ATTITUDES OF PHYSICS TEACHERS TOWARDS THE TEACHING/ LEARNING PROCESS IN SECONDARY SCHOOLS IN NGUNI DIVISION, MWINGI EAST DISTRICT, KENYA

BY

JACOB MWENDWA MBITI

BED/30080/82/DF

A RESEARCH REPORT SUBMITTED TO THE INSTITUTE OF OPEN AND DISTANCE LEARNING IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF THE AWARD OF BACHELORS DEGREE IN EDUCATION (SCIENCE) OF KAMPALA INTERNATIONAL UNIVERSITY

NOVEMBER 2011

DECLARATION

I Jacob Mwendwa Mbiti declare that the material in this book has been done entirely by my effort and has not been presented elsewhere for any academic award.

Signature---------- Date----18/08/2010.

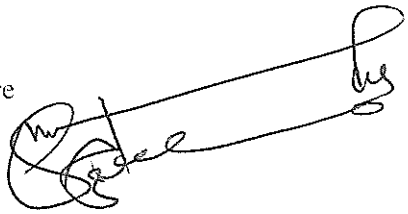
Candidates' name:

JACOB MWENDWA MBITI

BED/30080/82/DF

APPROVAL

This research report is submitted for examination with my approval as the candidates' University Supervisor.

Signature  Date 18/11/2010

Name: MR. MUNDU MUSTAFA

DEDICATION

This work is affectionately dedicated to my beloved wife Annahi and my mother Martha for their support patience and understanding during this period of study.

ACKNOWLEDGMENT

I also owe a lot of appreciation to all those who assisted me in carrying out this research.

I am grateful to my supervisor Mr. Mundu Mustafa, Who tirelessly went through my work and inspired me to dig deeper into the core of the matter. His kind criticism, patience and understanding, assisted me a great deal.

I am indebted to my friends who gave me encouragement in time of difficulties. Thanks also go to all those lecturers who impacted professionalism into my work.

Special thanks go to my dad Mr. Charles and my daughter Veronica.

I wish to thank my family for their love, financial support and inspiration during my stay in Kampala International University (K.I.U).

Finally, I would like to thank all my respondents and those within a short notice without which this work would not have been possible.

TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

The purpose of this study was to investigate the attitudes of physics teachers towards the teaching- learning process in selected Secondary schools of in Nguni Division, Mwingi East Kenya.

The objectives of the study were; to determine the role of teachers' attitudes on the teaching- learning process, to whether teaching attitudes affecting negatively the teaching- learning process, and to investigate whether the teaching competencies affect the teaching- learning process.

The methods used for data collection were questionnaires to the teachers and interview guide to the headmasters of the schools which participated in the study.

Findings indicated that teacher experience, qualification of the teacher and the motivation of the teacher have a direct relationship with the performance of students in physics.

Recommendations included Government making facilities at school for physics teachers to teach in a conducive environment in order to aid the better performance of physics students in their schools and that government should make sure that it facilitates unqualified teachers to go for further studies to improve the academic achievement of students in physics.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

While it is true that there are teachers whose attitudes are positive towards the promotion of good science teaching- learning situations, for most students, in many countries, the reality of the school classroom consists of lessons where science is transmitted by their teachers, at best, as a set of facts, laws and data.

The results brought about by physics education researchers' pedagogical experiments have good consequences only when rooted within the school as an institution (teacher, curriculum and defined pedagogical practices) and within a particular context (culture, program, country). So, we conclude that there are no universal methods to modify this situation. That is, there are a variety of science teaching styles as a result of the strong interaction existing between teaching attitudes and competencies, school and society.

In what follows the researcher will first give a description and make some comments about current science teaching attitudes and competencies, trying to clarify some issues and bring forward some ideas being tested in different parts of the world. Next, he discusses ways that could lead to changes towards adequate teaching attitudes through both the training of future teachers and the in-service teacher education programs.

