ASSESSMENT OF EDUCATION POLICY (IES) IMPLICATION ON THE POOR PERFORMANCE IN PHYSICS SUBJECT IN SECONDARY SCHOOLS:A CASE OF MOROGORO MUNICIPALITY, MOROGORO REGION

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by The Open University of Tanzania, the dissertation titled: ***"Assessment of Education Policy(ies) Implication on the Poor Performance in Physics in Secondary Schools: A Case of Morogoro Municipality, Morogoro Region",*** in partial fulfillment of the requirements for the Degree of Masters of Education in Administration, Planning and Policy Studies (MED APPS) of the Open University of Tanzania.

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Dr. Evaristo Mtitu

(Supervisor)

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Date

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DECLARATION

I, **Noel J. Mgani,** do hereby declare that this dissertation is my own original work, which has not been and will never be presented to any other University for a similar or any other degree award.

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Signature

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Date

DEDICATION

I dedicate this work to my parents, Mr. and Mrs. John Mgani, also to my wife Tusekile Mwamkinga, my children Sarafina, Jacob and Priscila.

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Special thanks to Almighty God, my parents and my family for their encouragement, love, and tolerance during my study.

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ABSTRACT

The study intended to assess the education and training policy(ies) implication for poor performance in Physics subject in secondary schools in Morogoro municipality, Morogoro region. The theory guided the study was Education for Self-reliance (ESR) backed up by the CIPP model. The mixed research approach guided the study using case study design. The study involved five (5) sample schools, where 12 participants were selected from each school using purposive sampling. Data were collected through questionnaires, interview, focus group discussion and document review. The findings of the study revealed that poor performance of Physics is due to the poor implementation of the education and training policy(ies). The education policy(ies) implementation has experienced the shortage of Physics labs and equipment, as well as incompetent Physics teachers. Secondly, Physics laboratories, equipment and resources impact education policy(ies) practice on Physics teaching and learning. Thirdly, qualification of the Physics teachers, their level of knowledge,skills and attitude are factors that challenge a policy against the quality of the Physics teachers. Lastly, use of modern technology and capacity building to Physics teachers are policy(ies) innovation mechanism to improve Physics performance. The study concluded that to improve performance in Physics, the education policy(ies) has to resolve all challenges related to equipment and resources such as; Physics laboratories and equipment, qualification of teachers and capacity building to Physics teachers. The study recommended that the policy makers, schools, community and students could cooperate in order to share strategies for improving performance in Physics subject. Finally, this study adds knowledge and therefore facilitates the effort to improve performance in Physics subject.

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LIST OF ABBREVIATIONS

CIPP	Context, Input, Process and Product
DC	District Commissioner
ESR	Education for Self-Reliance
FGD	Focus Group Discussion
ICT	Information and Communication Technology
MEST	Ministry of Education, Science and Technology
MMD	Morogoro Municipal Director
NECTA	National Examination Council of Tanzania
NGOs	Non-Government Organizations
OUT	Open University of Tanzania
PEDP	Primary Education Development Program
PISA	Performance in International Student Assessment
PSA	Policy Studies Association
RAS	Regional Administrative Secretary
SEDP	Secondary Education Development Program
SPSS	Statistical Package for Social Sciences
TIE	Tanzania Institute of Education
TTA	Tanzania Teachers Association
URT	United Republic of Tanzania.

CHAPTER ONE

THE PROBLEM AND ITS CONTEXT

1.1 Introduction

This chapter introduces the study. The chapter contains eight subsections, which include the following: introduction, the background of the research problem, statement of the problem and research objectives as well as research questions. Other sections in this chapter include; study delimitation, limitations and finally the operational definition of research terms or concepts.

1.2 Background of the Research Problem

Education plays a critical role in socio-economic, science and technology, and political development of any nation including Tanzania (URT 1993; UNESCO 2000). On the other hand, education is an avenue of training and learning, especially in schools or colleges, to improve knowledge and develop skills. The ultimate purpose of education is to empower an individual to excel in a chosen field of endeavor or career and to be able to positively impact his/her environment. On the contrary, the end results of the processes of education have failed to maintain a high degree of academic distinction and excellence amongst learners and recipients of education in institutions of learning as in these days (Assefa *et al.,* 2008).

Despite the heavy investment in education by the government, still, the performance of students in Physics subjects is poor. For example, data from Basic Education Statistics of Tanzania shows that the performance in Physics in ordinary level secondary schools is getting downward since 2002 to 2015 (ETP 2014). Also, the

Certificate of Secondary Education Examination (CSEE) results from 2005 to 2015 released by National Examination Council of Tanzania (NECTA) every year show the pass rate in Physics had never exceeded 50%. A recent study by Sintayehu (2014) on the performance of Physics in secondary schools showed that students perceived Physics as a difficult subject because of its abstract nature. Sintayehu (2014) reported that students who take Physics usually performed poorly at all levels of the educational system.

As the government decided to invest in science and technology, there was a need to improve the performance in science subjects including Physics in order to expedite innovations and technological development. The education and training policy (ETP) of 1995 emphases on "science as the essential component of education and training in the whole education and training system" (ETP 1995, p. 56). Due to the importance of science, the government tried to change the education and training policy of 1995 and go with some plans to improve the situation in the science learning in secondary schools such as the construction of science laboratories from 2006, yet the performance in science subject, especially Physics subject in secondary schools has continued to be poor.

In 1996 a new policy was introduced known as Education and Training policy (ETP) aiming at improving the quality of education and training at all levels. Among of its emphasis was that each secondary school has to build laboratories and recruiting many science student teachers in diploma level and university level. Alsoin 1999 the national policy of higher education was formulated that aimed at enrolling more science students in all sex at the university level. This declared the government effort

to built in escalating morally on the students to dear science subject. However, in 2007 another policy known as information and communication technology for primary education which was emphasizing on the use of science and technology in primary level was formulated in order to strengthen science education.

As part of the education and training policy implementation (ETP, 1995; p.54), the present senior secondary school Physics curriculum is built on the conception of science as both product and process. As a process, Physics has to do with the skills that are called into play by scientists in carrying out scientific investigation. This implies adopting an inquiry method in the teaching of Physics at the secondary school level. As a product, Physics is viewed as consisting of scientific facts, principles, laws and generalizations derived from scientific investigations. The new curriculum of science (Physics) adopts a child-centered approach, that is the teacher is supposed to provide guidance to the students who should participate actively in the teaching-learning process (Edward et al., 1999). Although there was a shift in focus on the Physics curriculum practice, still the performance in Physics has not improved compared to other subjects, and has been an area of concern by the government.

Physics is a fulcrum on which science and technology in education are linked on for the economic development of any nation, including Tanzania. If students cannot perform well in Physics, the dream of development and transformation of the economy through science and technology won't be realized. This made the researcher to develop a concern over how education and training policy(ies)imply on the poor performance in Physics subject in secondary schools.

The poor performance in Physics has been an international concern. For example, Program for International Student Assessment (2014) survey study on Physics performance, which was conducted in 65 countries in 2014 shows that 25 countries had improvement in Physics performance, 25 have no change in Physics performance, while 14 countries still perform worse in Physics. The study shows that Asian and European countries are doing well compared to other continents because they allocate more resources to the teachers, provide facilities and prioritize investment in teacher quality, not classroom size. PISA (2014) data show that 33% of students involved in the study failed to master even simple concepts of Physics problems. So, the poor performance in Physics is not the concern of Tanzania only, this is the global problem.

In sub-Sahara Africa, Schultz (2002) as cited by Nyandwi (2014) states that investing in education leads to faster growth for developed and newly industrialized countries. That is the reason to why; developing countries, especially in sub-Saharan Africa are now paying attention to invest in education from secondary by constructing laboratories and influencing students to opt Physics subject. In East African countries, the performance in Physics subject is still poor, maybe due to the nature of the subject itself, the education and training policy of the country or availability of teaching and learning resources.

In Tanzania, the data from National Examination Council of Tanzania shows that the performance in Physics subject has never exceeded 50 % (NECTA, 2012). Also, Morogoro municipality is also experiencing poor performance in Physics among secondary school students. Certificate of Secondary Education Examination Results

(CSEE) of 2015 as reported by NECTA show that the overall pass rate in Physics was 34.7% of all school candidates who sat for Physics National Examination (PNE) in the government-owned secondary schools in the municipality. This shows that more than 65.3% of students got "F" grade in Physics Examination. The case is similar to that of the National pass rate,where less than 50% of candidates passed and more than 50% failed the National Physics Examination.

Various studies have been done to explore challenges and factors contributing to poor student performance in Physics. For example, a study by Nywandwi (2014) advanced the factors such as attitudes of students, teachers, and community toward Physics. Other studies have advanced factors such as anxiety, teachers' competence, poor school infrastructure, lack of textbooks, the language of instruction, poor classroom conditions, motivation to both teachers and students, and teacher pedagogical knowledge and skills.

Therefore, the trend in Physics performance and other factors from a variety studies illuminate the implication of the education and training policy(ies) towards Physics teaching and learning in secondary schools as the policy(ies) innovation mechanism for improving Physics performance.

1.3 Statement of the Problem

The importance of sciences, especially Physics in scientific, technological and industrial developments in any nation cannot be neglected (Nguru, 2010). However, one cannot ignore the fact that teaching and learning process of these subjects

primarily involve learners, resources and the teachers. The learners interact with teacher, learning and teaching resources for the performance to be realized (Mabula, 2012; Msoka et al, 2015). According to Kihwele (2014), how the teacher apply the knowledge and skills acquired during the time of training, also how the teacher uses and executes the available teaching resources, and how the teacher and learners build interest towards Physics is likely to affect the performance of students in the subjects.

The poor performance in Physics has led to the dropout of students who wish to study Physics at higher levels of education. According to a study by Mabula (2012) out of 350,904 candidates who set CSEE, 60.4% dropped Chemistry and 74% dropped Physics. However, Nyamba and Mwanjombe (2012) in their study on student poor performance in science subject in Udzungwa secondary school in Kilolo, Iringa reported that the dropout in Physics is extraordinary. The nine past years report shows that the student pass rate in Physics in 2004, 2006, and 2008 were 45%, 46%, and 44% respectively (URT, 2008).

Despite the heavy investment in education by the government, parents and private sectors, the performance of students in Physics in secondary schools has continued to be poor. NECTA examination reports show that since 2011 up to 2015 the pass rate in Physics subject at CSEE has been continued to be under 50%. Examination reports show that the performance in Physics were 43.02% in 2011, 43.51% in 2012, 44.14% in 2013, 46.71% in 2014 and 44.30% in 2015 (BEST, 2015). This means that half of the candidate scored “F” grade in Physics in their CSEE.

Despite the efforts made to improve it, the achievement of Physics has remained poor in most parts of the country. Morogoro Municipal has been identified by the researcher to be one of the areas that perform poorly in Physics subject. Without over-emphasizing about improving performance in Physics, the drop out in Physics could continue, and this could affect most of the secondary school graduates from pursuing sciences-oriented courses at tertiary levels, produce dependent-minded graduates and continue to widen the gap between the rich and the poor.

On the other side the poor performance in Physics if it is left to persist, it may lead to retarded scientific, technological and industrial development both within and outside the country, and hence the target of the country to be a middle-income country by 2025 with industrial economy could not be realized.

On the other hand, Kihwele (2014) did a study on student perception of science subject and their attitude in Tanzania Secondary Schools, in Ifakara. He found that, student hasthe mentality that science subjects are difficult and are for few intelligent students. Also, Msoka (2015) did a study on developing and piloting interactive Physics experiment for secondary schools in Tanzania. His study reported that students lost interest in Physics and they increased interest through interactive Physics practical and experiments. Nguru (2010) in his study on the analysis of practical work and performance in Physics at OLSS, Iringa, Tanzania reported that building of laboratory and provision of equipment, increase the number of Physics teachers, and provision of incentive and designing of effective practical assessment could improve performance in Physics in secondary schools.

Although many studies were done to investigate the problem of the poor performance in Physics, yet there is a little improvement in this subject, and as you advance in higher levels of education, the number of students who opt for Physics decreases day to day from advanced level to the university (Mabula, 2012). It is argued that despite the concentrated efforts by government, teachers and private organization to provide resources and other components aimed at enhancing Physics performance yet the achievement is poor.

The concern about poor performance in Physics among students in secondary schools points an accusing finger on the education and training policy(ies) implication on Physics teaching and learning in secondary schools. In response to these arguments, there is the need then to carry out a study to assess the education and training policy(ies) implication on the poor performance in Physics in secondary schools.

1.4 General Objective of the Study

The general objective of the study was to assess the education and training policy(ies) implication for poor performance in Physics subject in secondary schools in Morogoro municipality, Morogoro region.

1.4.1 Specific Objectives

The specific objectives of this study were to:

(i) Assess education policy(ies)in relation to students' poor performance in Physics subject in Morogoro Municipality.

(ii) Investigate education policy(ies)in relation to the availability of Physics teaching and learning resources in Morogoro Municipality.

(iii) Assess the education policy(ies)in relation to the availability of quality Physics teachers in Morogoro Municipality.

(iv) Investigate education policy challenges on the effective and efficient teaching and learning of Physics subject in Morogoro Municipality.

(v) Assess education policy(ies) innovation mechanisms to improve the performance in Physics subject in Morogoro Municipality.

1.4.2 Research Questions

(i) What are the education policy(ies) relation on the students' performance in Physics subject in Morogoro municipality?

(ii) What are the education policy(ies) relation on the availability of Physics teaching and learning resources in Morogoro Municipality?.

(iii) What are the education policy(ies) relation on the availability of quality Physics teachers in Morogoro Municipality?

(iv) What are education policy(ies) challenges for effective and efficient teaching and learning of Physics subject in Morogoro Municipality?.

(v) What are the education policy(ies) innovation mechanisms to improve the performance in Physics subject in Morogoro Municipality?

