TEACHING BEHAVIOUR PATTERNS IN HIGH AND LOW PERFORMING BIOLOGY CLASSES IN SELECTED NAIROBI PROVINCE SECONDARY SCHOOLS

BY

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Thesis submitted in partial fulfilment of the requirements for the degree of master of education of Kenyatta University.
DECLARATION

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

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This thesis has been submitted with our approval as University Supervisors.

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DEDICATION

To my wife Esther and sons Kelvin and Hillary

I would like to acknowledge my profound regards to the society of the University of Benin and Dr. Matthew for their professional guidance and support in every aspect of my work.

I am also grateful to Benin City University for granting me a scholarship which enabled me to pursue this course.

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TABLE OF CONTENTS

Declaration ii
Dedication iii
Acknowledgements iv
Table of contents vi
List of tables xi
List of figures xiii
Abstract xiv

CHAPTER ONE: INTRODUCTION

1.1 Background to the study 1
1.2 The conceptual framework 5
1.3 Statement of the problem 6
1.4 Objectives 8
1.5 Research questions 8
1.6 Significance of the study 9
1.7 Assumptions 9
1.8 Scope and limitations of the study 10
1.9 Definition of terms 10
CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction 13

2.2 The concept of classroom interaction 13

2.2.1 Determinants of teacher-student classroom interaction patterns 16

2.3 The teaching behaviour 18

2.3.1 Teaching styles 20

2.3.2 Use of questions in teaching 23

2.4 Nature of teacher-student interaction in biology classrooms 24

2.5 Teacher influence on performance 26

2.6 Classroom interaction analysis 29

2.6.1 Approaches for studying classroom processes 30

2.6.2 Reliability and validity of observation systems 35

2.7 Research in classroom verbal interaction in Kenya 36

2.8 Chapter summary 40

CHAPTER THREE: METHODOLOGY

3.1 Introduction 42

3.2 The population of study 42

3.3 Sample and research design 43

3.4 Instrument for data collection 46
CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction 53

4.2 Presentation and analysis of data 53

4.3 A description of characteristics and patterns of teacher-pupil interaction in secondary school biology classes 56

4.3.1 Teacher talk 57

4.3.2 Pupil talk 58

4.3.3 Teacher questions 64

4.3.4 Pupil questions 67

4.3.5 Teacher statements and directions 68

4.3.6 Pupil statements 69

4.3.7 Use of teaching methods and styles 70
4.4 Characteristics and patterns of teacher-pupil interaction in high performing schools

4.4.1 Teacher talk in high performing schools

4.4.2 Pupil talk in high performing schools

4.4.3 Teacher statements in high performing schools

4.4.4 Teacher questions in high performing schools

4.4.5 Pupil statements in high performing schools

4.4.6 Pupil interaction patterns in high performing schools

4.4.7 Use of teaching methods and styles in high performing schools

4.5 Characteristics and patterns of teacher-pupil interaction in low performing schools

4.5.1 Teacher talk in low performing schools

4.5.2 Pupil talk in low performing schools

4.5.3 Teacher statements in low performing schools

4.5.4 Teacher questions in low performing schools

4.5.5 Pupil statements in low performing schools

4.5.6 Pupil questions in low performing schools

4.5.7 Use of teaching methods and styles in low performing schools

4.6 A descriptive comparison of teacher-pupil interaction patterns in high and low performing schools

4.6.1 Teacher talk in the high and low performing schools

4.6.2 Pupil talk in the high and low performing schools
4.6.3 Teacher statements and questions in biology classes in both high and low performing schools 104