The present discussion is mostly limited to secondary school physics (science) teachers (15-18 years old pupils), but it applies to primary teachers, without loss of perspective. At the university level research in science education has been less extensive. Teachers have seldom been the object of studies in spite of wide recognition that there is room for improvement, as evidenced by the new proposals to improve teaching at the university

introductory level (i.e. Powerful ideas in biological science: a model course, AAPT, 1995). Fensham (1992) mentions that secondary school teachers are more aware of their difficulties, seeking answers to cope with their and their students' problems, while university and college teachers have a naive standing in relation to what goes wrong in the classroom. Bliss (1993) says that children find science learning difficult, and we may add that teachers also find science teaching difficult.

1.2 Statement of the Problem

The study will investigate the attitudes of physics teachers towards the teaching- learning process in selected Secondary schools. From the researcher's personal teaching experience, teacher attitudes is a major influence in the academic performance in sciences especially physics and yet it's not given much attention. This lack of attention to the most important drive to high academic performance has driven the researcher to carry out the study.

1.3 Purpose of the Study

Purpose of the Study was to investigate the attitudes of physics teachers towards the teaching- learning process in selected Secondary schools in Nguni Division, Mwingi East, Kenya.

1.4.0 Objectives of the Study

The study specifically sought to:

(i) determine the role of teachers' attitudes on the teaching- learning process.

(ii) determine the whether teaching attitudes affecting negatively the teaching-learning process.

(iii) determine whether the teaching competencies affect the teaching- learning process.

1.4.1 Research Questions

(i) What is the role of teachers' attitudes on the teaching- learning process?

(ii) How do the teaching attitudes affect negatively the teaching- learning process?

(iii)How do the teaching competencies affect the teaching- learning process?

1.5 Scope of the Study

The study investigated the attitudes of physics teachers towards the teaching- learning process. It was carried out in selected Secondary schools in Nguni Division, Mwingi East Kenya.

The study was limited to the specific objectives of the study outlined above. It took place between November 2009 to April 2010.

1.6 Significance of the Study

This study will benefit the following disciplines:

Provide information that can be used by Ministry of Education policy makers to identify attitudes that can be associated more with high performance in physics among students.

Increase awareness of the Head teachers. Board of Governors and PTA and Teachers on attitudes associated with high performance in physics.

In brief the physics teacher performance will be reviewed, priority areas for improvement will be identified and improvement plan containing objectives may be developed for each priority area.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 Overview

This chapter reviews literature as an account of the knowledge and ideas that have been established by accredited scholars and experts in the field of study. It is guided by the objectives of the study outlined in chapter one.

2.1 The Role of Teachers' Attitudes

The word attitude (from Latin aptus) is defined within the framework of social psychology as a subjective or mental preparation for action. It defines outward and visible postures and human beliefs. Attitudes determine what each individual will see, hear , think and do. They are rooted in experience and *do not become automatic routine conduct.*

Attitude means the individual's prevailing tendency to respond favorably or unfavorably to an *object* (person or group of people, institutions or events). Attitudes can be positive (values) or negative (prejudice). Social psychologists distinguish and study three components of the responses: (a) *cognitive component,* which is the knowledge about an attitude object, whether accurate or not;(b) *affective component:* feelings towards the object and (c) *conative or behavioral component,* which is the action taken towards the object.

We understand that in most situations the three components appear concomitantly to shape teachers' classroom postures, through a direct and indirect interaction between society, school and teachers, following the model presented above. Leite (1994) raises questions about how does society see the need for change, what are its demands, what is considered modern, and how do these beliefs influence teachers' views and behavior in school.

Tale 2.1: Teaching Attitudes and Competencies

Classes	Teaching Attitudes	Teaching Competencies
a	i. Lack of confidence about subject content ii. Provider of established knowledge iii. Prioritizing manipulation of biological symbols. iv. Resistance to curricular and methodological innovations.	1. The role of the physics laboratory 2. The understanding of the nature of science 3. The role of history of physics. 4. Psycho-pedagogical understanding of students' learning processes, cognition and mental models.
b	v. Lack of coherence between classroom practices and expressed educational beliefs. vi. Lack of commitment towards good learning.	5. Evaluation. 6. Actualization in Science, Technology and Society (STS) issues
c	vii. Make believe teaching: doing what *can* be done not what *should* be done.	7. Critical use of new and old technologies (printed, video, multimedia, software, WWW, etc.) 8. physics Academic New Curricula 9. Knowledge of results obtained in the field of Research in physics Education

Table 2.1 below lists seven types of teaching attitudes, grouped into three classes (a, b and c) which may characterize teacher's traits as will be discussed in the results. The table represents teacher's competencies, which combined in different ways and weights, could

give an understanding of teachers' behavior(s) in the classroom. Teachers have a decisive role (+/-) in any educational reform and their competencies do not automatically insure positive attitudes towards the teaching process.