1.5 Significance of the Study

Since Physics is important in students' daily life as well as the technological advancement in any country, there is a fundamental need to boost performance in Physics subject in secondary schools. In this respect, findings of the study would benefit Morogoro municipality secondary schools in devising strategies to address

education and training policy(ies) challenges and ultimately improve school environments as well as teacher and students performance in Physics at large. The study is also envisaged to be an integral input to efforts by such education stakeholders as TTA and NGOs in their bid to mitigating challenges faced by Physics teachers and students in secondary schools. To the policy makers at various levels such as Ministry of Education, Science and Technology (MEST), the study is envisaged to encourage review of policies, regulations and practices that would help to minimize areas hinder effectiveness and efficiency in Physics education. Finally, the study is expected to contribute to the body of knowledge of administration of policy and planning in education.

1.6 Scope of the Study

The study was confined to the assessment of the education and training policy(ies) implication on the poor performance in Physics in secondary schools. To that end, the study contains two variables, namely education and training policy(ies) (independent variable) and poor performance in Physics (dependent variable). The study has been undertaken in Morogoro municipality, in Morogoro region. The study confined in government secondary schools and therefore, private secondary schools were not considered in this study.

1.7 Limitation of the Study

Limitation of the study refers to conditions beyond the researchers' control that may place limits on the study conclusion and its application to other situations (Best and Kahn 1998). This study encountered the following limitations; during data collection some of the sampled secondary schools were in the mid-term break thus the

timetable scheduled for data collection increased as the researcher had to wait until the mid-term break is over. The sample was also small due to the limited fund and time allocated for the study. The study was limited by the shortage of information from participants related to the education and training policy(ies) because many of them had limited knowledge about education and training policy(ies). The researcher complemented participants' data with collection of secondary information to answer the study questions. Again the study was limited by unsatisfactory responses from among the teachers who were not being ready to receive and respond to the questionnaire provided. In order to overcome such a limitation, the researcher decided to clarify the intention of the study and convinced them for free participation.

1.8 Organization of the Study

This study is organized into five chapters. Chapter one is an introduction to the study. Chapter two deals with the literature review. Chapter three is about the methodological solutions of the research. Chapter four deals with the data presentation, analysis and discussion. Chapter five is about the summary, conclusion and recommendations.

1.9 Definition of Key Concepts

This section defines the main concepts used in the context of this study. These concepts include; policy, Physics, and low performance. To have a common understanding of these variables, the researcher has defined these variables from the literature and postulates how they will be referred to this study.

1.19.1 Policy(ies)

Policy(ies) in this study is taken as the statements which have officially made in documents which explain the provision and the implementation of educational curriculum in secondary schools.

1.19.2 Physics

In this study, Physics is referring to the one among science subjects which are taught in secondary school both theoretically and practically.

1.19.3 Low Performance

In this study, low performance is referring to poor grades of students in Physics Examinations compared to other science subjects.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents the review of literature on the education and training policy(ies) implication on poor performance in Physics in secondary schools from the scholarly point of views. It has six main sections which include; introduction, theoretical framework, conceptual framework and empirical studies. Other sections include syntheses of literature and chapter summary.

2.2 Theoretical Literature Review

This study was guided by Education for Self-Reliance (ESR) policy. ESR was formulated by the late Mwalimu Julius Kambarage Nyerere (the first President of Tanzania) in 1967 in Arusha as the critique to colonial education. The declaration that came out of the meeting was called Arusha Declaration. Arusha Declarationlayed out the socialist principles which were to be followed by Tanzania as the Nation. It states that Tanzania strives to reach equality, and should have respect for human rights, for the dignity of all citizens. Another principle was sharing of resources and work for all without any kind of exploitation.

In order to achieve the above objectives, the education for self-reliance policy was introduced to give directives on the role of education in equiping Tanzanians with African socialism ideology which would fit better to the newly attained independence than the former colonial education.

In short, ESR was criticizing the inherited colonial education. Nyerere (1967, p.47) states "the independent state of Tanzania inherited a system of education which was in many aspects both inadequate and inappropriate for the new state". Through ESR, Nyerere addressed the shortcoming of colonial education as follows: it was elitist in nature which catered the needs of few people who could afford schooling and it divorced its participants from the society in which they are supposed to live. Basically, Nyerere was concerned about how colonial education discouraged the integration of pupils into the society as a whole and promoted the attitude of inequality, intellectual arrogance, and individualism among few who were able to enter the school system.

Furthermore, ESR policy wanted to bring changes in contents to suit Tanzanian context. As a result, ESR changed focus and insisted education to base on learning by doing and not theoretical oriented. As Nyerere said:

> "*We cannot integrate the pupils and students into the future society simply by theoretical teaching'' (*Nyerere, 1967).

This ESR policy was a philosophy that shaped the national education and training policy of 1995 which state that the formal school curriculum should focus on the teaching of language, science and technology, humanities and life skills (ETP, 1995; p.54) and science education policy of 2010 which emphasized on the construction of laboratories in each secondary school that would help students to learn science subjects by doing (practical). According to ETP of 1995, it stated that "the government shall ensure that adequate resources are made available and provided to enhance access and equity in education" (ETP 1995, p.41). The education and training policy of 1995 continues to insist that "science and technology shall be

essential components of education and training in the whole education and training systems.

Using ESR policy as the foundation, a theoretical framework emerged from the literature review shows that there is a strong indication that education and training policy(ies) is a factor that influences the science learning (Physics) in secondary schools. In addition, the good performance in Physics depends on the education and training policy(ies) with reference to resources allocation, quality of the teachers, and how challenges are solved. Theoretical literature indicates that students may achieve good performance in Physics if they are learning by doing, and what they are doing in Physics which is relevant to their daily living experiences and they may apply in daily practices, may improve performance in Physics subject.

2.3 Conceptual Framework

This study was guided by the CIPP (Context, Input, Process and Product) model whereby the independent and dependent variables were considered as shown in Figure 2.1.

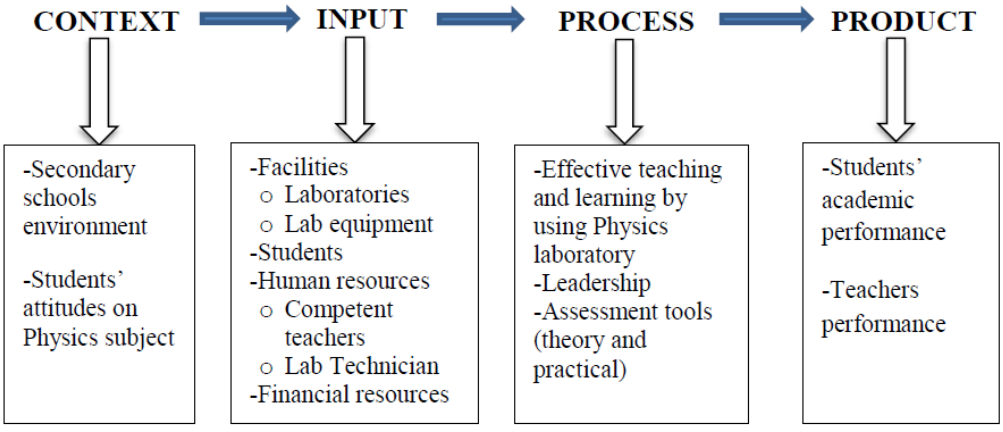

Figure 2.1: Conceptual Framework

Source: Adapted and Modified from Stufflebeam, D. L. (1972)

This conceptual framework shows the education and training policy implication on students' poor performance in Physics subject in secondary schools, whereby the independent variable is the education policy(ies) and the dependent variable is poor performance.

Physics performance of secondary schools students may be influenced by several factors based on poor implementation of the education and training policy(ies), effective teaching which depends on competence (quality) of Physics teachers, the presence of laboratories which involves the availability of laboratory equipment, laboratory technicians and know how to use the apparatus found in Physics laboratories.

However, if good education and training policy(ies) were well implemented, can help to improve the performance of the students in Physics subject. The education and training policy(ies) affect the performance of Physics subject by directly or indirectly by increasing or decreasing the student average score of grades A, B, C, and D to pass or F for failing in ordinary levels and A, B, C, D, E, S and F for advanced level. These have an effect on the performance of the national examination of both form four and form six on the first, second and third class divisions. Due to these, in turn, it affects the number of students to join form five for advanced level studies taking Physics and those joining universities and with interest of taking the Physics subject.

2.4 Policy(ies) Relations on the Poor Performance in Physics

The problem of poor performance in Physics in secondary schools has already studies by different researchers with varied findings coming up as the following studies exposed;

The study by Speering & Rennie (1996) on student perceptions about Physics in western Australia showed that the transition from primary to secondary school affects the interest of students to take science (Physics) subject in their higher studies and affects performance in Physics. Their study extended that students perform poorly in Physics because, during the transition from primary to secondary school, there is a considerable change in the organization of the school, the curriculum and the teacher student relationship. The study concluded that poor performance in Physics is the result of student perceptions that science in secondary school was not what they had expected.

Another study conducted by Onah & Uguru (2010) in Ebonyi North education zone of Ebonyi state in Nigeria on factors which predict performance in secondary school Physics in 20 secondary schools, exposed that teacher qualification and laboratory facilities have a significant impact on the student performance in Physics. The study concluded that for enhancing performance in Physics, all schools should have well equipped Physics laboratories and the qualified Physics teachers who can analyse and implement the Physics curriculum both in theory and practice.

The study conducted by Godwin, Adrian, & Johnbull (2015) on the impact of Physics laboratory on students' performance in Physics was carried out among senior secondary school students offering Physics in Ethiope West Local Government Area of Delta State using descriptive survey. The findings revealed that Physics laboratory helps in the teaching of Physics in secondary schools, in Ethiope West L.G.A. of Delta State, because 87.2% of the respondents accepted that Physics practical improve learning that stimulates positive impact. The study extended that there is a

significant relationship between students and teachers during experimental classes. The study concluded that Physics laboratory helped to inculcate scientific reasoning among Physics students and Physics laboratory enhances students' performance in Physics in secondary schools in Ethiope West L.G.A. of Delta State respectively.

The study conducted by Munene (2014) in Gatundu district in Kenya on the factors affecting the enrollment and performance in Physics among students in secondary school showed that students who performed poorly in Physics had low attitude and those who had good performance had a high attitude toward Physics. The study extended that there was high enrollment in Physics in schools with adequate resources than schools with inadequate resources. The study concluded that teachers should use the teaching and learning resources effectively to improve visualization of the concepts in order to improve performance in Physics.

The study conducted by Musasia et al (2016) in Kenya on the mode of study in Physics performance reported that teacher centered mode of study caused poor performance in Physics subject. The study suggested that structured practical work can aid the study of Physics and improve Physics performance. Thus, there is a need to shape policy on the nature and quality of practical work to be encouraged in Physics instructions.

In supporting the above study, Lyon (2005) acknowledged that the decline of interest among young learners in science subjects in Tanzania and the poor performance in science is a result of how science is taught and learned. He argues that Physics is taught theoretically, and very few schools have laboratories. This situation leads to

poor performance in Physics. This reveals that education and training policy of 1995 was not making follow up on how Physics is taught in secondary schools.

Centrally to this, speaking in the Parliament session in 2008, the Minister for Education and Vocational Training Prof. Jummanne Maghembe noted that, there was a drop in science subject choice for students in secondary schools, especially for those joining Advanced Secondary Education in Tanzania. This was specifically in Mathematics, Biology, Physics and Chemistry where the decrease was said to range from 30% in 2005 to 25% in the year 2009 (NECTA, 2005; 2009). This implies that the Tanzania education and training policy(ies) should check the situation and issues related to the Physics performance in secondary school.

2.5 Education Policy(ies) Practice on the Availability of Physics Teaching and Learning Resources

Physics is perceived as a difficult course for students from secondary school to university and also for adults in post-graduate education (Speering and Rennie, 1996). It is well known that both high school and college students regard Physics as a difficult subject. According to ETP (1995, p.41), it stipulates that "the government shall ensure that adequate resources are made available and provided to enhance access and equity in education". The school has a greater responsibility of providing conducive environment both in and out of the classroom for students to compete favorably in learning science (Joseph, 2014).

The study by Nguru (2010) on the analysis of practical work and performance in Physics at OLSS, in Iringa, Tanzania exposed that secondary schools lack laboratory

and equipment in order to improve the Physics teaching and learning, especially in conducting practical. Thus, the study suggested the government should build laboratories and provide laboratory facilities and resources as well as to increase the number of Physics teachers in secondary schools.

The laboratory has long been considered useful to develop conceptual understanding, but some recent courses have been developed that rely heavily on laboratory experience, in contrast to conventional teaching methods, for the development of conceptual understanding of Physics (Msoka, Mtebe, Kissaka & Keliye, 2015). They stress that presence of laboratory and its apparatus together with laboratory technicians make the teaching and learning of Physics more effective to both teachers and students by doing practicals and theory.

Again, Laboratory helps to provide a forum whereby the learner is given the exercise to the subjects, his beliefs, ideas, statements, theoretical propositions to some forms of the experimental test (Soyibo, 1987) as cited by Nyandwi (2014). This is an indication that Physics laboratory is very essentials to the students in secondary school in facilitating their academic performance in Physics subject. In his study, he did not show clearly how laboratory being Physics or Chemistry should look like. The study at hand indicates the qualities of Physics laboratory and how it facilitates or activates student's performance in Physics subject.

Also, according to Ango (1990), students' poor performance in Physics globally is basically due to lack of involvement of students in the teaching and learning activities right from the beginning of any new concept to be taught, lack of qualified

teachers as well as experiences in teaching and unavailability and/or insufficiency of materials in the laboratories. It has also been observed that conditions that would instil effective teaching such as resources available to teachers, general conditions of infrastructure as well as instructional materials in public secondary schools in Nigeria are poor (Oredein, 2000). This indicates that unavailability or insufficiency of materials in the laboratories is the problem in many countries in Africa not only in Tanzania. This hinders effective teaching and learning of Physics.

