNE for pre-service teachers on practicum with the co-operating teachers serving as mentors.

(e) Research efforts should also be geared towards investigating the relationship between teacher support through mentoring and teacher retention.

(f) Research studies are also needed to monitor and track inductees' attitudes as they begin full time teaching during their first year i.e. the nature and sources of pre-professional educator's expectation that he/she will make an excellent teacher from day one and even with intention to change the whole education system in a few years!

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THESES AND DISSERTATION

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APPENDIX A

TEACHER CLASSIFICATION QUESTIONNAIRE [TCQ]

DIRECTION: Please answer the following questions by ticking the option that best describes your opinion. Where a line is provided, write your answer.

1. Name of School: .....

2. Age of Teacher:

   20-30 ☐ 30-40 ☐ 40-50 ☐ Above 50 ☐

3. Gender:

   Male ☐ Female ☐

4. Marital Status:

   Single ☐ Married ☐

5. Responsibilities in the School:

   (a) Head of Science Department ☐ (b) Head of Physics Unit ☐

   (c) Head of Chemistry Unit ☐ (d) Head of Biology Unit ☐

   (b) Head of Mathematics Unit ☐ (f) Head of Agricultural Unit ☐

   (c) Subject Teacher ☐

6. Qualification with dates.

   NCE ☐ B.Sc ☐ B.Sc (EDUC) ☐ B.Ed ☐

   HND ☐ ND ☐ M.Ed ☐

7. Teaching Experience: (Years)

0 – 2 ☐ 3 – 5 ☐ 6 - 10 ☐ 11-15 ☐

16-20 ☐ Above 20 ☐

8. Subject (s) specialised in .....

9. Subject being taught .....

10. Other responsibility given at school.....

11. Area of Specialisation of Principal .....

12. Area of Specialisation of Vice Principal .....

13. When did you receive the last visit or inspection by the State Officials.

This year ☐ Last year ☐

One or two years ago ☐ More than two years ☐

Cannot remember ☐

14. Who does the Supervision of each subject?

Subject Specialist ☐ Non- Subject Specialist ☐

15. Do you write notes of lessons?

Yes ☐ No ☐

16. Who Inspects your notes of lesson?

Principal ☐ Vice Principal ☐

Head of science Department ☐ Head of Unit ☐

Others ☐ None ☐

17. When you joined the Teaching Service did you undergo any initial induction course? .....

18. Do you derive enjoyment in teaching?

Yes ☐ No ☐

19. Would you rather be in another type of employment?

20. How often do you hold department of unit meeting?

(a) Weekly ☐ Fortnightly ☐

(b) Monthly ☐ Anytime ☐

(c) None ☐

21. Do you consult experienced colleagues when faced with difficulty in your classroom teaching?

Yes ☐ No ☐

APPENDIX B

HEAD OF DEPARTMENT PERCEPTION OF STATUS OF BEGINNING SCIENCE TEACHERS QUESTIONNAIRE [QHODPBT]

DIRECTION: Each of the statements written below describes problems and status of beginning science teachers. Please rate the beginning teachers performance on the scale provided.

		Excellent	Very Good	Good	Poor	Very Poor
		5	4	3	2	1
1.	The teacher's lesson planning is adequate					
2.	The teacher shows mastery of subject matter					
3.	The teacher radiates self confidence					
4.	The teacher constructs, improves and uses learning –teaching aids in science appropriately and adequately.					
5.	Teacher works co-operatively with other subject teachers					
6.	Teacher attends lessons punctually					

7.	Teacher always makes sure that the laboratory equipment are in good working conditions before allowing students to use them					
8.	Teacher uses different teaching methods					
9.	Teacher gives adequate assignment and grades it regularly.					
10.	Teacher is comfortable with topics that involve mathematical concepts and principles					
11.	The teacher employs effective classroom management technique					
12.	Teacher involves students in practical activities in all practical oriented topics.					

APPENDIX C

THE PRINCIPALS' PERCEPTION OF BEGINNING TEACHERS' STATUS [QPPBT]

DIRECTION: Each of the statements written below describes problems and status of beginning science teachers. Please rate the beginning teachers performance on the scale provided.

		Excellent	Very Good	Good	Poor	Very Poor
		5	4	3	2	1
1.	The teacher prepares and organises his lessons adequately					
2.	The teacher shows mastery of subject matter					
3.	Teacher maintains a cordial relationship with other teachers					
4.	Teacher radiates self confidence					
5.	Teacher attends lessons punctually					
6.	Teacher considers students' individual differences in planning and teaching lessons.					
7.	Teacher's views on teaching as a life-long profession.					

8.	The teacher makes his students to like and respect him.					
9.	The teacher employs effective classroom management technique					
10.	Teacher constructs, improves and uses learning teaching aids in sciences adequately.					

APPENDIX D

BEGINNING TEACHER INTERVIEW SCHEDULE [BTIS]

1. You have been teaching now for a short while and you have probably had time to reflect on the experience. Given this rating scale, how would you say things are going for you?

Extremely Difficult	1	2	3	4	5	Extremely Easy

2. You have indicated that this 'short while' as a teacher has been ..... for you. Realising that teaching encompasses many aspects, i would like you to reflect in detail on some of your successes. Can you be more explicit about .....?

3. Many professionals in education recognise that a beginning teacher has many problems to deal with at the initial stage. The following are some area that other teachers have identified as problems and concerns. Please sort these into five categories: Extremely difficult, difficult, Easy, Very Easy, Extremely easy.

[Indicate by ticking the corresponding Figure].

		5	4	3	2	1
1.	Characteristics of good teaching.					
2.	Decision about teaching methods.					
3.	Administrative tasks.					
4.	Personal characteristics of colleagues.					
5.	Classroom Discipline					
6.	Classroom organisation.					
7.	Materials/ Resources.					
8.	Getting Information.					
9.	Relationship with experienced colleagues.					
10.	Implementing instructions.					
11.	Motivation					
12.	Planning					
13.	Relationship with students.					
14.	Evaluation.					

4. let us discuss some of your concerns. You identified..... as a concern. Can you say more about it?

5. suppose you were put in a position of being a helper for a beginning teacher. How would you help this teacher? What would be the most important things to do?

6. In the first few years of teaching, the beginning teacher learns a great many important things.

   What are some things you have learnt that you needed to know? What ideas about teaching have changed the most?

7. what advice would you give a beginning teacher based on your experience?

APPENDIX E

COMPETENCY SKILLS EXPECTED OF SECONDARY SCHOOLS SCIENCE TEACHERS [CSC]

DIRECTION: Tick the skills observed

1. possesses a sound science subject matter background
2. plans and organises instruction.
3. Incorporates effective the laboratory activities into instruction
4. Teaches science using the inquiry process and discovery approaches.
5. Demonstrate the ability to communicate effectively.
6. Uses a variety of instructional strategies and techniques.
7. Relates science to society.
8. Employs effective classroom management techniques.
9. Provides for individual differences.
10. Relates psychological development with the learning of science subject matter.
11. Employs evaluation skills.
12. Possesses a background in mathematics.
13. Provides a humanly supportive environment.
14. Knowledgeable about various science curricula.
15. Possesses a knowledge of the history and philosophy of science and its social implications

APPENDIX F

SCIENCE TEACHING OBSERVATION SCHEDULE

Name:.....

CHER TALK

Class observed.....