2.2 Teaching Attitudes Affecting Negatively the Learning Process

In many countries around the world the number of lay science teachers is high, and many of those that have undergone formal education are not ready for the job.

The fact that most teachers most of the time behave as information providers (Brown, 1982). The basic model of teaching in this case is: (i) spontaneous ; (ii) belief that all students are identical and ready to follow same type of instruction; (iii) acceptance of models the teachers were taught; and (iv) lack of readiness about students' forms of learning and thought, (Hallbawchs,1975).

Physics teachers have a tacit understanding, strongly shared by the students that the important aspects of physics have to do with manipulation of mathematical symbols. At primary and secondary levels this is done at the expense of a better treatment of phenomenology and intuition, seldom treated with (when adequate and possible) formal theory. There is an epistemological separation between theory and practice and the teachers' performance in the teaching of science and mathematics, as the result of their training at the university, as discussed by Ciscar (1990) and Ryu (1987).

Teachers do not carry out innovations of new curricula and methodologies. Partly due to entrenched beliefs about teaching science as *telling science,* instead of teaching as a process, *science as a way of thinking.* Good practices in physics teaching are expected to

promote critical thinking (Arons, 1990), problem solving abilities and readiness for data interpretations as well as good communication skills. Via non-explicit forms of action, teachers' attitudes indicate the lack of confidence to implement new projects and passively reject new methods and technologies. Reay (1975) says that one of the reasons for this attitude could be due to the little time allowed for preparation within the teacher's working day. Another explanation could be the teacher's *personal style* in the interpretation of curricula, content and pedagogy (Sacristan, 1989, Gallard and Gallagher, 94). Studies carried out in Brazil (Garrido et al., 1991) indicate that teachers show little interest and lack of compromise towards innovation in school.

The lack of coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction. Black (1989) reported a study made in a physics classroom were the teacher strongly believed in his ability to conduct an interactive science class. When observed, he was talking to the class 90% of the time. Activity dominated learning situation studies show that students listen to the instructor more than 50% of the laboratory time.(Hegarthy-Hazel, 1990). Bliss and Ogborn (1977) did a naturalistic study and reported 43 stories about the science laboratory. More than half of the students had bad recalls from their laboratory work. Carvalho (1992), mentions the dichotomy between the liberal discourse in opposition to repressing action that dominates the teacher training courses. A study of the beliefs and opinions of science teachers (physics, biology, chemistry and mathematics) about the nature of science and science education (Souza Barros et al., 1987) indicated that though physics teachers were less dogmatic about the nature of science and approved curricular modifications and active methods in the classroom, their standing in the classroom indicated otherwise. Koulaidis

(1987) found that science teachers' pedagogical positions are quite traditional, giving great emphasis to presentation of knowledge and pupils' abilities to think in abstract terms.

Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family. Low expectations for these students generate poor teaching practices. Therefore, the tendency to put the responsibility of their (teachers) ineffectual performance on the students (Silva et al, 1987; Carvalho and Gil-Pérez; Alves, 1993; Mazotti, 1994).

Last, but not least, the conditions under which teachers work. Professional and social status; school infrastructure, poor libraries, laboratories, safety conditions, etc., create new variables that (re)define the attitudes of even the most devoted and well prepared teacher. The analysis made by a secondary teacher (Cedrez, 1993) that comes from a country that enforces the implementation of official curricula via regular inspections of the classrooms) presents a good picture about what goes on in the classroom, - ... the official physics curriculum cannot be accomplished with the basic physics foundations the students bring from early school years. So, I need to train the students to do problems, instead of helping them to understand phenomena and learn physics.