However, adequate facilities promote students' performance in one way or another. George (2000) revealed that the inadequacies of furniture fitting and equipment in the classrooms and laboratories where teaching and learning of science subjects took place might contribute to misconceptions and alternative conceptions. According to Kihwele (2014), such conceptions develop the mentality that Physics is difficult and it is for few with intelligent because it is difficult to deal with the abstract concepts in Physics. There is a need to link Physics with facilities that will help to visualize concepts (Munene, 2014).

Literature shows that Physics is considered as the most problematic area within the realm of science (Rivard & Straw, 2000) and therefore the need of review of policy(ies) on how it should be treated for the provision of resources is important for improving performance. Nguru (2000) adds that well-equipped Physics laboratories in secondary schools will attract many students to opt for Physics and the education and training policy(ies) should be clear on the allocation of resources in Physics. The study at hand examined the availability of Physics laboratories, equipment and human resources as stated in the education policy(ies).

2.6 Policy(ies) Relation on the Availability of Quality Physics Teachers

The quality teachers are required to engage students in practical works involving conducting experiments with the aim of developing their scientific knowledge and experimental skills, and at the same time arousing and sustaining the interest of the students in the subject as well as cultivating their attitude positive to Physics and Physics related phenomena. Students need to actively construct Physics knowledge by being purposefully involved in posing questions, determining claims and providing evidence (Thomas & Brain, 2006 as cited by Ojedirani *et al.* 2014).

Teachers have been shown to have an important influence on students' academic achievement and they also play a crucial role in educational attainment because the teacher is ultimately responsible for translating policy into action and principles based on practice during interaction with the students (Afe, 2001 as cited by Akiri&Nkech, 2009). It seems that low performance of students in Physics subject has a relationship to the effectiveness or quality of the teachers. Similarly to this, the study found that teachers who were rated as ineffective actually produced students of lower academic ability (Akiri and Nkech, 2009).

A document prepared by Policy Studies Association (PSA) reviewed in 2014 in Washington DC indicated that students' achievement is more heavily influenced by teacher quality. The research on policy document showed that the most significant gains in students' achievement are likely to be realized when students receive instructions from good Physics teachers over consecutive years. The study suggested that students perform poorly when being taught by unqualified Physics teachers (PSA, 2005). This indicates that the education and training policy(ies) should

noticehow Physics teachers are prepared in order to become competent enough in teaching students in both theory and practical in Physics, ultimately to improve performance.

This study investigates whether the education policy ensures the Physics teachers in terms of how they were prepared from the teachers' colleges or the university and if they get in-service training at their working stations.

2.7 Policy(ies) Challenges on Effective and Efficient Teaching and Learning of Physics Subject

The education policies are good but has some challenges as addressed by the United Republic of Tanzania (URT) of 2001 in the education and training sector development programme document which include inadequate teaching facilities/equipment consumables (e.g. laboratories and libraries), inadequate control of quality of the subsector, inadequate maintenance on infrastructure, inadequately trained teachers in both number and quality, inadequate in-service training of teachers, non-existence of ICT facilities, number of implementation related constraints, lack of professional ethics of teachers, and inadequate financing of public schools.

The study by Nagll, Obadovic and Segedinac (2015) in Serbia on Teaching Physics in the modern society showed a lack of efficiency, as well as the discrepancy between goals and the quantum and quality of students' knowledge. Teaching Physics in elementary and grammar schools in Serbia was inefficient. The problem was solved by introducing modern teaching methods, especially the scientific

method. The study commented that teaching is not oriented to content, whose adoption allows the student to cope with the same or similar situations, but the method of their application in an unfamiliar situation allows the student to solve the problem. The study concluded that school classes fulfill their mission of quality preparation of students for further education, application of knowledge in the world of work or in everyday problem situations.

The study of Akinbobola (2005) on the assessment of the enhancement of transfer of knowledge in physics through the use of effective teaching strategies in Nigerian senior secondary schools where he used non-randomized pretest-posttest control group design to 278 physics students on transfer of Knowledge Test in Physics (TKTP), showed the internal consistency of 0.76 using Kuder Richardson formula 21. The results showed that guided discovery was the most effective in facilitating students' transfer of knowledge in Physics. This was followed by demonstration while expository was found to be the least effective. Also, there exists no significant difference in the transfer of knowledge of male and female Physics students taught with guided discovery, demonstration and expository teaching strategies. The study recommended that guided discovery and other student-centered teaching strategies should be adopted for teaching various concepts in physics so as to engage the students in various activities for meaningful acquisition and transfer of scientific knowledge processes and ethics. Also, Physics teacher must emphasize on variety of procedures for promoting insight, meaningfulness, organization of experience, discovery of interrelatedness among ideas and techniques, and the application of knowledge acquired in one situation to a variety of situations

A study by Skurski (2008) on the method of teaching and learning Physics in Poland showed that teachers and students are offered a great variety of methods. Teachers are advised to organize their lessons (and the whole teaching process) in an interactive way and use active (stimulating, motivating) methods of teaching. These methods are supposed to "force" students to become more active leading them to the precisely defined teaching targets (goals). The study holds the opinion that using only one specific method is enough for students to learn physics successfully. The study concluded that the main tasks of any Physics teacher are to help students realize the purposes and the essence of this method as well as create favorable conditions so that students can use this method consciously and more and more independently.

The study by Snepscheut (2000) on Instructional Implications: some effective teaching methods, in theory, revealed that there is no difference between theory and practice found on what the students are actually doing in class and the focus of the subject. The study insisted that Laboratories are of the guided discovery type; that is, students are guided to observe phenomena and build for themselves the fundamental ideas via observation. The course may include explicit training of reasoning. Students are expected to be intellectually active during the class. Active-engagement classes may occur as part of a larger class—as a recitation or laboratory combined with a traditional lecture.

The empirical studies have shown how effective and efficiently Physics can be taught in secondary schools in order to improve performance. Unfortunately, all the

studies were not able to establish the link between the education and training policy(ies) with the effective and efficient way of teaching Physics. Thus, there is a need to assess the policy(ies) relation with other challenges like poor quality of teachers, unavailability of teaching and learning resource and poor perception of the student towards the effective and efficient teaching of Physics.

2.8 Research Gap

The literature review has showed that many studies investigated and reported why there is poor performance in science subject especially Physics subject. These studies mentioned different factors for poor performance of Physics subject such as negative attitude towards Physics subject, absence of qualified teachers and laboratory technicians, lack of laboratories and shortage of Physics laboratory equipment in secondary schools which result in the poor performance, but the relation between the education policy(ies) and education policy(ies) contribution to the poor performance were not shown clearly. Therefore, this study shows the link between education policy(ies) and the poor performance in Physics subject in secondary schools.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter addresses the methodological aspect of the study. The chapter covers the research design, research approach, study area, population, study sample and sampling techniques, research instruments, data collection procedures, data analysis, validity and reliability of the instruments, and ethical considerations.

3.2 Research Design

The research design is the framework under which the research is to be conducted (Kothari, 2012). It involves setting, the general aim, developing research questions, selecting research approaches, identifying participants of the study, preparing instruments of data collection and deciding on the procedure of data presentation and data analysis (Chambulila, 2013).

The researcher employed the case study design. In this case, the researcher favored a case study design because it helped the researcher to study the views of the teachers and students in their natural environments on how Physics is taught and learned and how the education policy(ies) influence the performance. The case study also helped the researcher to get the deeper insights about the facilities in schools, teaching and learning resources, student performance in Physics, also the teachers and students thoughts toward the relationship between education policy(ies) and the improvement of Physics performance in secondary schools. Kothari (2005) argues that a case study is a form of qualitative analysis whereby careful and complete observations of

the individual(s) or situation(s) or institution(s) is done for in-depth study rather than breadth.

The case study design helped the researcher to obtain the detailed report that was built on narratives, tables, figures, and texts. Therefore, the case study was used to assess the education policy(ies) implication on poor Physics performance in the five (5) secondary schools. In these schools, Physics teachers and students were purposively selected so as to critically examined the teachers view on the education policy(ies) relation to poor Physics performance, quality of the teachers, availability of the teaching and learning resources, and policy(ies) innovation mechanisms to improve Physics performance in secondary schools.

On the other side, the content analysis under the qualitative approach was used to analyse the responses based on the relevant theme, and the excerpts were made from the respondents' responses rather than the researcher interpretations. The case study design helped the researcher to obtain rich information and deep understanding of the phenomenon under study. The phenomenon under study is the assessment of the policy(ies) implication on poor performance in Physics in secondary schools.

3.3 Research Approach

Research approach refers to the way in which the research is conducted to yield the best results (Best and Khan, 2005). There are three major types of research approaches which has been identified, namely: Qualitative, Quantitative and Mixed research approaches (Creswell, 2005).

Qualitative approach is based on understanding the social phenomenon from the perspective of the participants (Cohen, Manion & Morrison, 2011). Qualitative is flexible and focus on interpretation. On the other side, the quantitative research approach is based on the establishment of the relationships between variables and explains the causes in measured social facts(Creswell, 2005). The mixed approach involves the use of both qualitative and quantitative approaches in the same study (Cohen, Manion & Morrison, 2000).

This study was guided by the mixed research approach because the nature of the problem under investigation influenced the researcher to collect both qualitative and quantitative data. Secondly, the nature of the research questions suggests the possibility of dealing with a collection of both qualitative and quantitative data. The research questions and the objectives are built around quantification of the facts and understanding the problematic situation of the education policy(ies) implication on the poor performance in Physics in secondary school.

3.4 Study Area

The study was conducted within Morogoro Municipality in Morogoro region. The selection of the study area was influenced by the following reasons; Morogoro Municipality had the best schools, also teachers prefer to work in town centers where living facilities like electricity, good transport network and water supply for domestic use are available, and the researcher expected to meet with experienced teachers in Physics teaching in town schools. Also, the area had a reasonable number of Physics teachers with great experiences in teaching and education policy(ies) experiences from whom reasonable data to fulfill the objectives of this study could be obtained.

The Municipality has forty nine (49) ordinary level secondary schools where twenty three (23) are publicly owned and twenty six (26) are privately owned. The researcher studied only five (5) secondary schools where Physics was taken as the prior subject, had somehow good performance in Physics, many students who were taking Physics and adequate Physics teachers.

3.5 Target Population, Sample Frame and Sample Size

3.5.1 Sample Population

The target population is the group to which the researcher is interested in gaining the information and drawing the conclusion (Kothari, 2005). In this study, the population included teachers in secondary schools in Morogoro Municipality and the students. From the population, the Physics teachers were targeted by the researcher because they are major argent in curriculum implementation as they receive, interpret and implement any curriculum package including assessing and evaluating the Physics curriculum and students' progress (TIE, 2013). The form four students were also included in the study because they were major recipients of the Physics curriculum implementation and were capable of answering questions that were asked by the researcher.

3.5.2 Sample Frame

A sample frame is a list of items from which the sample size of the study is drawn (Best & Khan, 1986). In this study, sample frame composed of 14 Physics teachers and 560 students from five secondary schools making a total of sample frame of 574 participants. A sample is the portion of the population selected for the study (Kothari,

2005). Normally, a sample contains all the major characteristics of the population in order to allow making generalizations about the entire population. The sampling unit constituted the Physics teachers who were the primary actors in curriculum implementation and education policy development and students.

3.5.3 Sample Size

Binde (2010) argues that a small sample size is considered suitable for study with a large and homogeneous population and, thus, should be haphazardly selected. Thus, the actual sample size for the study was 60 participants from the 5 secondary schools composed of 10 Physics teachers and 50 students who were studying Physics. This enabled the researcher to get representatives in every selected school where Physics was taught and learned. Table 3.1 represents characteristics of the sample.

Table 3.1: Number of Respondents From Sample Secondary Schools

Category	No. of the respondents per secondary school					Total (F)	Percent (%)
	School A	School B	School C	School D	School F		
Physics teachers	2	2	2	2	2	**10**	**16.7**
Students who take Physics	10	10	10	10	10	**50**	**83.3**
Total	**12**	**12**	**12**	**12**	**12**	**60**	**100**

Source: Field Data (2016)

3.6 Sampling Procedures

The sampling Procedures are categorized into two, namely: purposive and random sampling techniques to obtain the suitable institutions and clients to be engaged in the study (Cohen *et al.* 2011). In this study, the researcher employed purposive

sampling technique. The word “purposeful” means selecting the participants on the basis of criteria which corresponds to the intention (Binde, 2010). Purposive sampling was used to select the target schools, respondents, and key informants.

In this study, the respondents were considered to be teachers who implement the Physics curriculum in the school and key informant were the students who receive the intended Physics curriculum. In this context, purposive sampling method was used to select the sample secondary schools based on the fact that not all secondary schools had a good pass rate in Physics results in 2012, 2013, 2014 and 2015 on form four national examinations. The only good performing secondary schools in Physics were targeted in this study.

3.6.1 Sampling of Physics Teachers

Physics teachers were selected in order to obtain primary data to address the problem being under investigation because Physics teachers are the ones who implement the Physics curriculum in the class. Therefore, they had a role to ensure that all students understand Physics and performed well in tests and examinations.

Thus, two (2) best Physics teachers teaching in each respective secondary school were selected purposively. They were selected based on their competence and great experience in teaching Physics subject. In total, ten (10) best Physics teachers were involved in this study. These teachers provided valuable information on the poor performance of students in Physics subject in their school as they had an experience in teaching and learning of Physics for more than five years.

3.6.2 Sampling of Five Secondary Schools

The selection of five secondary schools in this study was purposefully done based on the criteria that the schools were ranked in the first four among ordinary level secondary schools in Morogoro Municipality. The high ranked public secondary schools were selected based on the fact that the study would be able to identify differences that exist in the education policy(ies) implication between the old best performing schools in Physics and the new best performing schools in Physics in view of poor Physics performance of students.