		0	3	6	9	12	15	19	21	2	27
cher asks questions (or invites comments) which are answered by:											
recalling facts and principles	21										
applying facts and principls to problem solving	22										
making hypothesis or speculation	23										
designing of experimental procedure	24										
direct observation	25										
interpreation of observed or recorded data	26										
making inferences from observations or data	27										
her makes statements:											
of facts and principle	b1										
of problems	b2										
of hypothesis or speculation	b3										
of experimental procedure	b4										
cher directs pupils to sources of formation for the purpose of:											
acquiring or confirming facts or principles	c1										
Identifying or solving problems	c2										
making inferences, formulating or testing hypotheses	c3										
seeking guidance on experimental procedure	c4										

LK AND ACTIVITY INITIATED AND/OR MAINTAINED BY PUPILS

seek information or consult for the purpose of	d1										
acquiring or confirming facts or principles)	d2										
Identifying or solving problems)											
making inferences, formulating or testing)											
hypotheses)	d3										
seeking guidance on experimental procedure	d4										
Its refer to teacher for the purpose of:											
acquiring or confirming facts or principles	e1										
seeking guidance when identifying or solving problems	e2										
seeking guidance when making inferences, formulating or testing hypotheses	e3										
seeking guidance on experimental procedure	e4										

APPENDIX G[1]

TABLE SHOWING PERFORMANCES OF THE BEGINNING TEACHER NOT MENTORED (CONTROL GROUPS) IN THE PRE AND POST TEST [N=16]

TEACHER NO.	Pre-test	Post-test	Post-Pre	d	d^2
1	8	14	14-8	6	36
2	8	13	13-8	5	25
3	7	12	12-7	5	25
4	7	10	10-7	3	9
5	8	9	9-8	1	1
6	8	9	9-8	1	1
7	8	9	9-8	1	1
8	10	11	11-10	1	1
9	11	10	10-11	-1	1
10	7	12	12-7	5	25
11	9	13	13-9	4	16
12	9	11	11-9	2	4
13	10	11	11-10	1	1
14	9	14	14-9	5	25
15	7	10	10-7	3	9
16	6	13	13-6	7	49
Total	**132**	**181**	**49**	**49**	**228**

APPENDIX G^2

TABLE SHOWING PERFORMANCES OF THE BEGINNING TEACHER NOT MENTORED (CONTROL GROUPS) IN THE PRE AND POST TEST [N=16]

TEACHER NO.	Pre-test	Post-test	Post-Pre	d	d^2
1	6	9	9-6	3	9
2	5	6	6-5	1	1
3	5	9	9-5	4	16
4	6	8	8-6	2	4
5	10	6	6-10	-4	16
6	5	10	10-5	5	25
7	8	8	8-8	0	0
8	6	7	7-6	1	1
9	7	8	8-7	1	1
10	8	8	8-8	0	0
11	9	9	9-9	0	0
12	8	8	8-8	0	0
13	8	8	8-8	0	0
14	9	9	9-9	0	0
15	7	6	6-7	-1	1
16	7	5	5-7	-2	4
TOTAL	**114**	**124**	**10**	**10**	**57**

APPENDIX H[1]

TABLE SHOWING COMPARISON OF THE PROFESSIONAL BEGINNING TEACHERS MENTORED [N=10]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
1	8	14	14-8	6	36
2	8	13	13-8	5	25
4	7	10	10-7	3	9
6	8	9	9-8	1	1
9	11	10	10-11	-1	1
10	7	12	12-7	5	25
11	8	13	13-8	5	25
12	9	11	11-9	2	4
13	10	11	11-10	1	1
14	9	14	14-9	5	25
TOTAL	**85**	**117**	**32**	**32**	**151**

APPENDIX H^2

TABLE SHOWING COMPARISON OF THE NON-PROFESSIONAL BEGINNING TEACHERS MENTORED [N=6]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
5	8	9	9-8	1	1
7	8	9	9-8	1	1
10	7	12	12-7	5	25
11	9	13	13-9	4	16
13	9	11	11-9	2	4
15	7	10	10-7	3	9
TOTAL	**48**	**64**	**16**	**16**	**56**

APPENDIX I[1]

TABLE SHOWING PERFORMANCES OF THE N.C.E TEACHERS IN THE MENTORED IN THE EXPERIMENTAL GROUP [N=7]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
2	8	13	13-8	5	25
3	7	12	12-7	5	25
6	8	9	9-8	1	1
7	8	9	9-8	1	1
12	9	11	11-9	2	4
14	9	14	14-9	5	25
16	6	13	13-6	7	49
TOTAL	**55**	**31**	**26**	**26**	**130**

APPENDIX I[2]

TABLE SHOWING PERFORMANCES OF THE UNIVERSITY GRADUATE TEACHERS MENTORED [N=5]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
1	8	14	14-8	6	36
4	7	10	10-7	3	9
5	8	9	9-8	1	1
11	7	13	13-7	6	36
13	10	11	11-10	1	1
TOTAL	**40**	**57**	**17**	**17**	**83**

TABLE SHOWING PERFORMANCES OF THE POLYTECHNIC GRADUATE TEACHERS MENTORED [N=4]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
8	9	11	11-9	2	4
9	10	11	11-10	1	1
10	7	12	12-7	5	25
15	7	10	10-7	3	9
TOTAL	**33**	**44**	**11**	**11**	**39**

APPENDIX J

TABLE SHOWING PERFORMANCES OF FEMALE BEGINNING TEACHERS MENTORED [N=9]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
1	8	14	14-8	6	36
3	7	12	12-7	5	25
4	7	10	10-7	3	9
5	8	9	9-8	1	1
7	8	9	9-8	1	1
8	9	11	11-9	2	4
10	7	12	12-7	5	25
12	9	11	11-9	2	4
16	6	13	13-6	7	49
TOTAL	**69**	**101**	**32**	**32**	**154**

TABLE SHOWING PERFORMANCES OF MALE BEGINNING TEACHERS MENTORED [N=7]

TEACHER No.	Pre	Po	Po-Pre	d	d^2
2	8	13	13-8	5	25
6	8	9	9-8	1	1
9	11	10	10-11	-1	1
11	7	13	13-7	6	36
13	10	11	11-10	1	1
14	9	14	14-9	5	25
15	7	10	10-7	3	9
TOTAL	**60**	**80**	**20**	**20**	**97**

SCIENCE TEACHING OBSERVATION SCHEDULE FOR 370 SUBJECTS

a1	117	130	75	27	14	12	7	5	53	35	32	507	46.031	16.9	24019801	27.836	9.5749
a2	16	65	57	52	63	87	33	42	15	44	36	510	46.364	17	248048	28.001	6.7492
a3	13	15	17	21	6	3	12	8	6	4	10	115	10.455	3.8333	123580277	6.3138	1.6154
a4	3	2	4	11	13	5	11	9	8	7	11	84	7.6364	2.8	659344	4.6119	1.13
a5	13	11	15	14	26	23	19	8	7	11	14	161	14.636	5.3667	2422173444	8.3394	2.0445
a6	16	9	27	19	12	17	21	15	13	13	20	182	16.545	6.0667	3095253778	9.9923	2.1706
a7	5	3	4	6	13	9	11	43	24	39	7	164	14.909	5.4667	2513281778	9.0041	3.1045
b1	117	129	78	89	81	63	82	33	97	72	55	896	81.455	29.867	750185951	49.193	10,864
b2	9	10	6	7	13	5	22	11	12	6	4	105	9.5455	3.5	10302.25	5.7648	1.4599
b3	6	12	15	37	7	33	16	49	33	15	10	233	21.182	7.7667	507300444	12.792	3.6043
b4	4	15	16	4	23	22	24	10	7	14	6	145	13.182	4.8333	1954669444	7.8609	2.0778
c1	25	26	14	12	9	27	10	22	7	20	12	184	16.727	6.1333	3163656111	10.102	2.3994
c2	9	7	14	12	11	5	32	23	35	15	10	174	15.818	5.8	28291 24	9.5531	2.5913
c3	8	23	12	15	14	13	33	10	11	27	14	180	16.364	6	30276	9.8825	2.4083
c4	21	24	7	9	10	13	27	15	6	15	16	163	14.818	5.4333	2462725444	8.9492	2.1556
d1	8	6	13	16	9	5	3	10	18	17	13	118	10.727	3.9333	1301120444	5.4786	1.5698
d2	19	20	17	18	16	13	12	10	15	10	16	166	15.091	5.5333	2574955111	9.1189	1.9039
d3	13	7	11	10	12	9	3	16	11	9	12	118	10.727	3.9333	1301120444	8.4786	1.3583
d4	10	12	3	7	6	8	10	3	5	2	9	75	6.8182	2.5	525625	4.1177	1.0076
e1	3	13	3	15	6	13	10	9	7	12	11	102	9.2727	3.4	972196	5.6001	1.3266
e2	6	15	8	9	8	7	11	5	6	9	10	94	8.5455	3.1333	8256751111	5.1609	1.1372
e3	8	10	12	16	11	15	14	10	12	4	8	120	10.909	4	13456	6.5884	1.4436
e4	7	9	15	7	9	10	12	5	3	7	6	90	8.1818	3	7569	4.9418	1.1458