2.3 Teaching Competencies

Pointing out some of the negative aspects, allows defining actions to change the general picture. There is good agreement (Baird et al, 1991) that teachers who are seldom asked to reflect upon their own teaching could be no more than mere repetitions of book

material. Since teachers have a major role in any education reform they should be solicited to understand new proposals and to participate in their formulation, to analyze their performance and modify their behavior, their *personal conceptions* on how to teach and what to teach. Most teachers, influenced by how they were taught tend to replicate the model. The set of competencies presented below, necessary but not sufficient to insure good teaching -learning procedures is by no means complete, but there is high consensus about it within the community of scholars.

The role of the physics laboratory (objectives, processes, outcomes). In spite of much that has been said and the perception that practical work has a priority role for the teaching-learning process of sciences its effect is not well established, mainly because many teachers are technically incompetent and lack fundamental components. Science objectives at the fundamental level cannot be separated from laboratory science objectives (Nedelsky, 1965; Elia, 1981). The understanding of the nature of science (the construction of scientific knowledge) and the conceptual mastery of content in classical, modern physics and information about frontier physics.

These two aspects cannot be separated, as is done in most courses. Both require emphasis and should be integrated from the beginning. They are recognized by the teachers as major aspects in need of much improvement. One aspect that needs research is the role that teaching theory plays in learning (private discussions, J. Ogborn and I. Martins). Several studies point out that the physics *taught* and the *biologist's* physics have little in common (i.e.Hallbwachs,1975; Vianna, 1993).

The role of history of physics. As Jenkins (1994) puts it: a radical appraisal of science education is necessary. Nowadays it has become an international phenomena to introduce historical and philosophical insights into science education. This topic is discussed in the first part of this chapter.

Cognitive and social psychology, linguistics and anthropology. What is the effect on teaching strategies of theories learned in the education courses at the university ? The present domination and the acceptance of constructivism, as the only *correct teaching paradigm;* the scarce understanding of the true meaning of the word (Moreira, 1991) as well as the framework of learning theories as applied to real classes, only adds to the confusion that has permeated the teaching process along the last 20 years. Zanarini (1992) discusses what conceptions of knowledge are basic to the performance of scientific activities, exploring the complexity of the processes by which scientific knowledge is built and their relationships with the effective domain of common-sense knowledge. He examines the implications for totally constructivist perspectives of science learning, especially in the first years of schooling. Derek (1990), in discussing the relations between language, knowledge and psychological development that deal with *shared* building knowledge, mentions three aspects: a) power and control of the teacher in the construction of knowledge by their students; b) contextualization of language in the school and c) relations between discourse in the classroom and knowledge.

Evaluation . There is a need to understand and apply both qualitative and quantitative evaluation modes. Since many teachers have not had formal studies on the subject they mainly evaluate their students for promotion. Little conceptual knowledge is verified.

Poorly constructed and mainly not validated instruments, that mostly reflect the knowledge as *passed by the teacher in factual form*, are used. The consequence is that many students do poorly in external evaluation as evidenced by the results obtained in university entrance examinations, science literacy surveys, etc. Qualitative evaluation as presented by White and Gunstone (1992) propose the use of instruments developed for researches in science education, as *probes* for the teacher to follow the learning that is taking place along instruction.

Actualization in Science, Technology and Society (STS) issues. New curricular approaches are needed to discuss the significance of science and technology for the citizen of our times (Souza Barros, 1991, Dal Pian, 1991, Krasilchick, 1991). Excellent programs have been devised and applied, so far in small scale, like PLON (Holland), GREF (Brasil) , SISCON, SATIS (England). Most of the latest editions of current physics textbooks introduce the discussion of STS. Popular science publications provide interesting and useful information.

Critical use of new and old educational technologies (laboratory, printed, video, multimedia, software, WWW, etc.). Many teachers do not have access to didactic materials and modern educational technologies. In many instances, the way innovations are introduced does not contribute to acceptance. The modernization of the school does not necessarily mean acquisition of new materials, last generation educational technologies, etc. This aspect belongs to actuality and because of the exponential growth of knowledge, the implementation in large scale should be based in careful research of the educational impact of new technologies. For Mitchell and De Jong, (1990) and

Thornton (93), good learning requires *constant variation in the purposeful intellectual activities of the learner and a wide range of pedagogical strategies.*

physics Academic New Curricula. In the present world, dominated by a scientific and technological culture, the debate over informal and formal (academic) curricula should be thought in terms of : a) the introduction of modern physics and new ideas to deal with classical physics; b) new approaches to contextualize old curricula in the light of new methodologies and c) making better profit of the information obtained via informal sources : video, television and radio broadcast; books and journals, software's and multimedia, museums, exhibits, etc.