The schools were also expected to provide trends of students' performance in Physics for four years consecutively. The schools were identified after analysis of CSEE Physics results of 2012, 2013, 2014 and 2015.

3.6.3 Sampling of Form Four Students

This category of respondents was also purposefully selected. The key focus was to collect information on how students experienced Physics learning and performance. Form four students were to provide primary data on how they learn Physics and resources that needed to improve performance in Physics, and what the government could do to improve Physics performance in secondary schools. Purposive sampling was used to choose students who study Physics because the researcher relied on the fact that, a student with good performance in Physics would have the information required for the study. Table 3.2 hereunder provides the brief picture of the distribution of respondents by sample frame, sample size and sampling method used in this study.

Table 3.2: Distribution of Respondents by Sample Frame, Sample Size, and Sampling Method

Type of Respondent	Sample frame	Sample size	Method used
Best Physics Teachers	14	10	Purposive
Students who take Physics	560	50	Sampling
Total	**574**	**60**	

Source: Research Field Data, 2016

Table 3.2 shows that sixty (60) participants from sampled schools basing on their Physics performance were involved in the study. The sample frame and size had574 and 60 participants respectively. This indicates the sampling method used was purposive sampling.

3.7 Data Collection Methods

This study used questionnaires, focus group discussion, interview guide, observation and document review to collect information on the research problem. These methods elicited information from teachers and students. This study considered that the use of more than one research instrument facilitates obtaining reliable and adequate information (Cohen *et al*., 2010). Thus, the researcher used data collection methods to obtain data from primary and secondary sources.

Primary sources of data are first-hand information collected through questionnaires, interview guide, observation and focus group discussion and are obtained from the original sources (Cohen et al. 2010). In this study, primary data were collected from respondents such as Physics teachers and students who take Physics. Such data were collected through in-depth interview, focus group discussion, observation and questionnaires.

Secondary source of data is second-hand information, which was collected and compiled for other purposes. Such sources include books, performance reports, inventory records and various reports. In this study, secondary data were used to supplement the primary data sources.

3.7.1 Questionnaires

Primary data were collected by using structured questionnaires with both closed and open-ended questions. According to Longman English Dictionary (2010), the questionnaire is a written set of questions, which you give to a large number of people in order to collect information. Questionnaires were used to collect primary data in relation to how gender, interest, educational policy practices, resources and quality of the teachers of Physics subject affected the performance in Physics. The questionnaires for teachers were as shown in Appendix A, for Advanced level students in Appendix B and Appendix C for ordinary level students.

3.7.2 Focus Group Discussion

According to OUT(2012) focus group discussion (FGD) is a discussion conducted by the researcher with a group of respondents who are considered to be representative of the target population. To collect the information about the phenomenon, the purposive sampling methods were employed to get two focus group discussions with 5 to 10 students each. The FGD (see Appendix F) was conducted in order to validate the information obtained from the interview and questionnaires. The advantage of FGD is that it helped the researcher to explore and collect information from respondents' experiences about the research problem in the presence of several respondents.

3.7.3 Observation Guide

A checklist is a list of behaviors, characteristics or other entities that a researcher is looking for (OUT, 2012). In this aspect, the researcher used the checklist (Appendix D) to cross-check the validity of the information obtained from the in-depth interview, focusgroup discussion and questionnaires. This method helped a researcher to collect information about the availability of various teaching and learning resources in relation to performance in Physics subject.

3.7.4 In-depth Interview

According to OUT (2012), in-depth interview is performed on a person-to-person environment and the interviewer can obtain very specific and precise answers. The use of interview technique corresponds to the fact that interviews provide immediate feedback by allowing the interviewer to follow up by asking probing questions, thus obtaining more in-depth data of great clarity. This study also considered that interviews are carried out successfully when literate people are interviewing; it allows direct interaction between individuals giving room for the development as well as maintaining rapport (Cohen *et al.*, 2011). Thus, in-depth interview was applied to Physics teachers using an interview guide (see Appendix E) to collect the information on the education policy(ies) implication on poor Physics performance in secondary school.

3.8 Validity and Reliability of Data

Validity and reliability involve all the measures that are taken to ensure the research results are, to a larger extent, free from subjectivity and biases (Saunders, Lewis, & Thornhill, 2009: 156).

3.8.1 Validity

Validity "is concerned with whether the findings are really about what they appear to be about" (Saunders, Lewis, & Thornhill, 2009: 157). Measures were taken to ensure the validity of the data. In particular, clarifications on some questions were given to the respondents. Again, for ensuring validity of the research instruments of data collection, the constructed instruments were subjected to different experts, including masters' graduates and my supervisor who assessed and approved to insure face and content validity standards. They made commendable modifications to improve the relevance of the instruments to the study questions. Moreover, the use of more than one data sources and data collection instruments ensured the validity of the data collected.

3.8.2 Reliability

Reliability refers to "the extent to which your data collection techniques or analysis procedures will yield to constant findings" (Saunders, Lewis, & Thornhill, 2009). Measures were made to reduce threats to reliability: participant error, participant bias, observer error and observer bias (Saunders, Lewis & Thornhill, 2009: 156 cited in Ngarambe 2014). Before collecting data, the questionnaire was subjected to a pilot test so as to assess the validity of the questions and likely reliability of the data collected. One selected secondary school among the five schools was used for pilot study where two (2) Physics teachers and three (3) students studying Physics subject were involved. After a pilot test, the researcher made some improvements in the research instruments based on the advice and observed challenges faced by respondents during filling or responding to the instrument before real data collection.

3.9 Data Processing and Analysis Procedures

The study collected quantitative and qualitative data from primary sources through questionnaires, interview, focus group discussion and direct observation from the checklist. The data collected were combined together in the analysis. Therefore, both qualitative and quantitative data analysis techniques were employed since this way gave a wider perspective of assessment and also to research questions in a complementary means. In this study, SPSS and Microsoft Excel Programs of data analysis was used to analyze quantitative data where frequencies and percentages were calculated, while content analysis method was used to analyze qualitative data obtained from the focus group discussion (FGD) and in-depth interview.

3.10 Ethical Considerations

The researcher found important to take into account ethical issues in order to avoid misunderstanding with respondents. Therefore, the researcher considered the rules and regulations during the process of preparations, conducting research in the field and reporting of the information collected. In this manner, the following ethical considerations were taken into accounts:

3.10.1 Informed Consent

Informed consent involves the act of making respondents aware of the purpose of the study, the manner in which it could be conducted and the use of the data that would be generated from the study. The heads of schools, teachers of Physics and students were informed about the objectives of the study, the way in which it could be conducted and the significance of the study. Thus, all respondents participated in the study willingly.

3.10.2 Confidentiality

This study ensured that all information collected was kept private, and stored in a safe manner(confidentially) for the purpose of this study only to avoid unauthorized person to access them. Tape audio records, video records, and important documents were strictly protected, and the interview guides as well as questionnaires for each respondent was labeled with identification numbers so as to ensure maximum confidentiality between the researcher who collected information and the respondent who provided information.

3.10.3 Anonymity

To achieve this study, the researcher used the principle of anonymity where the names of the respondents were hidden and given pseudo names. The researcher was very cautious in reporting the findings whereby the schools under study were labeled as school “A”, “B”, “C” “D” and “E”.

CHAPTER FOUR

FINDINGS PRESENTATION, ANALYSIS, AND DISCUSSION

4.1 Introduction

This chapter deals with the presentation, analysis and discussion of findings. This chapter is organized into five major sections which include the introduction, demographic characteristics of the respondents, findings presentation and analysis, discussion,and the summary.

4.2 Demographic Characteristics of the Participants

The data for this study was collected from 60 participants who were the teachers and students from the five secondary schools in Morogoro Municipality. Their demographic characteristics are given hereunder in Table 4.1 in detail.

Table 4.1: Demographic Characteristics of the Participants

Characteristics	Profile	Frequency (F)	Percentage (%)
Gender of the teachers	Males	10	100
	Females	0	0
Teaching experiences of Physics teachers	1-4 years	2	20
	5-8 years	6	60
	9 years and above	2	20
Education level of teachers	Diploma	4	40
	Degree	6	60
Gender of students	Males	25	50
	Females	25	50
Age of students	15-17 years	16	32
	18-20 years	32	64
	21 years and above	2	4

Source: Field Data (2016)

Table 4.1 shows that from the selected schools in Morogoro Municipality there were10 (100%) male teachers who teach Physics in secondary schools, and there is

no (0%) female teachers who teach Physics in secondary schools. Also, the Physics teachers had a different academic qualification, where 4(40%) of the teachers possessed Diploma in education and 6 (60%) have degrees in science and education. The minimum teaching experiences of teachers were between 1 to 4 years, who were 2 (20%) of teachers who participated in the study. Many teachers had experiences between 5to 8 years in teaching, which were 6 (60%) out of all teachers who participated in the study. However, it is shown that 2 (20%) teachers had teaching experiences of 9 years and above.

The results imply that all the teachers had adequate experiences and skills to teach Physics in secondary schools. Moreover, the results show that there is a need to encourage females to study Physics subjects since there were no (00%) female teachers who teach Physics. This means that females are left behind by males in studying Physics as their priority, and the implication is that the education and training policy has to stress on encouraging females to study Physics so as to increase the number of Physics teachers in secondary schools.

On the other side, Table 4.1 above shows the characteristics of the students who were involved in the study. A total of 50 students consisted of 25 females which is equivalent to 50% of the respondents and 25 males which is equivalent to 50% of the respondents responded to the questionnaires and focus group discussion about the problem of poor performance in Physics in secondary schools. The researcher tried to balance, the gender of the students so as to collect unbiased information in relation to Physics performance.

The findings show that out of 50 students who were the respondents in this study, 16 (32%) were between the age group 15 and 17 years, 32 (64%) students were between the age group of 18 and 20 years, and 2 (4%)had 21 years and above. This shows that the age difference of the students in secondary school has no significant impact on the poor performance of students in Physics because 16 students responded in this study were between 15 and 17 years. This implies that the education and training policy(ies) provide an opportunity to all students to learn Physics in secondary school.

4.3 Findings Presentation, Analysis and Discussion

This study aimed at assessing the education policy(ies) implication on students' poor performance in Physics subject in secondary schools. The findings are presented on the basis of the research questions. The findings are presented in frequencies (F) using tables and followed by the detailed analysis of the results in the next sub-sections.

4.3.1 Policy(ies) Relation Reflection on Students' Poor Performance in Physics

This section discusses data relating to the policy(ies) reflection on students' performance in Physics at ordinary level secondary schools. More specifically, the section provides answers to the first research question: *"What are policy(ies) relation on the students'poor performance in Physics subject?"* To achieve this question, questionnaires, in-depth interview, focus group discussion and review of documents were used to obtain information. Results are presented as shown in Table 4.2.

Table 4.2: Policy(ies) Relation On Students' Poor Performance in Physics

Poor performance in Physics	Responses			
	Yes (F)	Yes (%)	No (F)	No (%)
Lack of Physics laboratories	55	91.7	5	8.3
Lack of laboratory equipment	45	75	15	25
Lack of relevancy of contents taught	48	80	12	20
How to use laboratory equipment	40	66.7	20	33.3
Lack of in-service training	44	73.3	16	26.7

Source: Field data (2016)

Table 4.2 shows the policy(ies) reflection on the low performance of Physics subject in secondary schools. The results show that 55 (91.7%) respondents accepted that lack of the Physics laboratories as the factor for low performance in Physics while 5 (8.3%) respondents did not agree. On the other side, 45 (75%) respondents agreed that the lack of laboratory equipment is among the reasons for low performance while the remaining 15 (25%) of the respondents found this factor of less significance. Moreover, 48(80%) of the respondents accept that there is miss relevancy of contents taught as the source for low performance in Physics and 12 (20%) did not agree with this factor. Also, 40 (66.7%) of the respondents indicated that how to use laboratory equipment has to be reflected in the policy while the other 20 (33.3%) did not agree. Lastly, 44 (73.3%) of the respondents agreed that lack of in-service training and 16 (26.7%) did not agree with this factor. The findings are presented and discussed in details hereunder.

Lack of Physics Laboratories

Table 4.2 shows that all 55 (91.7%) of the respondents agreed that the poor performance of students in Physics subjects is caused by the lack of Physics

laboratories in most of the schools. Both teacher and student agreed that if schools would have Physics laboratories it would be easy for the teachers to put theories into practice and poor performance in Physics would be reduced. In more analysis during the interview, one of the respondents said,

> *…"there are many secondary schools lack Physics laboratories. For me, I think the policy(ies) should reflect on this challenge to avoid poor performance in Physics". (Field data, Interview: September 2016).*

The findings show that policy should reflect on the best ways of teaching Physics by the construction of Physics laboratories in every school so as to have conducive learning environments and reduce poor Physics performance in secondary schools. The findings concur with the ETP (2007, 2010) which stressed on the construction of laboratories to boost science learning in secondary schools. Thus the policy(ies) should consider the lack of laboratories as the contributing factor for low performance in Physics subject in secondary schools.

Lack of Laboratory Equipment

From Table 4.2 data show that 45 (75%) of the respondents agreed that lack of laboratory equipment lead to low Physics performance in secondary school while 15 (25%) of the respondents did not agree with this factor. This shows that policy(ies) has to reflect on the adequacy of laboratory equipment in order to improve the teaching and learning of Physics in order to avoid low performance. Also during the interview, one of the respondents affirmed that:

> *"..have laboratories but no equipment in the laboratories which could help teachers to teach practical Physics…this should be taken seriously as a contributing factor to low performance in Physics…and I think policy(ies) have to reflect on this factor". (Field data, Interview: September 2016)*

The findings show that even though laboratories may be available, but still laboratories are not equipped with Physics teaching and learning facilities. The findings were in line with the study by George (2000) who reported that laboratories should be equipped with the materials for smooth learning of practical. Thus, policy should reflect on availability and adequacy of laboratory facilities to get out of low Physics performance.