APPENDIX L[1]

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE EXPERIMENTAL GROUP IN THE PRE TEST AND POST TEST [N=40]

TEACHER No.	Pre	po	Po-Pre	d	d^2
1	6	7	7-6	1	1
2	9	15	15-9	6	36
3	7	13	13-7	6	36
4	5	8	8-5	3	9
5	7	12	12-7	5	25
6	6	10	10-6	4	16
7	9	10	10-9	1	1
8	7	11	11-7	4	16
9	4	7	7-4	3	9
10	9	11	11-9	2	4
11	4	8	8-4	4	16
12	5	15	15-5	10	100
13	8	10	10-8	2	4
14	9	13	13-9	4	16
15	5	14	14-5	9	81
16	6	8	8-6	2	4
17	4	14	14-4	10	100
18	5	11	11-5	6	36
19	7	13	13-7	5	25
20	5	10	10-5	5	25
21	5	10	10-5	5	25
22	7	14	14-7	7	49
23	9	9	9-9	0	0
24	8	10	10-8	2	4
25	8	13	13-8	5	25
26	7	11	11-7	4	16
27	6	9	9-6	3	9
28	3	9	9-3	6	36
29	6	10	10-6	4	16
30	5	12	12-5	7	49
31	5	14	14-5	9	81
32	4	7	7-4	3	9
33	6	11	11-6	5	25
34	8	8	8-8	0	0
35	4	9	9-4	5	25
36	3	11	11-3	8	64
37	8	7	7-8	-1	1
38	4	11	11-4	7	49
39	5	10	10-5	5	25
40	6	12	12-6	6	36
TOTAL	**242**	**429**	**182**	**182**	**1103**

APPENDIX L^2

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE CONTROL GROUP IN THE PRE TEST AND POST TEST [N=40]

TEACHER No.	Pre	po	Po-Pre	d	d^2
1	6	7	7-6	1	1
2	7	4	4-7	-3	9
3	9	4	4-9	-5	25
4	6	6	6-6	0	0
5	6	8	8-6	2	4
6	5	5	5-5	0	0
7	5	8	8-5	3	9
8	6	8	8-6	2	4
9	7	4	4-7	-3	9
10	6	6	6-6	0	0
11	9	7	7-9	-2	4
12	8	6	6-8	-2	4
13	8	8	8-8	0	0
14	7	8	8-7	1	1
15	8	7	7-8	-1	1
16	6	9	9-6	3	9
17	8	8	8-8	0	0
18	8	9	9-8	1	1
19	5	8	8-5	3	9
20	8	7	7-8	-1	1
21	5	5	5-5	0	0
22	7	8	8-7	1	1
23	5	8	8-5	3	9
24	3	6	6-3	3	9
25	6	9	9-6	3	9
26	9	9	9-9	0	0
27	7	9	9-7	2	4
28	6	8	8-6	2	4
29	5	7	7-5	2	4
30	9	5	5-9	-4	16
31	4	9	9-4	5	25
32	7	7	7-7	0	0
33	8	7	7-8	-1	1
34	4	6	6-4	2	4
35	7	6	6-7	-1	1
36	6	6	6-6	0	0
37	6	5	5-6	-1	1
38	3	5	5-3	2	4
39	5	4	4-5	-1	1
40	4	3	3-4.	-1	1
TOTAL	**254**	**272**	**15**	**15**	**185**

APPENDIX M[1]

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE CONTROL GROUP IN THE PRE TEST AND POST TEST [N=26]

TEACHER No.	Pre	po	Po-Pre	d	d^2
3	7	13	13 – 7	6	36
5	7	12	12 – 7	5	25
7	9	10	10 – 9	1	1
10	9	11	11 – 9	2	4
12	5	15	15 – 5	10	100
15	5	14	14 – 5	9	81
17	4	14	14 – 4	10	100
18	5	11	11 – 5	6	36
20	5	10	10 – 5	5	25
21	5	10	10 – 5	5	25
22	7	14	14 – 7	7	49
23	9	9	9 – 9	0	0
24	8	10	10 – 8	2	4
25	8	13	13 – 8	5	25
26	7	11	11 – 7	4	16
27	6	9	9 – 6	3	9
29	6	10	10 – 6	4	16
30	5	12	12 – 5	7	49
33	6	11	11 – 6	5	25
34	8	8	8 – 8	0	0
35	4	09	9 – 4	5	25
36	3	11	11 – 3	8	64
37	8	7	7 – 8	-1	1
38	4	11	11 – 4	7	49
39	5	10	10 – 5	5	25
40	6	12	12 – 6	6	36
TOTAL	**161**	**283**	**126**	**126**	**825**

APPENDIX M^2

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE NON-PROFESSIONAL TEACHERS IN THE PRETEST AND POST TEST[N = 14]

TEACHER No.	Pre	po	Po-Pre	d	d^2
1	6	7	7-6	1	1
2	9	15	15-6	9	81
4	5	8	8-5	3	9
6	7	13	13-7	6	36
9	4	7	7-4	3	9
11	4	8	8-4	4	16
13	8	10	3-8	2	4
14	9	13	13-9	4	16
16	6	8	8-6	2	4
19	7	13	13-7	6	36
28	3	9	7-3	6	36
29	6	10	10-6	4	16
31	5	14	14-5	9	81
32	4	11	11-4	7	49
TOTAL	**83**	**146**	**63**	**63**	**349**

APPENDIX N[1]

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE N.C.E CERTIFICATE HOLDERS IN THE PRE TEST AND POST TEST [N=19]

TEACHER No.	Pre	po	Po-Pre	d	d^2
3	7	13	13-7	6	36
5	7	12	12-7	5	25
7	9	10	10-9	1	1
10	9	11	11-9	2	4
12	5	15	15-5	10	100
15	5	14	14-5	9	81
18	5	11	11-5	6	36
20	5	10	10-5	5	25
21	5	10	10-5	5	25
22	7	14	14-7	7	49
23	9	9	9-9	0	0
24	8	10	10-8	2	4
25	8	13	13-8	5	25
27	6	9	9-6	3	9
29	6	10	10-6	4	16
30	5	12	12-5	7	49
34	8	8	8-8	0	0
35	4	9	9-4	5	25
39	5	10	10-5	5	25
TOTAL	**123**	**206**	**93**	**93**	**535**