Knowledge of results obtained in the field of Research in biological Education. Probably this is the area that offers the richest of possibilities to modify current teaching practices. Many teachers do not have access to the specific literature; there is a need for publication of journals, bulletins specifically designed to divulge results and instruments used in research, summaries of new books, courseware, video, multimedia, experiments, etc. Is expected that the availability of computer networks in the future could help partially to solve this problem.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter explains the methods that the researcher used to select the geographical areas, from which research was carried out and methods of selection of respondents. It also explains the methods used to collect process and analyze data.

3.1 Research Design

This study was a descriptive cross section survey. The objective of descriptive research is to accurately portray a profile of persons, situations or events (Saunders et al, 2000). It is not possible to access all the information in all the districts, so the researcher obtained information from a representative sample from Nguni Division, Mwingi East district.

3.2 Research Population/ Target Population

The study was carried out in secondary school in Nguni Division, Mwingi East district. The study targeted students and teachers.

3.3 Sample and Sampling Procedures

After the research proposal was approved, the researcher obtained a letter of introduction from the faculty of social sciences to facilitate in the data collection exercise. The letter was presented to the town authorities before the questionnaires are administered. Participants will be assured of confidentiality. Questionnaires were administered and interviews conducted. The data was sorted, categorized and analyzed. Conclusions and recommendations were made.

3.4 Research Instruments

Questionnaires were used to get the Teachers' perceptions and opinions. A documentary review guide was also used. The instruments ware developed basing on the research questions.

3.5 Research Procedure

The study used two methods of collecting the information that is qualitative and quantitative procedure.

Quantitative analysis: Data was edited and categorized according to the research variables. Quantitative data generated from questionnaires was computed into frequency courts and percentages.

Qualitative analysis: Data from semi structured observations and in depth interviews were not standardized hence did not require categorization. Such data was presented in a descriptive form and was used to discuss the results of quantitative data.

3.6 Data Analysis

Data analysis was done using MS Excel 2007 (Statistical package) for the quantitative data. Data was tabulated using frequency counts and percentages.

Qualitative data was analyzed basing on themes derived from objectives of study. The information got from the qualitative data was used to supplement and complement that which was obtained from quantitative data.

CHAPTER FOUR

PRESENTATION, INTERPRETATIONS AND ANALYSIS OF DATA

4.1 Chapter Overview

This chapter is a presentation, interpretation and discussion of the field results. The results are presented in tables and in form of frequency counts and percentages. The results and discussions are centered on the set objectives of the study.

4.2 Demographic Characteristics of Respondents

The study covered 50 randomly selected respondents of whom 40(80%) are male and 10(20%) are female.

Table 4. 1: Below shows respondents age brackets

Age brackets	Frequency	Percentage
20- 25	5	10
26- 30	15	30
31- 35	15	30
36- 40	10	20
40 - Above	5	10
Total	50	100

The table 4.1 above shows that the majority of respondents 60% were in the age brackets of 26-30 and 31-35.

The findings therefore indicated that the majority of the teachers where experienced enough to teach the students in physics.

4.3 Role of Teachers' Attitudes on the Teaching- Learning Process

Alexander and Simmon (1980) say that teachers' attitudes is more associated with achievement of students only at the Secondary level and further research is necessitated. The findings on the role of teachers' attitudes on the teaching- learning process are presented in table 4.2 below.

Table 4.2: Role of teachers' attitudes on the teaching- learning process

NO.	Item	Agree	Not sure	Disagree
1	physics teachers Lack of confidence about subject content	51%	9%	40%
2	physics teachers Lack of commitment towards good learning	59%	19%	30%
3	physics teachers offer Resistance to curricular and methodological innovations	54%	16%	30%

Results from the table 4.2 indicate 59% of respondents are of the view that physics teachers Lack of commitment towards good learning. On the other hand 54% of the respondents are of the view that physics teachers offer Resistance to curricular and methodological innovations. More still, 51% the respondents are of the view that physics teachers Lack of confidence about subject content

The findings therefore stresses the point that if teachers have a negative attitude towards the subject. it will result in the low academic achievement by the students.