4.6.4 Pupil statements and questions in high and low performing schools 105

4.6.5 Teaching methods and styles in high and low performing schools 107

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction 109

5.2 Summary of findings 110

5.3 Conclusion 114

5.4 Recommendations 116

5.5 Proposals for further research 117

Bibliography 119

Appendices 132


B A Science Teaching Observation Schedule (STOS) 133

C Research schedule 135

D Estimated research budget 136

E Letter of introduction to the heads of schools 137

F Permit from the Office of the President 138
LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table II.1</td>
<td>A typology of teaching styles</td>
<td>22</td>
</tr>
<tr>
<td>Table III.1</td>
<td>The sampling grid</td>
<td>45</td>
</tr>
<tr>
<td>Table III.2</td>
<td>The sampling grid for pilot study</td>
<td>50</td>
</tr>
<tr>
<td>Table IV.1</td>
<td>A relative frequency distribution of the total scores per category for four observations per teacher</td>
<td>55</td>
</tr>
<tr>
<td>Table IV.2</td>
<td>Total teacher talk versus pupil talk</td>
<td>57</td>
</tr>
<tr>
<td>Table IV.3</td>
<td>Descriptive statistics of the total proportional frequency scores in the STOS categories by all the subjects</td>
<td>63</td>
</tr>
<tr>
<td>Table IV.4</td>
<td>Use of teaching methods and styles</td>
<td>71</td>
</tr>
<tr>
<td>Table IV.5</td>
<td>A relative frequency distribution of the total scores per category for four observations per teacher in high performing schools</td>
<td>74</td>
</tr>
<tr>
<td>Table IV.6</td>
<td>Total teacher talk versus pupil talk in high performing schools</td>
<td>75</td>
</tr>
<tr>
<td>Table IV.7</td>
<td>Descriptive statistics of the total proportional frequency scores in all STOS categories for the teachers in high performing schools</td>
<td>78</td>
</tr>
<tr>
<td>Table IV.8</td>
<td>Use of teaching methods and styles in high performing schools</td>
<td>83</td>
</tr>
<tr>
<td>Table IV.9</td>
<td>A relative frequency distribution of the scores for four observations per teacher in the low performing schools</td>
<td>86</td>
</tr>
</tbody>
</table>
Table IV.10  Total teacher talk versus pupil talk in low performing schools 87

Table IV.11  Descriptive statistics of the total proportional frequency scores of all STOS categories for the teachers observed in low performing schools 92

Table IV.12  Use of teaching methods and styles in low performing schools 96

Table IV.13  Proportion of teacher talk versus pupil talk in high and low performing schools 99

Table IV.14  Comparative descriptive statistics of the total proportional frequency scores for all STOS categories in high and low performing schools 103
LIST OF FIGURES

Figure I.1 A model to show how teacher-pupil interaction influences pupils’ performance 6

Figure III.1 Main features of the classification used in Science Teaching Observation Schedule (STOS) 47

Figure IV.1 A pie chart showing teacher talk versus pupil talk 61

Figure IV.2 A pie chart showing teacher-pupil talk in high performing schools 77

Figure IV.3 A visual representation of the verbal interaction behaviour in low performing schools 91

Figure IV.4 A comparison of teacher versus pupil talk between the high and low performing schools 102
This study addresses the issue of verbal teaching behaviour in some secondary school Biology classes in Kenya at a time when concern is being expressed about the poor performance in Biology. Specifically the researcher aimed at answering the following research questions:

a) What are the common teacher-student interaction patterns in secondary school biology classes?

b) What type of teacher-pupil classroom interaction patterns exist in high performing schools?

c) What type of teacher-pupil classroom interaction patterns exist in low performing schools?

d) Is there any difference in teacher-pupil classroom interaction patterns between the high and low performing schools?

This was a simple descriptive survey research and the sample was randomly selected. Data collected from 10 (ten) secondary school teachers teaching form three biology classes in Nairobi province of Kenya. A modified Science Teaching Observation Schedule (STOS) developed by Eggleston (1975) was adapted for data collection. Marginal notes were also made of the main teaching methods and styles at the end of a lesson and other aspects not codable using STOS but thought to have some pedagogical implications. Data was analysed using descriptive statistics.
The analysis revealed that teacher talk dominated the classrooms with pupil talk taking less than a quarter of the total verbal interactions. There was an over emphasis on content and mainly classroom interaction was teacher dependant. The statements and questions posed mainly demanded recall or application of facts and principles testing pupils knowledge hence, hindering their high level thinking process. Teachers rarely used pupils' ideas and mainly asked questions to test what they wanted pupils to learn. Poor classroom management was also manifested by the prevalent noise making and chorus answers especially in the low performing schools.