APPENDIX N^2

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE UNIVERSITY GRADUATE IN THE PRE TEST AND POST TEST

TEACHER No.	Pre	po	Po-Pre	d	d^2
2	9	15	15-9	6	36
19	7	13	13-7	6	36
9	4	7	7-4	3	9
11	4	8	8-4	4	16
31	5	14	14-5	9	81
17	4	14	14-4	10	100
26	7	11	11-7	4	16
33	6	11	11-6	5	25
36	3	11	11-3	8	64
37	8	7	7-8	-1	1
38	4	11	11-4	7	49
40	6	12	12-6	6	36
TOTAL	**67**	**134**	**67**	**67**	**468**

APPENDIX N^3

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE POLYTECHNIC GRADUATES IN THE PRE TEST AND POST TEST

[N=9]

TEACHER No.	Pre	po	Po-Pre	d	d^2
1	6	7	7-6	1	1
4	5	8	8-5	3	9
6	7	13	13-7	6	36
28	3	9	9-3	6	36
14	9	13	13-9	4	16
16	6	8	8-6	2	4
13	8	10	10-8	2	4
32	6	10	10-8	4	16
38	4	11	11-4	7	49
TOTAL	**54**	**89**	**35**	**35**	**171**

APPENDIX O[1]

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE MALE TEACHERS IN THE PRE TEST AND POST TEST [N=17]

TEACHER No.	Pre	po	Po-Pre	d	d^2
1	6	7	7-6	1	1
3	7	13	13-7	6	36
4	5	8	8-5	3	9
5	7	12	12-7	5	25
9	3	9	9-3	6	36
14	9	13	13-9	4	16
15	5	14	14-5	11	121
20	5	10	10-5	5	25
23	9	9	9-9	0	0
24	8	10	10-8	2	4
25	8	13	13-8	5	25
26	7	11	11-7	4	16
27	6	9	9-6	3	9
29	6	10	10-6	4	16
30	5	12	12-5	7	49
35	4	9	9-5	4	16
36	3	11	11-3	8	64
TOTAL	**103**	**180**	**78**	**78**	**468**

APPENDIX O^2

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE FEMALE TEACHERS IN THE PRE TEST AND POST TEST

TEACHER No.	Pre	po	Po-Pre	d	d^2
2	9	15	15-9	6	36
6	7	13	13-7	6	36
7	9	10	10-9	1	1
8	4	11	11-4	7	49
10	9	11	11-9	2	4
11	4	8	8-4	4	16
12	5	15	15-5	10	100
16	6	8	8-6	2	4
17	4	14	14-4	10	100
18	5	11	11-5	6	36
19	7	13	13-7	6	36
20	5	10	10-5	5	25
21	5	10	10-5	5	25
22	7	14	14-7	7	49
24	8	10	10-8	2	4
25	6	10	10-6	4	16
31	5	14	14-5	9	81
32	4	7	7-4	3	9
33	6	11	11-6	5	25
34	8	8	8-8	0	0
37	8	7	7-8	-1	1
38	4	11	11-4	7	49
40	6	12	12-6	6	36
TOTAL	**141**	**253**	**112**	**112**	**737**

APPENDIX P[1]

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE FIRST YEAR TEACHERS IN THE PRE TEST AND POST TEST [N=19]

TEACHER No.	Pre	po	Po-Pre	d	d^2
22	7	14	14-7	7	49
27	6	9	9-6	3	9
39	6	10	10-6	4	16
15	5	15	15-5	10	100
20	5	10	10-5	5	25
24	8	13	13-8	5	25
34	8	8	8-8	0	0
18	5	11	11-5	6	36
19	7	13	13-7	6	36
9	4	7	7-4	3	9
11	4	8	8-4	4	16
26	7	11	11-7	4	16
40	6	12	12-6	6	36
38	4	11	11-4	7	49
13	8	10	10-8	2	4
4	5	8	8-5	3	9
1	6	7	7-1	6	36
14	9	13	13-9	4	16
16	6	8	8-6	2	4
TOTAL	**116**	**198**	**82**	**82**	**456**

APPENDIX P^2

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE SECOND YEAR TEACHERS IN THE PRE TEST AND POST TEST [N=15]

TEACHER No.	Pre	po	Po-Pre	d	d^2
30	5	12	12-5	7	49
2	9	15	15-9	6	36
17	4	14	14-4	10	100
36	3	11	11-3	8	64
3	7	13	13-7	6	36
5	7	12	12-7	5	25
7	9	10	10-9	1	1
10	9	11	11-9	2	4
12	15	5	15-5	5	25
27	5	10	10-5	5	25
23	9	9	9-9	0	0
25	8	13	13-8	5	25
35	4	9	9-4	5	25
39	5	10	10-5	5	25
30	5	12	12-5	7	49
TOTAL	**694**	**176**	**82**	**82**	**489**

APPENDIX P^3

TABLE SHOWING COMPARISON OF THE PERFORMANCES OF THE THIRD YEAR TEACHERS IN THE PRE TEST AND POST TEST [N=6]

TEACHER No.	Pre	po	Po-Pre	d	d^2
18	5	11	11-5	6	36
39	5	10	10-5	5	25
31	5	14	14-5	9	81
33	6	11	11-6	5	25
37	8	7	7-8	-1	1
32	6	10	10-6	4	16
TOTAL	**35**	**63**	**29**	**29**	**182**

APPENDIX Q

TEACHING COMPETENCE RATING INSTRUMENT (TCRI)

A. Relationship with Students

		Very Good	Good	Average	Poor	Very Poor
		5	4	3	2	1
1.	Ability to secure students' attention.					
2.	Response to individuals and class as a whole.					
3.	Exercise control by encouragement and reception of ideas.					
B.	**PLANNING**					
4.	Select learning and objectives, content and activities appropriate to age and abilities of students.					
5.	Set appropriately demanding expectations for all students.					
6.	Demonstrate the ability to select and use appropriate reference materials and resources.					
7.	Produce coherent lesson plans in subject which take account of examination syllabuses, courses, school and departmental policies.					
8.	Demonstrate an awareness, in short and medium planning, of the needs of students of all abilities.					
C.	**SUBJECT KNOWLEDGE**					
9.	Demonstrate depth and breadth of subject knowledge.					

10.	Show a thorough knowledge of the nature, and structure and place of the subject in N.P.E.					
11.	Build on students' questions to further their knowledge and understanding.					
12.	Cops readily with most subject-related questions and problems which students raises.					
D.	**CLASS MANAGEMENT**					
13.	Plan and teach for continuity and progression within the subject, for individual, pupils and groups within classes and between years.					
14.	Use a range of teaching strategies appropriate to the subject matter and to the age, abilities and attainment of student.					
15.	Demonstrate an understanding of progression in pupil's knowledge understanding and skills in the subject.					
16.	Demonstrate flexibility and knowledge of " ladder " of discipline.					
17.	Work to foster concentration and perseverance in all students.					
E.	**COMMUNICATION**					
18.	Present subject content accurately, coherently and clearly.					
19.	Use appropriate scientific language.					
20.	Engage students in activities which contribute to the development of their communication skills.					

21.	Communicate an enthusiasm for the subject which interests, motivates and challenges student, and stimulates their enquiry within the subject.					
22.	Communicate effectively with students using a range of styles, such as instruction, questioning, discussing and providing feedback.					
F.	**EVALUATION**					
23.	Encourage students, where appropriate aspects of their own learning.					
24.	Select and use appropriate methods for regular and systematic assessment and recording of students' progress in all aspects of the subject.					
25.	Use such assessment to inform teaching.					
26.	Mark students' work regularly using agreed criteria and provide timely and appropriate oral and written feedback.					
27.	Work with other teachers to ensure consistency in judgements of students' attainments.					
28.	Show familiarity with statutory reporting requirements and provide appropriate written and oral reports to parents.					
29.	Report appropriately to others concerned with students' progress.					