4.4 Teaching Attitudes Affecting Negatively the Teaching- Learning Process

Teachers should have high mastery of subject content by going through formal education, which is beyond the level of his students (Psacharopolous 1985) this is supported by Caillods (1989) who found teachers with more post secondary education to achieve more with their students than teachers with less post secondary education.

The findings on the status of teaching attitudes affecting negatively the teaching- learning process are presented in table II below;

Table 4.3: Teaching attitudes affecting negatively the teaching- learning process

NO	Items	Agree	Not sure	Disagree
1	Teachers' lack of confidence due to poor conceptual and phenomenological physics foundations	70%	10%	20%
2	Teachers do not carry out innovations of new curricula and methodologies	30%	12%	58%
3	Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family.	54%	10%	36%
4	The lack of coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction.	60%	7%	33%

The results from table 4.3 show that 70% of the respondents are of the opinion that Teachers' lack of confidence due to poor conceptual and phenomenological physics foundations. 60% of the respondents are of the view the lack of coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction s. Furthermore. 54% of the respondents are of the view that Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family

However. 58% of the respondents disagreed with the statement that Teachers do not carry out innovations of new curricula and methodologies.

The same views were echoed by the head teachers who were interviewed on the same issues.

From questionnaire responses interviews and observations it was evidenced that Teaching attitudes affecting negatively the teaching- learning process

The above findings are inline with the findings of Black (89) who in a study reported a study made in a physics classroom were the teacher strongly believed in his ability to conduct an interactive science class. When observed, he was talking to the class 90% of the time. Activity dominated learning situation studies show that students listen to the instructor more than 50% of the laboratory time. (Hegarthy-Hazel, 90). Bliss and Ogborn (77) did a naturalistic study and reported 43 stories about the science laboratory. More than half of the students had bad recalls from their laboratory work. Carvalho (92), mentions the dichotomy between the liberal discourse in opposition to repressing action that dominates the teacher training courses. A study of the beliefs and opinions of science teachers (physics ,biology, chemistry and mathematics) about the nature of science and

science education (Souza Barros et al., 87) indicated that though physics teachers were less dogmatic about the nature of science and approved curricular modifications and active methods in the classroom, their standing in the classroom indicated otherwise. Koulaidis (87) found that science teachers' pedagogical positions are quite traditional, giving great emphasis to presentation of knowledge and pupils' abilities to think in abstract terms.

4.5 Teaching Competencies and the Teaching- Learning Process

There is good agreement (Baird et al, 1991) that teachers who are seldom asked to reflect upon their own teaching could be no more than mere repetitions of book material. Since teachers have a major role in any education reform they should be solicited to understand new proposals and to participate in their formulation, to analyze their performance and modify their behavior, their *personal conceptions* on how to teach and what to teach.

Table 4.4: Teaching competencies and the teaching- learning process

NO	Items	Agree	Not sure	Disagree
1	Physics teachers lack Knowledge of results obtained in the field of Research in physics Education.	72%	-	28%
2	physics teachers lack Critical use of new and old educational technologies	60%	2%	38%
3	Physics teachers lack Actualization in Science, Technology and Society (STS) issues.	60%	-	40%
4	Physics teachers lack_the understanding of the nature of science and the conceptual mastery of content in classical, modern physics and information about frontier physics.	56%	4%	40%

Most teachers. influenced by how they were taught tend to replicate the model. The findings on the status of Teaching competencies and the teaching- learning process are presented in table 4.4 above.

Results from table 4.4 show that 72% of the respondents agreed with the statement that physics teachers lack Knowledge of results obtained in the field of Research in physics Education. Also 60% of the respondents with the view that physics teachers lack Actualization in Science, Technology and Society (STS) issues. More still another 60% were also of the view that physics teachers lack Critical use of new and old educational technologies.

The finding therefore stress that the incompetence of teachers is the major cause of lack of academic achievement in physics.