Teachers in most biology classes observed practised more of the teacher-centred than learner-centred teaching methods. However, there was a tendency for teachers in the high performing schools to use slightly more learner-centred teaching methods than their counter parts in the low performing schools. Teacher talk domination imply an autocratic teaching behaviour that might hinder the learning process and hence the need to improve on the type of teacher-pupil interaction to enhance learning.

The prevalence of teacher-centred teaching methods reduces pupil participatory experiences and is seen as not favourable to science teaching. The short and rhetorical teacher questions reflected lack of teacher preparedness and mastery of
questioning methods which may deter learner creativity. This lack of inquiry approach to teaching of biology even in the high performing schools might be the reason for failure to score the maximum possible points in the national examinations.

This study recommends that:

a) Teachers be inserviced to encourage and assist them increase pupil learning activities.

b) Learner-centred teaching methods and classroom management be emphasized in teacher education curriculum.

c) Teacher-colleagues need to observe one another in class for more self-evaluation on teaching approaches and content coverage.
CHAPTER ONE
INTRODUCTION

1.1 Background to the study

Teaching can be viewed as a moral enterprise with the teachers’ intention being to develop students’ ability. This calls for a need to focus on the improvement of teaching by identifying the characteristics of good teachers or good teaching methods. Teachers employ different styles of instruction to impart knowledge to their pupils or to encourage them to acquire knowledge for themselves. In teaching, classroom atmosphere is an important aspect in moulding the learning habits of pupils.

In any classroom, there are two types of environments which influence learning. There is the ‘physical environment’ consisting of physical materials like books, equipment, desks, science materials etc. The other is the social environment being made of the verbal and non-verbal interactions which take place in a particular subject. These two environments partly contribute towards the totality of the existing classroom learning climate. Eventually, they determine the achievement of the set educational goals.

Classroom learning climate is largely determined by the variety of classroom activities. Classrooms are generally busy places, buzzing with activity. Children work alone or with one another and teachers help individual pupils or talk to pupil groups. This means that it is the way these activities are manipulated that determines the degree to which they influence learning.

The question of what characterises good teaching still remains unanswered. Research has shown a number of factors that influence learning. According to
Muthwii (1981), the quality and type of classroom interaction pattern is important in influencing some measures of learning sciences. Ralph Taylor (1949) also identifies some fundamental questions which must be answered in developing any curriculum and its plan of instruction as; First, the question of what educational experiences to be provided that are likely to help attain educational ends and second, how these educational experiences can be effectively organised.

To attain the expected ends, curriculum implementers such as teachers need to address these questions seriously. They need to appreciate the importance of the instructional procedure and the learning environment to which a learner has to be exposed, to enable the attainment of these ends. Classroom interaction has many parameters that include resource material, non-verbal behaviour, verbal behaviour, etc. This means that teachers can adopt various patterns of interaction in their teaching endeavour. However, it is of paramount importance that the teacher-pupil interaction patterns adopted lead to achievement of the desired goals.

Since the launching of the “sputnik” by the Russians in 1957, teaching approach especially in science has changed from the didactic kind of study to the one that articulates the needs and the aspirations of the society. In the United States of America (U.S.A) for example, there was a shift to the new science curriculum. The new approach placed greater emphasis on teaching science for developing scientific inquiry (process) rather than stressing the retention of scientific information (Product). The modern approach radically transformed the teaching of biology and was demonstrated to be more effective. Learners were encouraged to participate more in the learning process with the teacher acting as a guide (Baez 1976).
In Kenya, School Science Project (SSP) introduced in 1968 was a response to reforms that were taking place elsewhere in Britain and United States of America. Lack of coherent implementation of this curriculum however led to its abandonment (Embeywa, 1991). This was not the end though, as evidenced by later development in the curriculum.

A more recent trend since 1985, has been the introduction of the 8.4.4. system of education and its emphasis on science education. The objectives of the 8.4.4. system of education biology course at secondary level, clearly show a shift from traditional to scientific approach in teaching (K.N.E.C. regulations and syllabus 1998 - 99). While the former approach leaves the teacher to take much of the class time, the latter advocates for more students’ participation in the teaching-learning process. A variety of participatory experiences aimed at inquiry training in pupils are also spelt out in the syllabus.