G.	**REFLECTING OF PRACTICE**					
30.	Demonstrate thorough preparation reflection in a well presented and carefully arrange record.					
31.	Adapt schemes to meet students' response and needs.					
32.	Lesson appraisal shows considerable awareness and insight.					
33.	Display clear evidence of willingness and ability to respond to advice.					
34.	Perceptive in evaluating own teaching.					
H.	**PROFESSIONALISM**					
35.	Demonstrate an understanding of the school as an institution and its place within the community.					
36.	Demonstrate a working knowledge of the pastoral, contractual legal and administrative responsibilities of teachers.					
37.	Demonstrate an understanding of the work of external agencies supporting them.					
38.	Have effective working relationship with professional colleagues, support staff, parents and others.					
40.	Have command of appropriate communication skills.					
41.	Show an awareness of individual differences including social, psychological development and cultural dimensions.					

42.	Apply the above knowledge sensitively when dealing with individuals and groups.					
43.	Recognise the diversity of talents and needs present in the school and how to deal with them (e.g. gifted students).					
44.	Recognise and use opportunities to promote students' spiritual, moral, social and cultural development.					
45.	Willing to attend conferences, seminars and workshop for professional development.					
I.	**PERSONAL QUALITIES** Display personal characteristics which influence the quality of relationship in the classroom and staffroom such as:					
46.	Social rapport					
47.	Courtesy					
48.	Sensitivity					
49.	Reliability					
50.	Radiating confidence					
51.	Open-mindedness					
52.	Sense of humour					
53	Appearance					

APPENDIX R

TEACHING COMPETENCE GRADING SCHEME [TCGS]

BEGINNING TEACHER'S NAME:.....DATE.....

DIRECTION: Tick the column corresponding to the Teacher's grade in each dimension

TEACHING COMPETENCE SCALE:
5 = Very Good
4 = Good
3 = Average
2 = Poor
1 = Very Poor

TEACHING COMPETENCE DIMENSIONS		COMPETENCE LEVEL IN EACH DIMENSION					
		5	4	3	2	1	REMARKS
A.	Relationship with students						
B.	Planning						
C.	Subject Knowledge						
D.	Class Management						
E.	Communication						
F.	Evaluation						
G.	Reflection on Practice						
H.	Professionalisms						
I.	Personal Qualities						
J.	Observation						
% Competence level $\left(\frac{\text{Total Score}}{285} \times \frac{100}{1}\right)$							

GENERAL REMARKS.....

OBSERVER'S NAME:.....

SIGNATURE:.....DATE.....

APPENDIX S

TEACHING COMPETENCE GRADING SCHEME (TCGS)

	CATEGORIES	GOOD	SATISFACTORY	POOR
1.	RELATIONSHIP WITH STUDENTS	Shows good ability to secure attention from the class. Is responsive to individuals as well as to the class as a whole. Seeks to exercise control by encouragement and reception of ideas rather than by criticisms and coercion.	Shows reasonable ability to secure attention from the call as a whole and works satisfactorily with groups and individuals.	Lacks ability to secure attention from the class as a whole and withdrawal from informal contact with the children. Considerable difficulties in class control. Ignores children's progress.

	CATEGORIES	GOOD	SATISFACTORY	POOR
2.	PLANNING	Schemes and lessons carefully matched to children's abilities and interests. Flexible in approach and adapts plans to meet changing needs. Having a clear aim with respect to skills and concepts being developed and how theses fit into the logical structure of the subject. Shows initiative inventiveness and skill in employing a variety of method, including the use of teaching aids.	Schemes and lessons generally well-planned with attention given to objectives, content, method and material required. Does not always foresee differing possibilities and set suitable tasks and has occasional difficulty in modifying preparation to meet changing circumstances. Materials selected are clear and appropriate but safe rather than imaginative.	Inadequate. Plans set-piece schemes unrelated to the children's own experiences and capabilities. Lack of clarity, coherence and progression in schemes and lessons. Material selected is usually unsuitable. Work set is usually too easy or too difficult or inappropriate. Aids seldom used or not used effectively.

	CATEGORIES	GOOD	SATISFACTORY	POOR
3.	SUBJECT KNOWLEDGE	Outstanding competence in subject contributing to highly effective teaching.	Adequate competence in subject for effective teaching.	Inadequate competence in subject for effective teaching.
4.	CLASS MANAGEMENT and ORGANISATION	Changes class organisation smoothly to suit new activities. Employs varying teaching styles and strategies, and is willing to experiment. Paces activities effectively.	Lessons for the most part satisfactorily organised from beginning to end Effective management of individuals, small groups and class.	Lessons poorly organised with insufficient attention paid to beginnings and ends of lessons, organisations of groups, transitions from the activity to another and the availability and appropriateness of materials and equipment.

	CATEGORIES	GOOD	SATISFACTORY	POOR
5.	TEACHING STRATEGIES and COMMUNICATION	Employs a variety of verbal and non-verbal techniques which provoke enthusiastic and fruitful responses from the children.	Speech firm and clear. Vocabulary appropriate for children. Little variation in tone or voice or in the use of gestures. Questioning technique clear but often unimaginative. Tends to give away information rather than leading children to it with appropriate questions and suggestions.	Poor speech articulation, inappropriate vocabulary. Absence of modulation. Communication lacks expression. Children inattentive and lacking in interest, generally apathetic.

	CATEGORIES	GOOD	SATISFACTORY	POOR
6.	ASSESSMENT, RECORDING and REPORTING	Gives much though to children's behaviour and responses and carefully monitors their progress. Conscientious over marking and record keeping. Children take pride in their work realising much of their potential with a consistently high quality of performance.	Tries to keep abreast of marking and to keep appropriate records. Student's assessment of children's progress is sporadic and short term rather then with an extended perception.	Poor and irrelevant observation of children's behaviour. Work frequently carelessly marked or not marked. Students seems unaware of children's lack of involvement or progress.

	CATEGORIES	GOOD	SATISFACTORY	POOR
7.	REFLECTING ON PRACTICE	Thorough preparation reflected in a well-presented and carefully arranged record. Schemes adapted to meet children's responses and needs. Lesson appraisals show considerable awareness and insight. Clear evidence of willingness and ability to respond to advice. Very perceptive in evaluating own teaching.	Acceptable presented records providing a documented record of work done. Some thought given to method as well as content and additional material added where appropriate. Lesson appraisals restricted in their perception but conscientious. Some evidence of responses to advice. Reflects on own teaching and makes adjustments.	Poorly presented with inadequate thought given to content, method or material. Few or superficial lesson appraisals. Evidence of failure to act on advice. Little self-evaluation.

	CATEGORIES	GOOD	SATISFACTORY	POOR
8.	PROFESSIONALISM	Good working relationships with staff; volunteers to contribute outside the classroom (meetings, etc). Contributes well to pastoral and extra-curricular activities.	Adequate working relationships and extra-curricular involvement. Contributes when asked – less willing to take the initiative.	Poor working relationships. Reluctance to take up opportunities for extra-curricular involvement.
9.	PERSONAL QUALITIES	This category covers all those personal characteristics which influence the quality of relationship in the classroom and staff room, and includes social rapport, courtesy, Sensitivity, Reliability, enthusiasm, Confidence, Open-mindedness, Sense of humour and Appearance.		

	CATEGORIES	GOOD	SATISFACTORY	POOR
10.	OBSERVATION	This category includes collaborative agreement (pre-conference) on purpose of observation, well written record of observation that is acceptable enough to the observer and observed which in turn provides basis for discussing the lesson, engaging in inquiry or problem solving during the pre and post observation conference, creating an atmosphere of mutual respect and trust and ensuring that help is confidential.		
		Willingness to observe other teacher's classroom. Eager to be observed. Sees the need for collegial support and coaching, Develop well balanced programme of teaching activities. Attend scheduled support meetings.	Some evidence of willingness to observe and be observed. See little need for support and coaching by colleagues only fairly enthusiastic in attending support meetings for feedback of observations and demonstrations.	Seem used to "closed door" norm of classroom teaching. Do not see the need for support meetings and not eager to attend. Shy away from being observed or observing colleagues.