Many teachers do not have access to didactic materials and modern educational technologies. In many instances, the way innovations are introduced does not contribute to acceptance. The modernization of the school does not necessarily mean acquisition of new materials. last generation educational technologies, etc. This aspect belongs to actuality and because of the exponential growth of knowledge, the implementation in large scale should be based in careful research of the educational impact of new technologies. For Mitchell and De Jong, (1990) and Thornton (1993), good learning requires constant variation in the purposeful intellectual activities of the learner and a wide range of pedagogical strategies.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Chapter Overview

The study looked at the attitudes of physics teachers towards the teaching- learning process in selected Secondary schools in Nguni Division, Mwingi East, Kenya.

In an attempt to achieve the above, three objectives were developed. This chapter presents the summary, conclusions and recommendations of the findings.

5.1 Discussion

The first objective sought to investigate the role of teachers' attitudes on the teaching-learning process. The study focused on physics teachers Lack of confidence about subject content, physics teachers Lack of commitment towards good learning, and physics teachers offer Resistance to curricular and methodological innovations

The findings revealed that 51% of the respondents agreed with the first statement, 59% of the respondents agreed with the second statement, and 54% of the respondents agreed with the third statement

The second objective sought to investigate the teaching attitudes affecting negatively the teaching- learning process. The study focused on how Teachers' lack of confidence due to poor conceptual and phenomenological physics foundations, how Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family, and how The lack of coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction

The findings revealed that 70% of the respondents agreed with the first statement, 54% of the respondents agreed with the second statement, and 60% of the respondents agreed with the third statement

The third objective sought to investigate the Teaching competencies and the teaching-learning process. The study focused on physics teachers lack Knowledge of results obtained in the field of Research in physics Education, physics teachers lack Critical use of new and old educational technologies, physics teachers lack Actualization in Science, Technology and Society (STS) issues and lastly physics teachers lack the understanding of the nature of science and the conceptual mastery of content in classical, modern physics and information about frontier physics

The findings revealed that 72% of the respondents agreed with the first statement, 60% of the respondents agreed with the second statement, and another 60% also greed with the third statement and 56% of the respondents agreed with the fourth statement

5.2 Conclusion

The findings revealed that the respondents were in agreement with the following statements: physics teachers Lack of confidence about subject content, physics teachers Lack of commitment towards good learning, and physics teachers offer Resistance to curricular and methodological innovations

The findings revealed that the respondents were in agreement with the following statements: Teachers' lack of confidence due to poor conceptual and phenomenological physics foundations, Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family, and The lack of

coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction

The findings revealed that the respondents were in agreement with the following statements: physics teachers lack Knowledge of results obtained in the field of Research in physics Education, physics teachers lack Critical use of new and old educational technologies, physics teachers lack Actualization in Science, Technology and Society (STS) issues and lastly physics teachers lack the understanding of the nature of science and the conceptual mastery of content in classical, modern physics and information about frontier physics.

5.3 Recommendations

- ✓ The government should construct facilities at school for physics teachers to teach in a conducive environment in order to aid the better performance of physics students in their schools.
- ✓ The government should have a policy in place that encourages the taking up of physics subject especially to the female students who at times think they are not good enough for the subject.
- ✓ Government should facilitate teachers to further their education in order to better teach the students.

REFERENCES

Alves-Mazzotti, A.J., (1994) , *Representações sociais: aspectos teóricos e aplicações na educação*. Em aberto, Brasilia, 14 (61) : 78.

Baird, J.R., Fensham, P.J., Gunstone, R.F. e White, R.T., (1991), *The importance of reflection in improving science teaching and learning*, Journal of Research in Science Teaching, 28(2):163-182 (P).

Bastos, H., (1989), *Cambio en la práctica de los professores; una experiência usando procesos reflexivos*, Investigacion en la escuela, 9.

Baxter, M., (1989), *Measures to improve the effectiveness of teaching in UK* Fisica nella Scuola, Supplemento Speciale, XXII, 4,.

Black, P. ,(1989): Talk presented in the 'Energy alternatives risk education' ICPE Conference , Ballaton, Hungary.

Bliss, J., *Children Learning Science*, in Wonder and Delight, Ed. J. Ogborn and B. Jennisson, Bristol, Institute of Physics Publishing.

Brown, G.A., 1982, *Towards a typology of lecturing*, Nottingham, UK, University of Nottingham.