The government of Kenya, parents, and other stakeholders have all along given the aspect of quality education a lot of emphasis (Gachathi Report 1976). To this end, the government supports the training of teachers and even goes further to employ the qualified teachers apart from equipping the public schools with good teaching facilities. All this is done to ensure successful teaching in schools.

To determine whether the students have learned during the teaching, several measures can be used. One of the most important measures is the students’ performance in an examination. The Kenyan education system has two national examinations, one at the end of eight years of primary education (K.C.P.E), and the other done after four years of secondary education (K.C.S.E). These examinations have various purposes one of which is to serve as a measure of achievement.
Since its inception, the 8.4.4. system of education has received a lot of criticisms. This system has been characterised by myriads of problems ranging from subject load to poor performance in examination. Every leader including politicians and scholars are getting worried about this poor performance by schools. The average mark for all examinable subjects has been on a steady decline. For example in 1996, of all the students who sat the Kenya Certificate of Secondary Education (K.C.S.E.) examination, 32,470, about 21% scored below a D+ (Daily Nation, July 26, 1998; P12). This decline is even more marked in the crucial subjects like science. For instance, reports indicate a general trend of poor and fluctuating performance in K.C.S.E in biology (Appendix A). The reports note that students lack grasp of basic biological concepts. The question is what brings about this kind of performance.

Twoli (1986), Maundu (1987) and Orodho (1996) in their studies observe that there are various factors that influence students’ achievement in science. These include classification, type and boarding status of schools, school resources, student and teachers characteristics and school learning related practices. This shows that the array of variables that singly or together might determine the achievement of some or all pupils are formidable.

It has also been argued that poor teaching including most instances of grossly inappropriate behaviour that might seem to stem from malice or callousness are not done deliberately or even consciously by teachers (Cohen 1994). He adds that some may result from lack of adequate mechanisms of providing feedback to the teacher. It is possible that some teachers may not be aware of their teaching behaviour. Poor teaching may lead to low achievement, hence the need to constantly provide feedback on the teaching behaviour to teachers. The question arising is whether this has been done in Kenyan schools. The literature reviewed indicates that little has been done especially in the teaching of science subjects.
This together with the other questions raised by the researcher necessitates a study in this area.

1.2 The conceptual framework

Classrooms are busy places that involve a lot of interaction between the teacher and the pupils. Human interaction as postulated by Blumer (1966) is of two types, symbolic and non-symbolic. Non-symbolic is roughly equivalent to the biological notion of a reflex action. However, it is noted that the vast proportion of human interaction though, is symbolic and involves interpretation. That is when two people are interacting, each is constantly interpreting and reacting, and re-interpreting and re-reacting. The theory assumes that there can be joint actions or social acts in which a number of individuals act together, sharing their construction of what is going on.

Delamont (1976) notes that there is an element of power when we think of social events in this way. In a social situation some participants may have more power than others and so they may be able to enforce their definition of the situation upon others. He further argues that the more powerful will therefore control the events.

In a classroom, symbolic interactionist approach brings out the relationship of the teacher and his or her pupils as a joint act, a relationship that works, and is about doing work. The interaction is understood as the daily give-and-take between teachers and pupils. The process is one of negotiation, an on-going process by which everyday realities of the classroom are constantly defined and re-defined. The teacher is more powerful in the classroom (Bennet 1979).
This means that the totality of students' behaviour including performance may partly depend on the teaching behaviour. Hence, the importance of the teaching behaviour pattern.

The following adoption of Amidon and Hough (1967) model can show how teacher behaviour influences pupil behaviour.

![Diagram showing teacher-pupil interaction and its influence on pupil performance.](image)

Fig 1.1 A model to show how teacher-pupil interaction influences pupils’ performance

The above model shows that the type and quality of classroom interaction pattern influence pupils’ motivation, communication and conceptualisation of the ideas being taught. Consequently this may affects the performance of students. The present study was based on the above model.

1.3 Statement of the problem

The quality of teaching and students’ achievement in public examinations have received a lot of attention in Kenya. Consequently, teachers and students have frequently been given advice on these two issues. Nonetheless, not much change has been seen in terms of performance in National examinations especially in science subjects. It has been observed, that there is a general trend of poor
performance in biology. It is also clear that some public schools have continued to perform relatively better than others.