APPENDIX T[1]

TEACHING COMPETENCE DISCUSSION FOCUS INSTRUMENT [TCDFI]

(Focus for the discussion of teaching competence during mentoring session)

Lesson taught ( ) Beginning Teacher's Name:.....

Lesson observed ( ) Mentor:.....Date.....

(Tick the appropriate)

	CATEGORIES	COMMENTS
1.	Relationships With Students	
2.	Planning	
3.	Subject knowledge	
4.	Assessment, recording and reporting.	
5.	Classroom organisation and management	
6.	Teaching strategies and communication	
7.	Reflecting on practice	
8.	Professionalism	
9.	Personal qualities	

APPENDIX T^2

ASPECTS OF TEACHING COMPETENCE IN FOCUS

(1) Relationship with pupils		(4) Assessment, Recording and Reporting		(7) Reflecting on Practice
(2) Planning		(5) Class Organisation and Management		(8) Professionalism
(3) Subject knowledge		(6) Teaching Strategies and Communication		(9) Personal Qualities

Lesson Rapport Beginning Teacher:	Subject:	Date:
Signed:		Date:

Beginning Teacher Response:

cc. Beginning Teacher, Mentor, researcher and assistants.

APPENDIX U[1]

TABLE SHOWING PERFORMANCES OF THE FIRS BEGINNING TEACHERS IN THE EXPERIMENTAL GROUP AFTER EXPOSURE TO TMPNE [N=16]

Teacher No.	Pre-test	Post-Test	Pre-Post	d	d^2
1	80	166	166-80	86	7396
2	76	141	141-75	65	4225
3	83	154	154-83	71	5041
4	74	168	168-74	94	8836
5	70	145	145-70	75	5625
6	65	173	173-65	108	11664
7	72	159	159-72	87	7569
8	68	134	134-68	66	4356
9	71	97	97-71	26	676
10	70	152	152-70	82	6724
11	66	163	163-66	97	9409
12	72	138	138-72	66	9409
13	80	93	93-80	13	4356
14	82	134	134-82	52	2704
15	75	147	147-75	72	5184
16	78	138	138-78	60	3600
TOTAL	**1182**	**2302**	**1120**	**1120**	**87534**

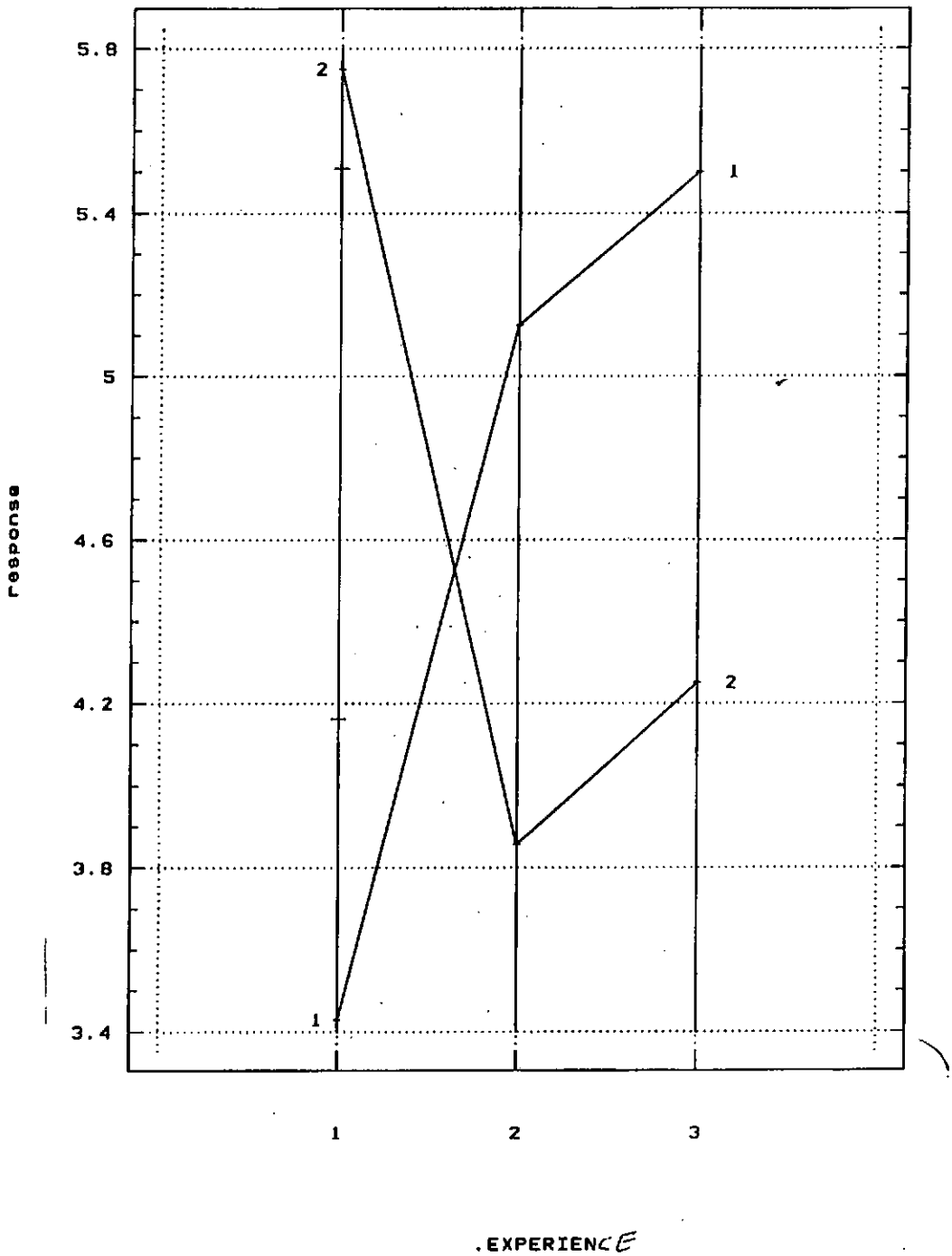
APPENDIX U^2

TABLE SHOWING PERFORMANCES OF THE BEGINNING TEACHERS IN THE CONTROL GROUP IN PRE-TEST AND PST-TEST [N=16]

Teacher No.	Pre-Test	Post-Test	Pre-Post	d	d^2
1.	82	89	89-82	7	49
2	78	80	80-78	2	4
3	80	83	83-30	3	9
4	75	71	71-75	4	16
5	79	82	82-79	3	9
6	62	67	67-62	5	25
7	65	69	68-65	3	9
8	70	81	81-70	11	121
9	78	80	80-78	2	4
10	68	74	74-68	6	36
11	72	70	70-72	-2	4
12	71	68	68-71	-3	9
13	70	76	76-70	6	36
14	74	82	82-74	8	64
15	04	75	75-64	11	121
16	73	78	78-73	5	252
Total	**1161**	**1224**	**63**	**63**	**541**