Physics Lack Relevancy of its Contents Taught

Findings from Table 4.2 show that 48 (80%) of the teachers believed that miss relevancy of contents taught in Physics lead to low Physics performance in secondary schools. On the other side, 12 (20%) respondents didn't find missing relevancy as the big deal in low performance of students in Physics. One of the respondent through interview had this to say;

> *"My experience shows that some of the teachers do not link the laws and principles of Physics with real life practice…thus students get difficult to link the concepts…thus they miss relevancy of the content taught between theory and practice…what the students learn cannot apply in life".* (Interview, Interview: September 2016).

The quotation shows that students need to be taught the relevant content. The analysis shows that there is an evidence that if students fail to understand and apply the content taught in Physics, they become bored and dislike the subjects. This was also reported in the study by Joseph (2014). Thus, both teachers and students want Physics to reflect exactly on their daily living experiences. This implies that the policy should stress much on teaching Physics through real living experiences whereby students can make connections between the subject content and their daily living experiences. Thus, the contents should be linked with students' daily lives and directly engage students in practice as ESR stressed.

How to Use Laboratory Equipment

Table 4.2 shows that 40 (66.7%) of both teachers and students agreed that skills on the use of laboratory equipment as a factor. On the other side, 20 (33.3%) of both teachers and students did not agree. The analysis shows that most of both teachers and students agreed that the teacher who lacks skills and knowledge on the effective and efficient use of laboratory equipment lowers the performance in Physics subject. The same reflection was found during the interview when one of the respondents affirmed that;

> *"…in our school, we don't have laboratory technicians who could help us how to use equipment in the laboratory…some of us passed through bridging course and we were not well taught in the college… we need more training on using Physics equipment*". (Field Data, Interview: September 2016)

The statement above shows the need for the training about the use of laboratory equipment. The findings concur with the studies by Soyibo (1987) and Onah & Oguru (2010) who reported that policy(ies) should stress on teachers' knowledge and skills of using laboratory equipment. This shows that there might be misuses of equipment in the teaching and learning of Physics. Therefore, this study reveals that there still a need for the policy to put more emphasis on the proper use of laboratory equipment in order to enable both teachers and students to use the equipment effectively in the teaching and learning process so as to avoid poor performance in Physics subject.

Lack of In-service Training

Table 4.2 shows that 44 (73.3%) of both teachers and students agreed that lack of in-service training to teachers contributes in the low performance in Physics subject. On

the other side, 16 (26.7%) of both teachers and students did not agree with this factor. The analysis shows that most of both teachers and students agreed that the teachers who lack regular in-service training to update their skills and knowledge on various Physics contents fail to be effective and efficient in the use of laboratory equipment and support learners to perform well in doing practically. In the interview, one among the respondents said that:

> *"The policy(ies) is not clear about when the teacher is supposed to attend for in-service training…this makes teachers to be outdated with new pedagogical and practical skills in Physics. I think the policy should stress that every Physics teacher has to attend twice per year in training to gain more knowledge and skills in order to teach effectively. This is the policy challenge on low performance because teachers are not given in-service training"*(Fied data, Interview: September 2016).

The finding implies that there is a need for a regular in-service training for teachers of Physics. Thus, the policy(ies) could make follow up if teachers are given training or not. The findings went in line with the studies by Nkuba (2012) and Musasia (2016) who reported that in-service training for Physics teachers improves Physics teacher pedagogical and practical skills. Therefore, the policy could follow on the proper way of doing in-service training for teachers so as to improve their teaching abilities in Physics to avoid poor performance.

Discussion of the Findings

Section 4.2.1 sought to answer the first research question which asked: *"How policy(ies) do reflect the students' performance in Physics subject?"*The question wanted to find out issues related to policy reflection in education, particularly in Physics performance. This study revealed the following findings under this section which was somehow similar to various studies (Speering & Rennie 1996; Lyon

2005; Magembe 2008: Nkuba 2012; Onah & Oguru 2010; Musasia 2016).The findings related to policy(ies) relation on poor performance in Physics were expressed in five areas and presented in the table using frequencies and percentage as follows: lack of Physics laboratories; lack of laboratory equipment; miss-relevancy of contents, how to use laboratory equipment, and lack of regular in-service training. Therefore, this study sets the following;

Firstly, it was revealed that respondents agreed that lack of Physics laboratories contributes to low performance in Physics subjects. Both teachers and students said that Physics is easily learned through doing various practice in the laboratories. The schools which lack Physics laboratories hinder the effective learning of Physics by doing which motivate students to work hard (George, 2010). Thus, the education and training policy(ies) determine the availability of Physics laboratory and contribute to the solutions on the availability of Physics laboratory in every school so as to teach Physics by doing in the laboratories and improve performance.

Secondly, it was exposed that there is a relationship between education policy and lack of laboratory equipment. According to ETP (1995, 1999, 2007 and 2010), laboratory equipment is important in teaching and learning of science. Other studies reported that it is difficult to improve performance in Physics without equipment, especially for making students' experiences the concepts in real environments (Onah & Oguru, 2010). Education policy should improve availability of adequate laboratory equipment. Improving availability of laboratory equipment will enhance learning and teaching in Physics.

Lastly, there is a need to provide in-service training to Physics teachers, teachers to teach relevant Physics contents bylinking to daily life practice, and teaching of Physics teachers especially junior teachers how to use laboratory equipment. Thus, education and training policy could focus on how poor performance can be avoided through eliminating those challenging factors and hence improve performance.

Concluding Remark

With regard to the findings above, it shows that policy(ies) relates with major five areas so as to improve Physics performance in secondary schools. The major education and training policy(ies) relation on poor performance in Physics subject includes lack of Physics laboratories, lack of laboratory equipment, miss relevancy contents, how to use laboratory equipment and lack of in-service training. This study has revealed that the mentioned factors have a close relationship with education policies and performance in Physics.

4.3.2 Policy(ies) Relation on Availability of Physics Teaching and Learning Resources

This section presents and discusses data relating to the policy(ies)relation on the availability of Physics teaching and learning resources. The research question was, *"What are the education and training policy(ies) relation on practice on the availability of Physics teaching and learning resources?"* To achieve this question, questionnaires, focus group discussion and review of documents were used to obtain information. Results are presented as shown in Table 4.3.

Table 4.3: Availability of Physics Teaching and Learning Resources

Availability of Physics teaching and learning resources	Yes (F)	Yes (%)	No(F)	No (%)
Physics laboratories	60	100	0	0
Laboratory equipment and materials	48	80	12	20

Source: Field data (2016)

Table 4.3 indicates that the availability of teaching and learning resources are crucially important on policy(ies) implication for avoiding poor performance in Physics subject. For example, 60 (100%) of the respondents expressed that the policy should reflect the availability of Physics laboratories. Else, 48 (80%) of the respondents expressed that issue of laboratory equipment and materials should be given priority while teaching and learning of Physics in secondary schools. The findings show that as far as policy(ies) concerned, laboratories and equipment are essential for avoiding low performance in Physics. The findings are here presented and discussed in details.

Physics laboratories

Table 4.3 shows that 60 (100%) of the respondents believe that availability of Physics laboratory is vital for teaching and learning of Physics in secondary schools. The analysis of document review showed that schools with Physics laboratories had a better performance in Physics compared to the schools which had no laboratories of Physics. The same information obtained through the focus group discussion, this assertion was made;

> *"The powerful resource to be stressed in the policy is the availability of Physics laboratory. We all know that learning and teaching of Physics go together with practicals which should be done in the laboratory. Although policy(ies) insists on the presence of laboratories yet many*

> *schools do not have, and the present laboratories cannot accommodate all students. There is a need to construct big Physics labs"* (Field data, FGD: September 2016).

The results show that there is a need for policy(ies) to ensure the availability of Physics laboratory in every secondary schools. The respondents had anopinion that the availability of laboratories is an important policy resource for teaching and learning of Physics. Though policy(ies) (ETP, 2010 & ETP, 2014) placed the concern in the construction of laboratories to boost science teaching and learning, yet the policy effort is required to ensure that laboratories are available in all secondary schools to enhance teaching and learning of Physics. The findings correspond with the study of Nguru (2010) on analysis of practical work and performance in Physics in Kilolo, Iringa. His study found that building of laboratory and supply of equipment is the policy concern and has to be implemented in all secondary schools to smooth teaching and learning of Physics and improve performance. Thus, this study find that education policy(ies) should accomplish its ambition on the construction of Physics laboratories in all schools to enhance practical Physics to be done.

Laboratory Equipment and Materials

Table 4.3 above shows that 48 (80%) of the respondents believed that policies should ensure the availability of Laboratory equipment and materials. On the other side, 12 (20%) of the respondents did not accept this factor as an important policy reflection on the availability of teaching and learning resources. In the focus group discussion, this excerpt was made:

> *"The policy(ies) should take into account the availability of equipment in the laboratories and other materials like books, practical manuals,*

> *chemicals and other infrastructures that facilitate teaching and learning of Physics. In many schools, equipment of Physics are not good like meter bridge, vernier calipers, galvanometers, and others…we insist the materials should be supplied for effective teaching and learning"* (Field data, FGD: September 2016).

The findings show that there is a need for a policy to stress on a continuous supply of the equipment and materials in the secondary schools to enable teaching and learning. Since the education and training policy(ies) insist on the availability of Physics teaching and learning resources, yet the availability of resources in many schools is not good.

The findings are in line with the study by Kihwele (2014) on students perceptions of science subject at Ifakara secondary school. His study exposed that science laboratories lacked equipment and resources, which could simplify teaching and learning of concepts of science and allow students to do practically. Thus, there is a need for a policy(ies) to ensure that resources are available in every school.

Discussion of the Findings

Section 4.3.2 sought to answer the second research question which asked: *""What is the education policy(ies) practice on the availability of Physics teaching and learning resources?"*The question wanted to find out issues related to policy(ies) practice in Physics. The findings were similar to my expectations and also as some previous studies (Joseph 2014; Nguru 2010; Kihwele 2014; and George 2000). The findings related to policy(ies) relation on the availability of Physics teaching and learning resources revealed that Physics laboratories 60 (100%); and Laboratory equipment and materials 48 (80%). Presence of Physics laboratory and presence of

laboratory equipment as found in this study have the significant impact on teaching and learning of the Physics subject. Therefore, this study sets the following;

Firstly, teachers and students pointed out that Physics laboratories are the first resource which the policy(ies) should reflect and take it into practice. The respondents argued that the policy(ies) should state that every secondary school should construct the Physics laboratory as stipulated in the ETP of 2007 and ETP of 2014. This implies that policy(ies) insist on learning Physics through practical, however, there is a need for the policy to insist on each school to possess Physics laboratory as an important resource in teaching and learning of Physics as it has a close relationship with improvement of students' performance in Physics subject.

Secondly, since 48 (80%) of the respondents find the availability of laboratory equipment as an important resource to be taken into policy(ies) practice, then there is a need for the policy(ies) to put more emphasis on the issue of laboratory equipment and materials. The findings show that if many resources like equipment will be available in secondary school, then the low performance of students in Physics will be reduced. Thus, it is important for policy to insist on the availability of the Physics laboratories and laboratory equipment as the key resources on the teaching and learning of Physics in secondary schools.

Concluding Remark

From the above discussion of the findings, it is concluded that policy(ies) relation on the availability of teaching and learning resources relates to the availability of Physics laboratories (100%) and the availability of the laboratory equipment and

materials (80%). If the mentioned resources would be available in every school, then teachers would teach Physics effectively and Physics performance would be improved in secondary schools, ultimately the education and training policy(ies) could bring the required effect.

4.3.3 Policy Challenges on the Availability of Quality Physics Teachers

This section presents and discusses data relating to the policy challenges of the availability of the quality of the Physics teachers. The research question was, *"What is the policy(ies) relation on the availability of quality Physics teachers?"* To achieve this question, questionnaires, interview, focus group discussion and review of documents were used to obtain information. Results are presented as shown in Table 4.4.

Table 4.4: Policy Relation on the Availability of Quality Physics teachers

Quality of Physics teacher	Yes (F)	Yes (%)	No(F)	No (%)
How Physics teachers are prepared	54	90	6	10
Qualification of the Physics teachers	49	81.7	11	18.3
Kind of knowledge, skills, and values	39	65	21	35
Ability to merge theory and practice	52	86.7	8	13.3
Competence in practical	56	93.3	4	6.7

Source: Field data (2016)

Table 4.4 shows the education policy(ies)related to the availability of the quality Physics teacher. The quality of the Physics teacher is important in improving the performance of the students in Physics because it is argued from studies that the

efficiency and effectiveness of the student depends on the quality of the teacher (PSA 2005; Bakahwemama 2009). Education policy(ies) relation on the availability of quality Physics teachers include: How Physics teachers are prepared 54 (90%); Qualification of the Physics teacher 49 (81.7), Kind of knowledge, skills and values 39 (65%); Ability to merge theory and practice 52(86.7%); and Competence in practical 56 (93.3%). The results of the findings are hereby presented and discussed in details.

How Physics Teachers are Prepared

Table 4.4 above shows that 54 (90%)of respondents accepted that how Physics teachers are prepared as the policy(ies) relation, influence the quality of the Physics teacher, while the other 6 (10%) did not agree with this factor. The analysis show that in many cases the poor preparation of the teachers in teacher training colleges leads to the inadequacy of qualified Physics teachers in secondary schools. Although the policies (1995, 2010, 2014) set out the importance of preparing the competent teachers of science through various mechanisms, but in teacher colleges there had been reported the shortage of science tutors, and therefore it happens that student teachers are not well prepared at teacher colleges. This implies that policy(ies) should focus and address quality in the preparation of the Physics teachers at teacher colleges.