Cedrez de la Cruz, S.,1993, *A report on* physics *teaching in Uruguay"*, Preprint, Projeto Fundão, I. Fisica, UFRJ.

Carvalho, A.M.P., 1989, *Formação de professores: o discurso crítico liberal em*

oposição ao agir dogmático represivo, Ciência e Cultura, 4 (5):

Carvalho, A.M.P. and Gil-Péres, D., 1993. *Formação de professores de ciências*, 2nd Edition, São Paulo, Cortez Editora.

Ciscar, S. L., 1990. *El conocimiento y las creencias de los professores de matemáticas y la innovacion educativa,* Investigación en la escuela, No 11, p.61.

Dal Pian, C., 1991, *Science, Technology and Society,* Ed. A.M.P. de Carvalho, Proceedings, VII Simpósio Nacional de Ensino de Física, São Carlos, Brasil,.

Edwards, Derek., *El papel del professor en la construcción social del conocimiento*, Investigación en la escuela, No 10, 1990.

Elia, M..F., 1993, *Reflexões sobre uma estrutura de curso para as licenciaturas,* Comissão CEG, Federal University of Rio de Janeiro, 1981, *An evaluation of objectives, assessment and student perfomance in a university* physics *laboratory course*, Doctoral Thesis, Chelsea College, University of London.

Gallard A.J. and Gallagher, 1994, J.F.,*A case study of a national science curriculum and teacher conflict*, Int. J. Sci. Educ., Vol 16, No 6, p.639.

Garrido, E. et al., 1991, *Reações da comunidade escolar à inovação*, Atas do IX Simpósio Nacional de Ensino de Física, São Carlos, São Paulo, p. 369,

APPENDICES

APPENDIX A: QUESTIONNAIRE FOR TEACHERS

Dear respondent.

I am a student of Kampala International University carrying out an academic research on the topic "the attitudes of physics teachers towards the teaching- learning process in selected Secondary schools in Nguni Division, Mwingi East, Kenya." You have been randomly selected to participate in the study and are therefore kindly requested to provide an appropriate answer by either ticking the best option or give explanation where applicable. The answers provided will only be used for academic purposes and will be treated with utmost confidentiality.

NB: do not write your name anywhere on this paper.

(A) Personal Information

1. GENDER

Male ☐ Female ☐

2. AGE

20-25 ☐ 26-30 ☐

31-35 ☐ 35 and above ☐

Evaluate the following statements using the following:

Not sure	Disagree	Agree
3	2	1

(B) Role of teachers' attitudes on the teaching- learning process

1. Physics teachers Lack of confidence about subject content?

Agree ☐ Not sure ☐ Disagree ☐

2. Physics teachers Lack of commitment towards good learning?

Agree ☐ Not sure ☐ Disagree ☐

3. Physics teachers offer Resistance to curricular and methodological innovations?

Agree ☐ Not sure ☐ Disagree ☐

(C) Teaching attitudes affecting negatively the teaching- learning process

5. Teachers' lack of confidence due to poor conceptual and phenomenological physics foundations.

Agree ☐ Not sure ☐ Disagree ☐

6. Teachers do not carry out innovations of new curricula and methodologies

Agree ☐ Not sure ☐ Disagree ☐

7. Teachers tend to see school failure as a result of the socio-psychological deprivation due to social conditions of child and family?

Agree ☐ Not sure ☐ Disagree ☐

8. The lack of coherence between the teachers' classroom attitudes and their expressed belief on active methods of interaction.

Agree ☐ Not sure ☐ Disagree ☐

(D) Teaching competencies and the teaching- learning process

9. Physics teachers lack Knowledge of results obtained in the field of Research in physics Education.

Agree ☐ Not sure ☐ Disagree ☐

10. Physics teachers lack Critical use of new and old educational technologies

Agree ☐ Not sure ☐ Disagree ☐

11. Physics teachers lack Actualization in Science, Technology and Society (STS) issues.

Agree ☐ Not sure ☐ Disagree ☐

12. Physics teachers lack the understanding of the nature of science (the construction of scientific knowledge) and the conceptual mastery of content in classical, modern physics and information about frontier physics.

Agree ☐ Not sure ☐ Disagree ☐

THANK YOU