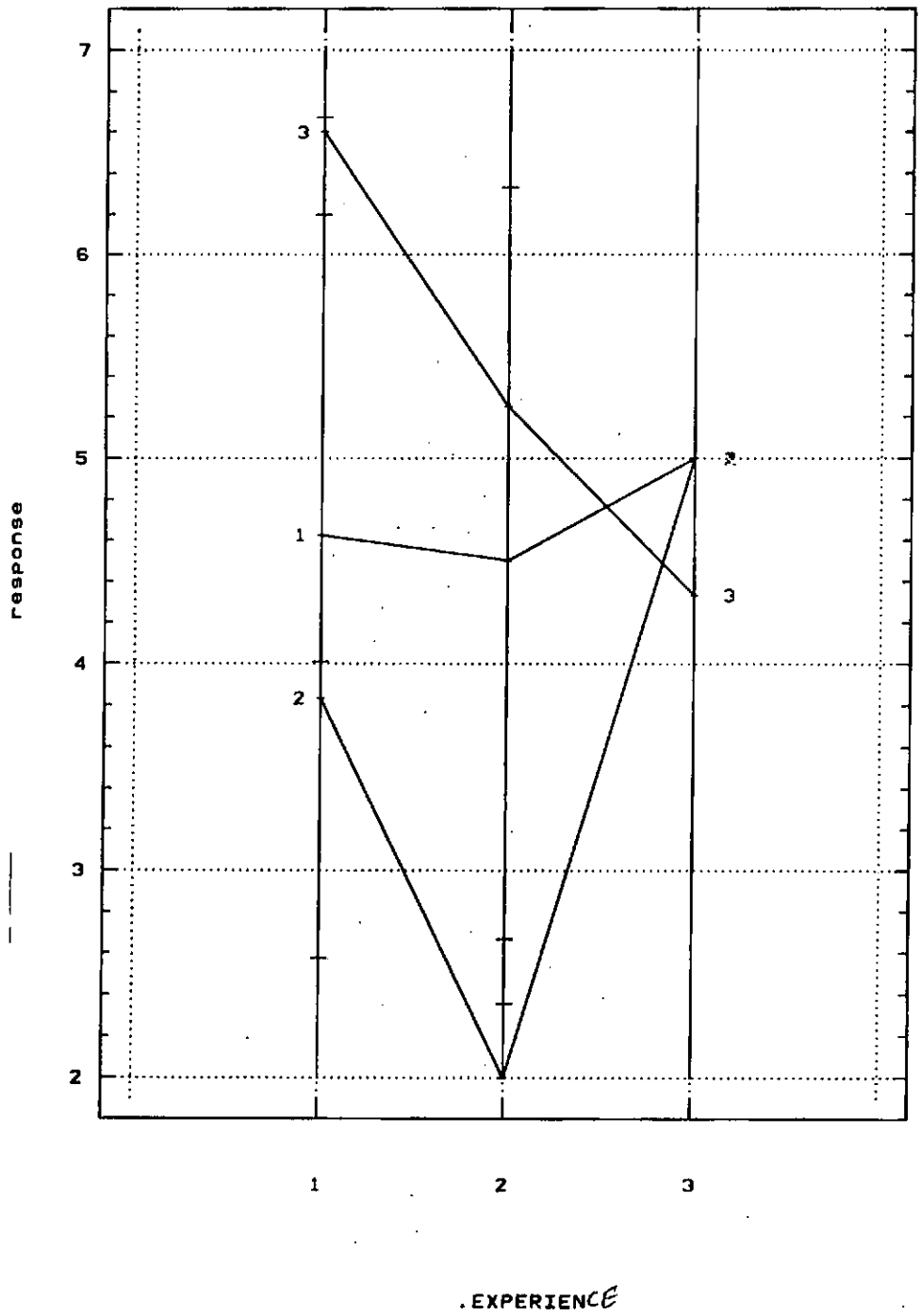
APPENDIX X'