Qualification of the Physics Teacher

Table 4.4 shows that 49 (81.7%) of both teachers and students agreed that the qualification of the Physics teacher is a challenge for the availability of quality

Physics teachers. On the other side, 11 (28.3%) of both teachers and students did not agree. The analysis shows that most of both teachers and students agreed that the teachers with higher qualifications have greater skills and knowledge to teach Physics and have higher quality than those who possess low qualifications. This findings were in line with the study by Munene (2014) and report by PSA (2005) where together reported that teachers with high qualifications teach well and influence students to perform higher in Physics.

The analysis further disclosed that in order to improve the quality of the Physics performance in secondary schools, the policy(ies) should consider the employment of the teachers who possess the bachelor's degree first as it was disclosed also through focus group discussion, this teacher asserted that;

> *"The way we see the policy challenge has to pin on the qualifications of the science teachers…really if we need a Physics teacher of the required quality, the government should insist on having the Physics teachers who possess a bachelor and master's degree in science…they know the content and practical. There will be no longer a failure in Physics again"* (Field data, FGD: September 2016).

The findings imply that the policy(ies) should consider and make a close follow-up on the qualification of the teachers who teach Physics in secondary schools. The assertion above means that the quality of the Physics teacher comes from the qualification of which he or she possesses.

Kind of Knowledge, Skills, and Values

Table 4.4 shows that 39 (65%) of the respondents believed that the kind of teacher knowledge, skills and values are the quality of the Physics teacher. On the other side, 21 (35%) of the respondents did not accept this factor as a challenge to the quality of

the Physics teacher. The analysis shows that the quality of the Physics teacher is either increased or decreased with the knowledge, skills, and values. For example, one of the teachers said during the focus group discussion that;

> *"The policy has difficulties on how to identify and recognize teachers with the relevant kind of Physics knowledge, skills, and values. Most of the Physics teachers discourage students that Physics is difficult…this is either the teachers are not having adequate knowledge and skills about the content. Thus, the policy should address that teachers who teach Physics should really have Physics knowledge, skills and values"*(Field data, FGD: September 2016).

The results show that there is a need to stress on the issue of professionalism. The respondents had an opinion that the availability of quality Physics teachers has to look at what teachers possess in term of knowledge, skills, and value because these show that there is a challenge on these issues for quality teachers of Physics.

Ability to Merge Theory and Practice

Table 4.4 above shows that 52 (86.7%) of the respondents believed that the policy(ies) on the quality of Physics teachers is related to the ability of the teachers to merge theories, principles, and practice. On the other side, 8 (23.3%) of the respondents did not agree with this factor as a challenge on the quality of the Physics teachers. This implies that the policy focus has to address the link between the Physics theories, principles and practice. This was also revealed during focus group discussion when one of the respondents said:

> *"It is a policy challenge that Physics teachers rely on calculation, they just put the data, and principle and solve the questions. Moreover, teachers do not merge theories and real life practice which makes students difficult to comprehend the concepts. The policy challenge can be how to identify teachers who can link the assumptions, theories, principles and practice"* (Field data, FGD: September 2016).

The quotation above indicates that the need for the availability of quality Physics teachers is one among the policy(ies) challenge. The policy(ies) should take into consideration the ability of the teachers to link both the theories and practice in Physics. What the teachers teach should reflect the students' daily lives.

Competence in Practical

Table 4.4 shows that 56 (93.3%) of the respondents agreed that competence in practical is an important quality of Physics teachers. On the other side 4 (6.7%) did not agree with this policy challenge on the quality of the available Physics teachers. The findings show that there is a need for the schools to hire teachers who are competent in conducting Physics practical. On the other side, through focus group discussion one of the respondents said that;

> *"I could advise that Physics teachers should be equipped with practical competencies. We have experienced that many teachers fail to conduct Physics practical…we need to improve performance in Physics and the policy(ies) has challenges on addressing the issue of teachers' competence in conducting practical, regardless their ability in theory part"*(Field data, FGD: September 2016).

The results show that Physics teachers need to have the ability in preparing, and conducting of Physics practical. This implies that policy(ies) needs to address the issues that would improve the teachers' competence in Physics practical in order to obtain quality Physics teachers. This findings were in line with the study by Mabula (2014) who found that Physics teachers should be competent both in theoretical skills and practical skills acquired from high qualification. It is revealed that the competence of the teacher in practice has the relationship with Physics performance in secondary schools.

Discussion of the Findings

Section 4.3.3 examined the education and training policy(ies) relation challenges on the quality of the Physics teachers. This question was important because there was an argument in the policy on the quality of the Physics teacher as one of the factors, which contribute to low student performance in Physics in secondary schools. The findings disclosed that the quality of Physics teacher is affected by the number of issues in policies, namely; how Physics teachers are prepared 54 (90%); qualification of the Physics teacher 49 (81.67), kind of knowledge, skills and values 39 (65%); ability to merge theory and practice 52 (86.67%); and Competence in practical 56 (93.33%). The findings correspond with the statements in education policies of 1995, 1999, and 2007 together with studies by (Mabula 2012; PSA 2015; and Musasia 2016) which respectively insist on the qualification of the science teachers and improve the quality of the teachers at different levels. Therefore, the study sets out the following:

The findings revealed that the policy priority on how Physics teachers are prepared from teacher colleges and universities has a close relationship with the availability of quality teachers. Some other studies (Thomas and Brain 2006) reported that best teacher comes from how good he was being prepared for the teacher training college with good subject content and pedagogical content. Thus, availability of quality Physics teacher depends on how colleges prepare Physics teachers, both in theory and practice.

Moreover, this study has disclosed that the qualification of the Physics teacher has a relation with policy(ies) on the availability of quality Physics teachers. ETP (1995)

states that the secondary school teacher should have at least a level of a bachelor degree. The challenge is that a little number of students opt Physics at University and there are many schools, which need Physics teachers (Mabula, 2014). Thus, the policy either should stress on the graduates from University to teach Physics both in ordinary level and advanced level secondary schools. Using teachers of high qualification would improve Physics performance in secondary school (PSA, 2005). This implies that it is the responsibility of education policies to consider the availability of Physics teachers of high qualification for the purpose of improving performance in secondary schools.

The kind of knowledge, skills, and values teachers have is the challenge for the availability of the quality Physics teachers. The teacher who lacks relevant knowledge, skills and value of Physics cannot be effective and efficient in teaching the subject (Nyamba & Mwanjombe, 2012). The policy(ies) challenge is what knowledge, skills, and value should be possessed by the Physics teacher. Thomas and Brain (2006) argue that the quality teachers are knowledgeable, skillful, and have a positive attitude toward the subject. Thus, the policy challenge is how to obtain Physics teachers who are knowledgeable, skillful and have positive attitudes.

This study revealed that the ability to merge theory and practice is another quality of the Physics teacher. The real Physics teacher is the one who can teach theory, make a demonstration and guide students to reflect and put into practice by linking with daily life experience (Rivard and Straw, 2000). The big policy challenge on the quality of the Physics teacher is to obtain teachers who are competent to teach both theory and practice. Ojedirani et al (2014) reported that some of the Physics teachers

cannot merge theory and practice and lead to poor performance of students in Physics. The challenge here for policy is how to improve teachers' competence in theory and practice.

Lastly, the findings showed that competence in practical is one among the quality of the Physics teacher. It was disclosed that teachers who teach Physics in secondary school have inadequate knowledge and skills on how to prepare Physics practical and therefore they ignore to teach practical. According to education policy(ies) of (1995, 2010, 2014), it is emphasized that the students who take science to do practically. Moreover, ESR insists on education by doing. Thus the quality teacher is the one who can work with practical in Physics. This implies that the policy(ies) should consider the availability of the teachers who can manage to prepare the practical. Therefore, the policy should address how to make Physics teachers competent in the use of laboratory equipment so as to maintain the quality of the Physics teachers.

Generally, policies should put more emphases on addressing factors which affect the quality of Physics teachers. Therefore, consideration on how teachers are prepared, qualification of the Physics teachers, a kind of knowledge, skills, and values of the Physics teachers, ability to merge theory and practice and competence in practical were found to be an educational policy in relation to the availability of quality of the Physics teachers.

Concluding Remark

The purpose of this section was to explore the education policy(ies) challenge relation on the quality of Physics teacher. The findings were organized into five areas

as mentioned by the respondents, namely, how Physics teachers are prepared, qualification of the Physics teacher, kind of knowledge, skills, and values, ability to merge theory and practice, and competence in practical. All these challenges imply that education policy(ies) should create room to address them honestly so that the stakeholders could understand them and give support for the availability of the quality Physics teachers.

4.3.4 Policy Relation Challenges on Effective and Efficient Teaching and Learning of Physics Subject

This section presents data and discusses findings relating to the policy challenges of effective and efficient teaching and learning of Physics. The research question was,

> *"What are policy related challenges of effective and efficient teaching and learning of Physics?"*

To achieve this question, questionnaires, focus group discussion and review of documents were used to obtain information. Results are presented as shown in Table 4.5.

Table 4.5: Policy Challenges on Effective and Efficient Teaching of Physics

Effective and efficient teaching of Physics	Yes(F)	Yes(%)	No(F)	No (%)
Financial support	48	80	12	20
Attitude of teachers and students	49	81.7	11	18.3
Teaching and learning resources	52	86.7	8	13.3
Equipped laboratories	41	68.3	19	31.7
Laboratory technicians	54	90	6	10

Source: Field Data (2016)

Table 4.5 shows the policy challenges of effective and efficient teaching of Physics in secondary schools. It consists of financial constraints 48(80%), attitude of teachers and students 49(81.7%), teaching and learning resources 52(86.7%), laboratories 41(68.3%), and laboratory technicians 54(90%). The results show that the effective and efficient teaching of Physics in secondary schools depends on the number of issues that challenge the policy in place. The findings are hereunder presented and discussed in details.

Financial Support

Table 4.5 shows that 48(80%) of the respondents agreed that the financial support is important for ensuring efficiency and effectiveness in the teaching of Physics. On the other side, 12(20%) did not find this factor as important. This implies that the policy has to focus on the availability of finance to the schools in order to enable schools to construct infrastructures, purchase facilities, and motivate Physics teachers. In the further analysis of the interview, one among the respondent affirmed that:

> *"Science needs the favorable infrastructure to enable teachers to teach effectively and efficiently. Thus the need of financial support to make* the *environment conducive for effective teaching and learning is crucially important. We need money to motivate teachers and students who are doing well, purchase materials and other resources. This shows how important financial support should be addressed to the policy(ies)"* (Field data. Interview: September 2016).

The quotation above insists on the importance of policy to insist on the need of financial support as the factor for the effective and efficient teaching of Physics. The finding resemble with the study by Nkuba (2012) who reported that financial support helps schools to purchase tools and resources required in Physics practical. This informs that, if schools are supplied with the fund as stated in the policy(ies) there is

a possibility to improve environments and facilities for effective and efficient teaching and learning of Physics.

Attitude of Teachers and Students

Table 4.5 shows that 49 (81.7%) of the respondents agreed that the attitudes of the teachers and students are important in the effective and efficient teaching of Physics. On another side, 11 (18.3%) of the respondents disagreed on this factor. The results imply that teachers may teach effectively and efficiently when they have a positive attitude toward the subject. Results show that the issue of the attitude of the teacher and the student toward Physics is a challenge in policy(ies) and once addressed, it would lead to the effective and efficient teaching of Physics. Moreover, during the interview one of the respondents made this assertion that:

> *"I want to make clear that effective and efficient teaching of Physics requires the positive attitude of the teachers and students toward Physics…negative attitude hinder effective teaching…policy should promote good attitude*s *to both teachers and students".* (Field data, Interview: September 2016).

The findings above show the importance of addressing the attitude of the Physics teachers on Physics teaching and learning. This implies that if the teachers who teach Physics had a positive attitude even his/her students would have positive attitude, which would help them learn Physics subject effectively. The findings correspond with the study by Kihwele (2014) who reported that the attitude of the teacher and students is the factor for the effective and efficient teaching of Physics. Therefore, it is vital for policy to take this as a challenge in the effective and efficient teaching of Physics in secondary school, which needs to be addressed.

Teaching and Learning Resources

The issue of teaching and learning resources exposed to be another challenge for the effective and efficient teaching of Physics. For example, Table 4.5 shows that 52 (86.7%) of the respondents agreed that policy should give the address the adequacy of resources in all schools. On the other side, 8 (13.3%) of the respondents did not agree with this factor. Those who pointed out the teaching and learning resources had felt that their teaching cannot be effective and efficient if the teachers lack resources to prepare their lessons. It was also insisted during an interview as one among the respondent said that:

> *"As a teacher, I know the effective and efficient teaching of Physics requires enough teaching and learning resources. Both teachers and students require books, chemicals, tools, and other facilities that facilitate teaching and learning including ICT facilities. Huge teaching and learning resources simplify preparations of the content and Physics practical"* (Field data, Interview: September 2016).

The findings above show that policies have to be conscious of teaching and learning resources. The findings were in line with various policy documents for example (ETP 2010; ETP 2014). Moreover, the findings correspond with the study by Munene (2014), which insisted on the provision of teaching and learning resources of Physics subject in secondary schools. Therefore, the need for schools to have adequate Physics teaching and learning materials such as reference books, practical manuals, laboratory tools and chemicals. It is realized that resources require special follow-up in all secondary schools for the effective and efficient teaching of Physics.

Equipped Laboratories

Well-equipped laboratories increase the effectiveness and efficiency of the Physics teachers in teaching the subject in secondary schools. Table 4.5 shows that

41(68.3%) of the respondents agreed that well-equipped laboratory is the policy challenge for the effective and efficient teaching of Physics. On the other side, 19(31.7%) of the respondents found this as less important. This shows that if every school is provided with well-equipped facilities in the Physics laboratories, there will be effectiveness and efficiency in the teaching and learning process of Physics subject. Therefore, policy should put more emphasis on the availability of facilities in Physics laboratories, and whatever is needed for teaching and learning is available in time and space. On the other side, one of the respondents from interview said that:

> *"We cannot teach Physics without practical, and this is where each school should have the laboratories which are equipped with facilities for doing practically. Physics labs help students and teachers to interact effectively during a demonstration of the practical and expose students in real life situation about what they learn and thus easy to remember and develop an interest in Physics".* (Field data, Interview: September 2016).