While there are other factors that contribute in influencing K.C.S.E biology performance, teaching behaviour is of paramount importance (Muthwii 1987). Teachers are indeed more powerful than students in the sense of having greater responsibility in arranging classroom activities. It is also important to realise that most teaching methods will always go with verbal behaviour patterns. Galloway (1966) observes that much of classroom interaction involves verbal exchanges. This shows the importance of verbal behaviour in any classroom.

A review of literature on the teaching behaviour shows that classroom observation research can provide empirical data from which teacher-pupil interaction patterns can be deduced. However, very little research has been done on verbal interaction behaviour between teachers and students in high school biology classes in Kenya. This poor state of classroom observation research is also found in other subject areas.

The purpose of this study was to find out the interactive behaviour patterns of teachers and pupils in biology classrooms in high and low performing schools in Nairobi province of Kenya. There may be potent determinants of achievement that might be located in pupils, teachers and the transactions taking place. The study was exclusively concerned with intellectual transactions that take place in biology lessons. There is a need to address the question of teaching-learning behaviour patterns in Kenya particularly in biology classes since little has been done in this area.
1.4 Objectives

The objectives of this study were the guiding frame for answering the research questions. These objectives are as follows:

1.4.1 To find out the classroom interaction patterns in secondary biology classes.

1.4.2 To find out the form of teacher-pupil classroom interaction patterns in both high and low performing biology classes in secondary school.

1.4.3 To compare teacher-pupil classroom interaction patterns between high and low performing biology classes in secondary school.

1.5 Research questions

This research aimed at answering the following questions.

1.5.1 What are the common teacher-student interaction patterns in secondary biology classes?

1.5.2 What type of teacher-pupil classroom interaction patterns exist in high performing schools?

1.5.3 What type of teacher-pupil classroom interaction patterns exist in low performing schools?

1.5.4 Is there any difference in teacher-pupil classroom interaction patterns between the high and low performing schools?
1.6 Significance of the study

First, this study will help to give feedback to teachers on their classroom teaching behaviour. Nature of classroom interaction helps to find causes of low motivation, poor participation and poor performance by pupils (Maimbolwa 1995). Teachers will therefore be able to respond to this appropriately leading to effective teaching. This in turn will help the students to improve in performance.

Second, because of the much effort being made in Kenya to train teachers, there is need for a follow up of the practice in the classroom. It is important to visit these teachers to find out how they are coping with actual classroom situation. Empirical data on the effectiveness of training exercise is necessary hence the need for this study. The research findings will help the teacher training institutions to recommend more effective strategies. This will enhance competence among the teacher-trainees.

Last but not least, the findings of this research will help the policy makers to assess the extent of application of new approaches to teaching science.

1.7 Assumptions

1.7.1 Teaching learning behaviour observed is the usual behaviour in each class.

1.7.2 The observer’s presence did not drastically influence the desirable behaviour of those being observed.

1.7.3 The observation tool chosen to record the interaction patterns gave an adequate representative sample of the total classroom behaviour
1.8 Scope and limitations of the study

1.8.1 This study was restricted to secondary school biology classes and focuses on the verbal interaction patterns only. This is despite the fact that biological sciences as a subject is taught in secondary schools. However, biology being a science can be a representation of the other science (Nagel 1974).

1.8.2 This study was done in biology classrooms within Nairobi province only. Therefore the results cannot be generalized. However, the results will be adequate for descriptive purposes and for suggestive analysis (Rosenshine and First, 1973).

1.8.3 This study was concerned with verbal interaction patterns and was restricted to biology classrooms.

1.8.4 The presence of the observer might have effect on the teachers and pupils. The researcher did everything possible to try and eliminate this effect. Three visits rather than just one or two should help reduce the observer effect (Borge et al. 1971).

1.9 Definition of terms

1.9.1 Sputnik - The first artificial satellite to be launched into space by Russians in 1957. It triggered off the space race culminating in man landing on the moon in 1969. It produced a lot of windfalls for science education.

1.9.2 8.4.4. - A system of education introduced in 1985 that is