Plot of Interactions for ..GENDER by .EXPERIENCE



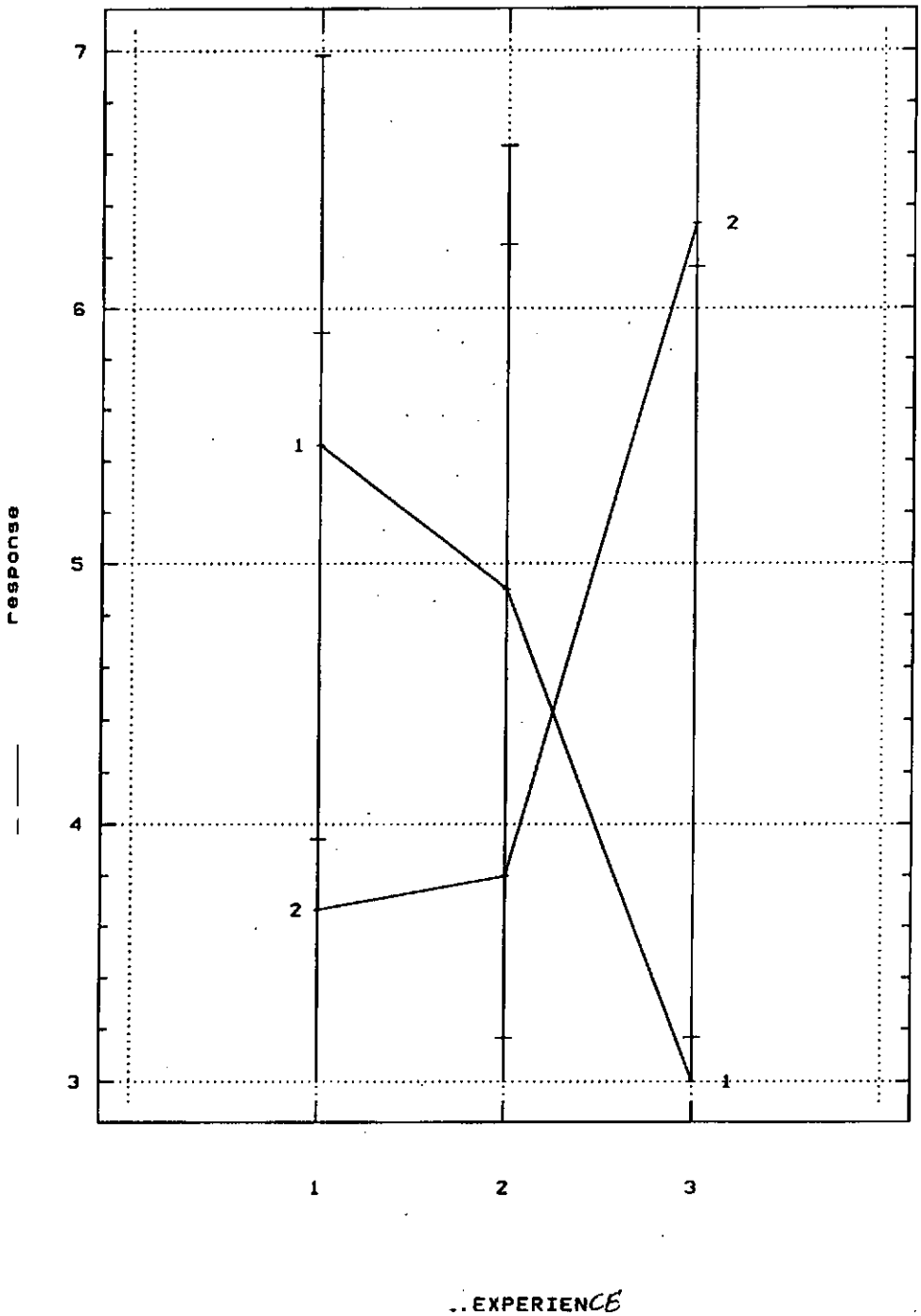
APPENDIX X^2

Plot of Interactions for .QUALIF by .EXPERIENCE



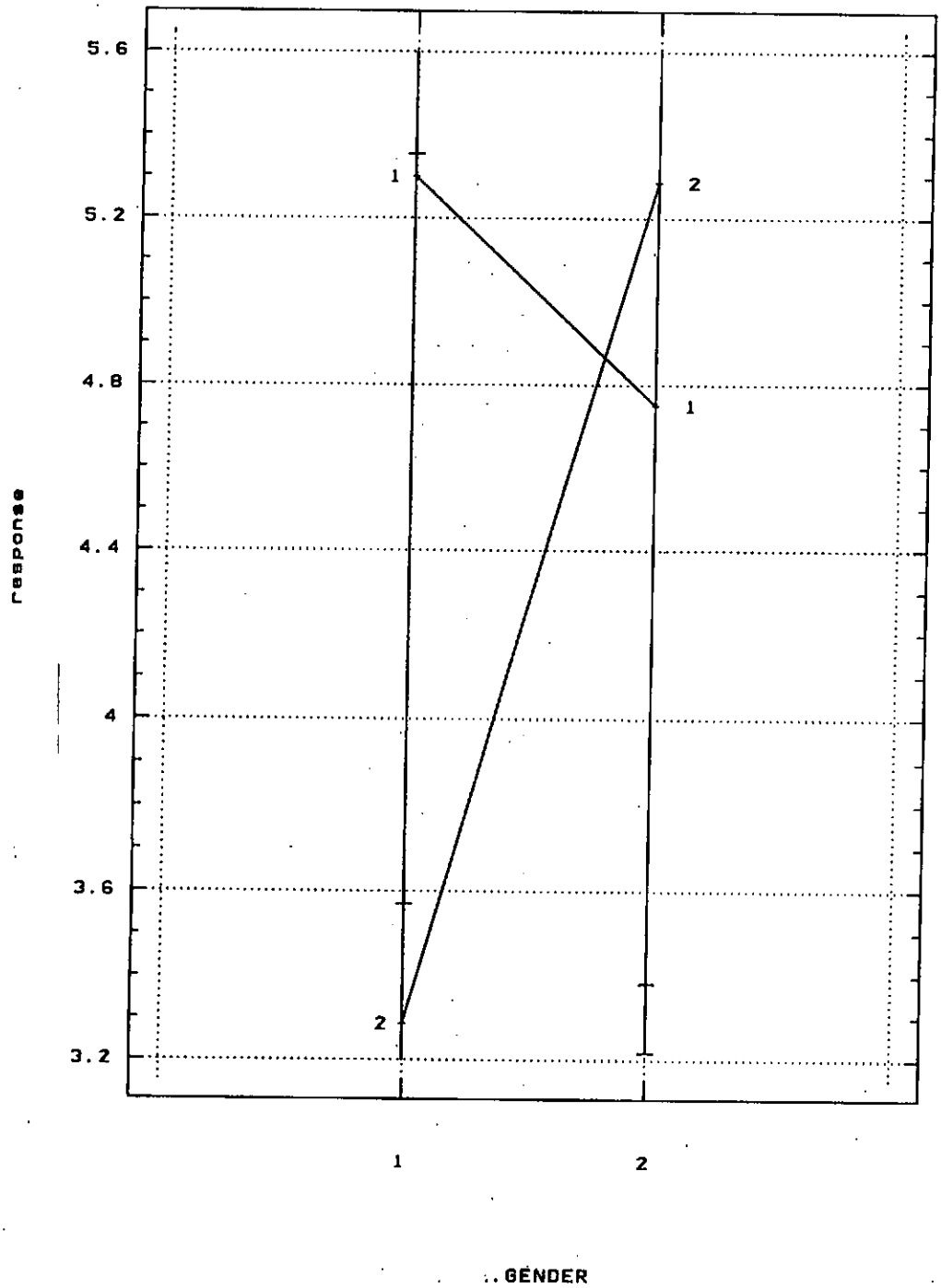
APPENDIX X^3

Plot of Interactions for . .TRAINING by ..EXPERIENCE



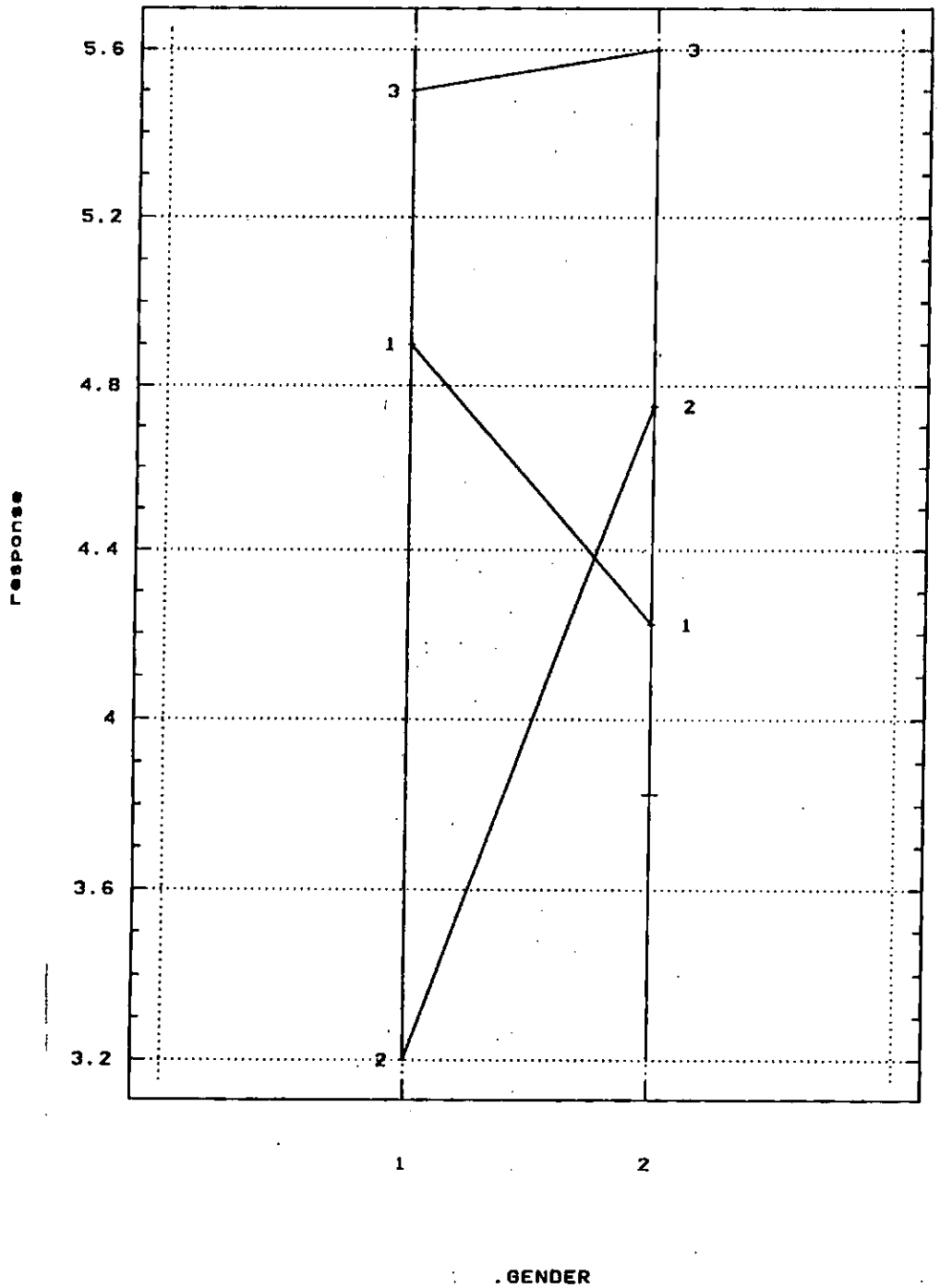
APPENDIX X^4

Plot of Interactions for ..TRAINING by ..GENDER



APPENDIX X^5

Plot of Interactions for ..QUALIF by ..GENDER



APPENDIX X^6

Plot of Interactions for ..TRAINING by ..QUALIF