The findings above insist on the availability of the teaching and learning resources for the effective and efficient teaching of Physics. The findings are similar to the study by Nguru (2010) on the analysis of practical work and performance in Physics at OLSS in Iringa. His study reported that, the government should implement education policy(ies) on the construction of Physics laboratories and supply of equipment to enable students in secondary school to learn practically. Thus, having well-equipped laboratories is the concerned about the policy for effective and efficient teaching of Physics as an important resource.

Laboratory Technicians

Table 4.5 shows that 54 (90%) of the respondents agreed that laboratory technicians are crucially important for the effective and efficient teaching of Physics. The issue

of laboratory technicians was probably the policy challenge compared to others. Only 6 (10%) did not find this as the challenge for the effective and efficient teaching of Physics. The findings imply that if each school would be given a qualified laboratory technician, then the practical sessions would be well taught and each facility required for Physics learning would be well prepared. In this case, the policy is challenged to ensure that laboratory technicians are available in all schools to ensure effective running of the practical sessions. Laboratory technicians act as the assistant to the Physics teacher and therefore by working together, Physics can be effectively and efficiently taught in secondary schools.

Discussion of the Findings

Section 4.2.4 discusses findings in relation to the research question which asked:

> *"What are policy challenges on effective and efficient teaching and learning of Physics?"*

This question was important because students have poor performance in Physics, therefore there was a need to be familiar with policy challenges on the effective and efficient teaching of Physics in secondary schools. To do so, the findings were in line with various literature on policy challenges in science teaching and learning (Sebuyi, 2012; Kohler and Mishra, 2008; Nguru 2010; Munene 2014). For the effective and efficient teaching and learning of Physics in secondary schools this study sets the following:

Firstly, financial support to the schools is important to enable them to purchase resources and motivate Physics teachers. It is difficult to conduct practical if schools

have no fund for that (Nguru, 2010). Also, because Physics teachers spend much time preparing practical, there is a need for the policy to allocate fund for Physics teachers in order to motivate them for spending much time in preparations for teaching. Thus, for the effective and efficient teaching of Physics fund should be allocated to ensure that all planned requirements are met in Physics.

Secondly, the study has revealed that the attitude of the teachers and students is the challenge of effective teaching and learning of Physics. It was disclosed that Physics teachers are mindless and do not consider the slow learners, and sometimes they are boastful (Kihwele, 2014). In one way or another weak student afraid of taking Physics in secondary schools. The attitude of the teachers and students affect the effectiveness and efficiency teaching of Physics (Nyamba and Mwanjombe, 2012; Anwer, Iqbal and Harrison 2012). Thus, the policy challenge here is to address the issue of the attitude of the Physics teachers. Policies should consider that the Physics teacher should be good listeners, encourager, promotor, and counselor to students in order to build confidence in the student to learn Physics subject.

Thirdly, teaching and learning resources influence the effective and efficient teaching of Physics. The policy challenge is to deal with the availability of resources in secondary schools including; books, practical manuals, chemicals, tools, and materials. Studies have shown that, for effective teaching and learning of Physics subject, all resources should be available (Onah and Oguru, 2010; Mabula, 2012). Thus, education policy(ies) should manage to address the issue of resources. It was found that Physics textbooks and reference books are very few and students are

many, teachers are also few or none. Therefore, the policy(ies) should take this as the challenge for the effective and efficient teaching of Physics subject.

Fourthly, equipped laboratories with facilities were found important on this study as the policy challenge for the effective and efficient teaching of Physics. Few secondary schools have well equipped laboratories, but majority are not. Equipped laboratories enhance Physics teaching, especially during practical of Physics (Msoka, 2015). Practical learning means, doing what students learn in the laboratory and help student uses the five senses of organs. Thus, the challenge here is how the school can manage to equip laboratories with apparatus. For effective learning (Nyandwi, 2014) argues that students should be exposed to the actual practice of the given content and task, which needs equipment and tools for Physics teaching and learning.

Lastly, this study has revealed that for effective teaching and learning of Physics in secondary school, the schools need to have laboratory technicians. Lack of laboratory technician was another factor which challenges the quality of the Physics teachers. 100% of the teachers mentioned that they get problems in the preparation of practical sessions due to lack of assistance from laboratory technicians. This study revealed that only 20% of the schools had a laboratory, but 10% of secondary schools had laboratory technicians and others had not. Laboratory technicians are important, especially in the preparations of the practical of Physics. Being alone, the Physics teacher can not prepare effective and efficient Physicspractical sessions.

Thus, for effective teaching and learning of Physics in secondary schools, the policies should focus on the challenge such as financial support, the attitudes of the

teachers and students, teaching and learning resources, equipped laboratories, and the availability of laboratory technicians.

Concluding Remarks

The purpose of this section was to explore the education and training policy*in relation totheeffective and efficient teaching and learning of Physics subject in Morogoro Municipality*. To achieve the objective, the researcher conducted the questionnaires, interview, and review of documents. The findings clearly showed five education and training policy(ies) challenges which are; financial support, the attitudes of the teachers and students, teaching and learning resources, equipped laboratories, and the presence of laboratory technicians. These education and training policies relation challenge the effectiveness and efficiency teaching of Physics in secondary schools. The findings imply that there is a need to establish relevant support systems to solve the problems related to teaching and learning of Physics subject. The government should equip schools with all kind of resources such as teachers' manual, instruments and chemicals, Physics laboratories and laboratory technicians. Moreover, this study set out that student and Physics teachers attitude on Physics should change.

4.3.5 Policy(ies) Innovation Mechanisms to Improve Performance in Physics

This section discusses data relating to the policy mechanisms to improve performance in Physics.The research question was, *"What are the policy innovation mechanism to improve performance in Physics?"* To achieve this question, questionnaires, focus group discussion and review of documents were used to obtain information. Results are presented on Table 4.6.

Table 4.6: Policy Innovative Mechanisms to Improve Physics Performance

Mechanism to improve Physics performance	Yes (F)	Yes (%)	No (F)	No (%)
Enhance Physics teacher quality	43	71.7	17	28.3
Equip laboratories with tools and resources	40	66.7	20	33.3
Capacity building (In-service training)	48	80	12	20
Use of modern instruction materials	45	75	15	25
Insist practical and less theory	54	90	6	10

Source: Field Data (2016)

Table 4.6 shows the results of policy(ies) innovative mechanisms to improve performance in Physics. For example, 43 (71.7%) of the respondents expressed that enhancing Physics teacher quality would improve performance in Physics. On the other side, 40 (66.7%) of the respondents said that equipped laboratories with tools and resources is the best policy mechanism to improve Physics performance in secondary schools. Moreover, other respondents 48 (80%) mentioned provision of in-service training to Physics teachers will improve teachers pedagogical content knowledge and therefore improve Physics performance.

Furthermore, 45(75%) of the respondents suggested the mechanism on the use of modern teaching materials. Lastly, out of all the respondents 54 (90%) agreed that making Physics more practical than theoretically will improve student performance in Physics. This signifies that teachers have different views and opinions on the policy(ies) mechanisms for improving performance. The findings are here presented and discussed in detail;

Enhance Physics Teacher Quality

Table 4.6 shows that 43 (71.7%) of the respondents agreed that enhanced teacher quality policy(ies) is one of the mechanisms to improve Physics performance in secondary school. The findings imply the quality of the Physics teacher affect student behaviors and performance in Physics. In further analysis of the focused group discussion, one among the respondents affirmed that;

> *If we need to improve performance, the most challenging mechanism is to enhance teacher quality in Physics. Most of Physics teachers have inappropriate language, and they don't listen to the students' problems. They just do examples on the blackboard and continue to teach…I propose the policy(ies) to focus on the quality of the Physics teachers we have".* (Field data, FGD: September 2016).

The quotation above shows the challenge of having teachers of the high quality in teaching Physics. The findings were in line with the study by Joseph (2014) who reported that the teacher quality affects student achievement in science and make student behave positively or negatively. This implies that the policy should consider and take the quality of the teachers as an important aspect for improving Physics performance in secondary schools.

Equip Laboratories with Tools and Resources

Table 4.6 shows, 40 (66.7%) of the respondentsexposed that equipping Physics laboratory with tools and resources is the mechanism which would improve Physics performance in secondary schools. In more analysis through focus group discussion, one of the respondents asserted that:

> *"You can find that our laboratory does not have tools and resources which could help us to study Physics effectively by doing practically. I suggest to the policy makers to ensure that all laboratories, especially Physics laboratory are provided with fully tools and resources which will help us to do practical and become a good scientist… I assure you if*

> *tools and resources were there we could do very well in Physics".* (Field data, FGD: September 2016)

The quotation above shows that the policy(ies) has a challenge of ensuring adequate facilities and resources are available in laboratories in order to ensure smooth Physics teaching and learning as well as improve performance in Physics. Thus, the policy(ies) should set the need of tools and resources in Physics. The findings concur with the education policies of 2010 and 2014, which explain the need for laboratories and its resources. This implies that even though it is stated in policies, still not done. Thus, there is a need to implement the policies in order to improve Physics performance.

Capacity Building (In-service Training)

The issue of capacity building (in-service training) to science teachers, especially those who are teaching Physics was mentioned as a mechanism, which the policy could stress on in order to improve performance in Physics. Table 4.6 shows that 48 (80%) of the respondents agreed that in-service training is the factor that could be used to improve Physics performance while the 12 (20%) of the respondents found this as less important. For this case, most of the respondents suggested that policy(ies) have to ensure that Physics teachers are attending regular in-service training in order to update their knowledge, skills, and values toward Physics teaching and learning. Through focus group discussion, one among the respondents had this to say:

> *"Every profession needs capacity building. Although we are taught Physics still we need to attend training so as we can share and solve many problems encountered in this field. This should be taken in the*

> *policy as the challenge if really we need to create mechanisms for improving performance in Physics. Surely we cannot forget to undergo in-service training as refresher courses for Physics teachers". (Field data, FGD: September 2016).*

The findings above show that if the policy would stress on in-service training for Physics teachers, would help education practitioners to plan for seminars, workshops, and conferences to train Physics teachers to improve their competence. The findings tally with the study by Ojedirani et al. (2014) who reported the need for regular in-service training for science teachers in order to enable improve their efficiency and hence performance in science.

Thus, it shows that the policy should speak out how in-service training or capacity building would be addressed in various schools whereby Physics teachers would attend and learn new knowledge and skills, which will help them to improve performance in Physics. It was disclosed that teachers are not attending capacity building workshops and training.

Use of Modern Instructional Materials

Table 4.6 above shows, 45 (75%) of the respondents exposed that the policy mechanism should be in the use of modern instructional materials. While 15 (25%) they found this as less important. With more analysis of the focus group discussion, one of the respondents said that:

> *"Our policies are not very much up to date and I recommend the policy to insist on the use of modern instructional materials such as various simulation programs, animations, and computers to take students in the real world Physics…this would make students to understand Physics and perform better"*(Field data, FGD: September 2016).

The quotation above shows that the policy(ies) has a challenge of ensuring that teachers use modern instructional materials which enhance Physics understanding. This findings resemble with the studies done by Nyandwi (2014) and Munene (2014) who reported on the importance of using modern instructional materials for teaching science. This implies that modern instructional materials facilitate easy understanding of Physics concepts through the use of five senses. Thus students may link Physics with real life situations (Anwer et al., 2012). Thus, the policy mechanism is to state how the modern instructional materials would be used in order to strengthen Physics performance in secondary schools.

Insist Practical Learning and Less Theory Teaching

The issue of insisting on practical teaching and less theory in Physics were mentioned as a mechanism which the policy could stress on in order to improve performance in Physics. Table 4.6 shows that 54 (90%) of the respondents agreed that by teaching student practically would improve Physics performance and has to be insisted in the policies.

On the other hand, 6 (10%) of the respondents found this as less important. For this case, respondents suggested that policy(ies) have to ensure that Physics teachers are teaching practically in the laboratories. Also, through focus group discussion one of the respondents said that:

> *"Many teachers do not demonstrate and teach practical Physics. Too many theories in Physics without demonstration and actual practical make student difficult to grasp and understand the concept...as many students lost on the way and lose interest in Physics. I suggest the policy put more pressure on practical Physics by ensuring that facilities are available and teacher and students use them in learning Physics. Really, this would improve performance"*(Field data, FGD: September 2016).

The findings show that policy(ies) stress on practical Physics and discourage theoretical that would help Physics teachers to concentrate much in practical skills and this would help students to understand the concepts. This findings concur with the various policy documents for example (ETP 1995; ETP 1999; ETP 2007; ETP 2010; & ETP 2014) in which all insist on the construction of laboratories for practical learning.

Thus, there is a need for policy(ies) to reconsider about professional development in order to build capacity for Physics teachers. The policy(ies) could emphasize on the role of modern science and technology be used to enhance Physics teaching and learning by ensuring all schools are supplied with technology that could assist to teach and learn both theory and practical Physics.

Discussion of the Findings

Section 4.3.5 presented and discusses on the policy mechanism to improve performance in Physics. The question was *"What are the policy(ies) mechanisms to improve performance in Physics subject?"* The findings of this study were in line with other studies (Anwer 2012; Nyandwi 214; Munene 2014, Joseph 2014; and Ojedirani et al. 2014) which reportedthatin order to improve performance in Physics there are several factors which facilitate each other and end up with the good achievement of student in science learning. This sets out the following:

Firstly, enhancing Physics teachers' quality is the best policy mechanism that would improve performance in Physics. This study disclosed that teacher quality influence

student behaviors and performance. The quality of Physics teacher reflects on the best methods the teacher used to teach Physics and the way teacher motivates learners to learn Physics (PSA, 2015). For example, studies have reported that the teacher of the low quality make student to hate the Physics and lead to low performance (Nkuba 2012; Joseph 2014). Thus, there is a need to strengthen policy on enhancing the quality of Physics teacher because of the quality of the teacher is associated with the improvement of performance.

Secondly, equipped laboratories with the tools and resources contribute to improving Physics performance. This study revealed adequate laboratory facilities are the one which should be addressed and managed in all schools for better performance. It is clear that teaching Physics without well-equipped laboratories are like eating bread without honey. Thus, having laboratories without equipment and resources hinders teaching and learning of Physics (Nguru 2010; Mabula 2012; and Kihwele 2014. Therefore, it is the task of policy to ensure that all Physics laboratories in all schools are equipped with relevant and adequate Physics facilities that would enable practical to be carried out (learning by doing) smoothly.

Moreover, this study has shown that improving performance in Physics needs policies to stress on the provision of in-service training (capacity building) to teachers of Physics. Through in-service training, teachers share their knowledge, skills, and values which make them be more competent in the subject and enable them to teach effectively and efficiently and ultimately improve performance in Physics (Onah and Uguru, 2010). Thus, the policy mechanism with regard to the

improvement of the Physics performance should consider in-service training as part and parcel of any Physics teacher. Therefore, it should be cleared in the policy that every Physics teacher has to attend capacity building at least twice per year.

Moreover, this study revealed that the importance of the use of modern instructional materials. The modern instructional materials which are the result of advance in science and technology provide the use of various computer simulations and programs to prepare the theory and practical Physics. Physics can be taught through animations and simulations via video and CD, as well as PowerPoint projector. The policy should take and address modern media, and expose teachers on the use of ICT for the purpose of improving performance in Physics. For example, the schools which have no Physics teachers could use science and technology to fill in the gap of the shortage of Physics teachers to enhance Physics teaching and learning.

Lastly, this study disclosed that Physics teachers have to make Physics more practical than the theoretical subject. The idea of practical Physics was considered as the mechanism for making student curious and developing the confidence to the students who take Physics that they can do things (change theories, assumptions, and principles into reality) which are visible in the real world (Speering and Rennie 1996; Thomas & Brain 2006). Linking to various assumptions and apply them practically in the laboratory help students to become innovative, and they don’t forget the concepts. Thus, policy innovation mechanism should address more on the practical link of what students are learned and taught in Physics and real life experience. This is argued to be the best way to improve performance in Physics.

Generally, innovative mechanism for improving performance in Physics cut across a number of factors, if all issues are considered as revealed in this study, it could improve performance in Physics in secondary schools.

Concluding Remarks

The purpose of this section was to explore the education policy(ies) innovative mechanism for improving Physics performance in secondary schools. In doing so with regard to the findings in this section, the study has disclosed that there is a need to improve the Physics performance due to the national goal 2025 in which Tanzania strive to become the middle-income country. Thus, the education and training policy innovative mechanism is to focus on how to obtain the competent Physics teachers, establish the best system for capacity building, provide modern facilities such as the use of the new technology for Physics teaching and learning. Also, there is a need to shift the focus of how Physics is taught is crucially important for improving performance in Physics. Since many schools do not have equipped Physics laboratories, the effort should be done to construct Physics laboratory and these laboratories should be equipped with new technologies in order to enable students to learn practically.

4.3 Chapter Summary

This section is the summary of chapter four. It presents some of the major issues appeared during the discussion of the finding. Firstly, this study discovered that students miss learning practical Physics in many secondary schools due to the shortage of the Physics laboratories and equipment. In this sense, Physics is taught

theoretically in most of secondary schools and hence limit the students in understanding Physics concepts and that lead to poor performance in Physics.

This study has exposed that there is a serious issue on the gender imbalance of the Physics teachers in secondary schools. All secondary schools studied found to have no female teacher who teaches Physics regardless to the qualification. Thus, there is an indication that female students mightlose interest in Physics by thinking that Physics is for males students only. This is one of the critical policy issue to observe the gender in Physics in order to impress female students to opt Physics subject. This would improve Physics performance to both males and female students.

Out of the discussion there emerged concern that teachers with higher qualification in education, for example, those with first degree and masters have great chance to improve the Physics performance. However, these teachers as they teach for a long time without attending the refresher course they tend to be outdated and use the traditional ways to teach Physics. Thus, they get into a culture which affects their efficiency and effectiveness in teaching Physics. The need for arranging refresh course is needed because most of the Physics teachers did not attend to any seminar or workshop in Physics, and this is contrary to education and training policy of 1995.

Another issue emerged during the discussion of the result, most secondary schools have no laboratory technicians. The absences of laboratory technicians make Physics teachers playa double role, which is teaching and setting of the Physics practical. This is possible only for schools which have the competent Physics teachers. In some

schools, Physics teachers were not able to prepare the practical of Physics even in the classroom. Due to double role of the Physics teachers, the practical are poorly prepared and even in some situations are not prepared at all. There is a need to provide laboratory technicians in every secondary school who would help the Physics teachers to prepare Physics practical.

Another important issue emerged is to build attitude of both teachers and students. Many students exposed that Physics teachers are harsh and they do not consider their ability in learning of Physics concept as they stressed that Physics is a difficult subject. Physics teachers should support students in learning Physics physically, psychologically and mentally. Also, students should be assisted to change their culture and belief that they can learn Physics like other subjects and perform well.

Lastly, out of the discussion there is a concern that most of the schools lack financial support from the government to purchase modern instructional materials, such as Physics simulations programs, technological devices and internet services, resources such as Physics texts books, Physics reference books, and laboratory equipment. Thus, the need for the government to allocate and release fund for Physics resources in all secondary schools is important for improving Physics performance in secondary schools.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter wraps up the study by providing a summary of the main findings, implications of the findings and conclusion. Moreover, the chapter highlights limitations of the study, recommendations and suggested areas for further study.

5.2 Summary of the Study

The study assessed policy(ies) implication on low performance of Physics in secondary schools. The study was guided by five research objectives. The objectives included the following: assess education and training policy(ies) relation on students' poor performance in Physics subject, investigate education and training policy(ies) relation on the availability of Physics teaching and learning resources, assess the education policy(ies) relation on the availability of quality Physics teachers, investigate education and training policy(ies) challenges for effective and efficient teaching and learning of Physics subject, and lastly, assess education policy(ies) innovation mechanisms to improve the performance in Physics subject.

The study was centred on the education and self-reliance theory (ESR) by Julius K. Nyerere which insisted on learning by doing. The study also used the conceptual framework adopted from the CIPP model. The model had four parts which included context, input, process, and product. The study covered empirical literature related to education and training policies and Physics teaching and learning as well as academic performance.

The study was conducted in Morogoro Municipality, which is the main administrative area of Morogoro region. The study involved five secondary schools. The study also involved 60 respondents; among them there were 10 Physics teachers, 50 form four students who were studying Physics. All sampled schools and respondents were purposively selected. The study employed case study design under mixed approach.

Data were collected using questionnaires, interview guide, focus group discussion, observation checklist and the documents review. In order to make the instrument valid and trustworthy, the researcher pre-tested the instrument at one of the secondary schools. Data collected were interpreted, presented and discussed according to their content. The study employed mainly mixed approach. Qualitative data were subjected to some content analysis while quantitative data were grouped into frequencies and presented using tables. SPSS and Microsoft Excel programs were used to analyze quantitative data. Results were presented in themes on the basis of the five research questions.

In undergoing this study the following critical issues were revealed; Firstly, this study discovered that students miss learning practical Physics because most of secondary schools lack Physics laboratories and equipment. In this sense, Physics is taught theoretically in some secondary schools and hence limit the students in understanding Physics concepts and hence poor performance in Physics.

Secondly, this study exposes that Physics subject is dominated by male teachers. The findings have shown no female teacher was teaching Physics in the studied

secondary schools. Thus, there is an indication that female students maylose interest in Physics by thinking that Physics is for male students only. Hence, there is a need to influence female students to opt Physics subject and eventually becoming Physics teachers in order to encourage and support female students. This would improve Physics performance to both female and male students.

This study also revealed that teachers with higher qualification in education, for example, those with first degree and masters have greater chance to improve the Physics performance. The study extends that teachers with higher qualification on Physics can manage to teach relevant knowledge, skills and values, also can merge Physics theory and practical, and therefore may raise student interest in Physics, which ultimately would improve performance in Physics.

It is also discovered through this study that most secondary schools have no laboratory technicians. The absences of laboratory technicians make Physics teachers play a double role, which is teaching and setting the Physics practical. Due to double role of the Physics teachers, the practical are poorly prepared and even sometimes not prepared at all. There is a need to provide laboratory technicians in every secondary school. This would help students to attend in Physics practical sessions in time and improve performance.

Moreover, this study revealed that negative attitude of the Physics teachers and students lead to poor performance in Physics. This study puts that in order to improve Physics performance, the attitude of both teachers and student should

change. Physics teachers should support students in learning Physics physically, mentally and psychologically. Also, students should be assisted to change their culture and belief that they can learn Physics like other subjects and perform well.

This study also exposed that most of Physics teachers have not attended to any in-service training or refresh course so as to improve Physics pedagogical and academic content, knowledge and skills. This study exposes that if Physics teachers do not attend refresher courses, their effectiveness and efficiency in teaching Physics subject decrease and may yield to poor performance in Physics. As the ETP of 1995, p.55 stress, there is a need to take actions in order to improve performance.

Lastly, the study discovered that most of the schools lack financial support from the government to purchase modern instructional materials, such as Physics simulations programs, technological devices and internet services, resources such as Physics texts books, Physics reference books, and laboratory equipment. This implies that there is a need for the government to allocate and release fund for Physics resources in all secondary schools. It is impossible to improve performance in Physics if the fund is not allocated to purchase the required facilities and resources for Physics teaching and learning.

Generally, this study did not intend to replicate what other studies have done rather this study has disclosed that there is a link between the education and training policy(ies) implication and the poor performance in Physics subject in secondary schools.

5.3 Conclusion

In view of the research findings, the study deduced the following conclusions:

(i) The current education and training policy of 2014 need to focus on the establishment of the use of modern science and technology in secondary schools. Due to the nature of Physics subject, the education and training policy has to link Physics with the change of science and technology, and Physics education should be taught in modernized technologies, such as simulations, animations, internet connectivity, video and real practicals. Thus, the education policy has to show how secondary schools would be equipped with modern science and technological facilities to improve Physics teaching and learning.

(ii) There is a necessity of the current education and training policy(ies) to improve the secondary school's infrastructures. Few secondary schools had adequate Physics teachers and teaching and learning facilities such as Physics laboratories, laboratory facilities, library and books while many schools had inadequate number of Physics facilities. To improve Physics performance in secondary schools, the context of schools has the great impact which needs special attention from the education and training policy.

(iii) This study concludes that culture of the students and the Physics teachers influence Physics performance. The notation from the culture that Physics is difficult subject leads to the poor performance. There is a need to change the culture of students and teachers in order to improve performance of Physics in secondary schools.

Generally, this study conclude that performance in Physics can be improved if the education and training policy(ies) is thoroughly implemented and elements of the poor performance such as poor school environments, lack of laboratory technicians, negative attitude of teachers and students, and use of the modern science and technology are clearly addressed in the current education and training policy of 2014. Moreover, education policy(ies) should be clear about Physics teaching and learning in secondary schools.

5.4 New Developments in Knowledge

The general purpose of this study was to assess the education and training policy(ies) implication for poor performance in Physics subject in secondary schools in Morogoro Municipality, Morogoro region. In the light of the study's objectives, this study indicated that the education policy(ies) implication rest actually on what is happening in secondary schools concerning Physics teaching and learning. This study provides the understanding of the link exists between the education policy(ies) implication and the poor performance in Physics in secondary schools.

As most of the previous studies have focused on the effects of education policy(ies) on Physics performance, this study has gone a step further assessing out the education policy(ies) innovation mechanism for improving Physics performance in secondary schools. Therefore, the government can use this knowledge to review the education policy(ies) statements in supporting and enhancing Physics education in secondary schools.

5.5 Recommendations

Based on the conclusions of this study, several recommendations are made:

5.5.1 Recommendations for Action

To the Ministry of Education, Science and Technology:

(i) It is recommended that the government, through the Ministry of Education, Science and Technology (MEST) should put in place the special policy that would address the issue of Physics only in secondary schools and not treating science subjects in general.

(ii) The Ministry of Education, Science and Technology should provide enough funds to the Teachers Education Department offices. This could assist and facilitate the in-service training to Physics teachers. Hence, address challenges that Physics teachers' face in the teaching and learning of Physics in secondary schools.

(iii) For effective and efficient policies in Physics performance, there should be the involvement of the community in the education policy planning. To achieve educational goals, the study recommends the need for strategies by the government through MEST to improve Physics teachers' living conditions, in terms of good regulation and rules, education and training policy and circular that guides the ways Physics should be taught in secondary schools.

(iv) Given that the explored challenges cause poor performance of Physics students in secondary schools. MEST, Community and Educational Officers should cooperate fully with teacher colleges in handling Physics teachers' training so as to alleviate the challenges.

To the Regional Educational Leaders

(i) The regional educational leaders (REOs, DSEOs, and TSDs) need to pay a visit in secondary schools to talk with teachers as well as students and encourage them to make effective cooperation to alleviate policy(ies) challenges which lead to poor performance of Physics. Also, they need to conduct meetings and seminars to share with Physics teachers on their professional obligations and their right to involve the community in addressing policy challenges regarding teaching and learning of Physics. This would help to avoid some unintentional unengaged of community and unnecessary queries and grievances.

(ii) Management and administration should be improved in secondary schools by ensuring that Physics laboratories are available, also equipment and resources, as well as the laboratory technicians who manage laboratoriesare adequate and work with Physics teachers.

To the student

The students should recognize that Physics is concerned with daily life experiences and it is exhaustive in rules, principles, and assumptions together with practical. Thus, they need to study very hard and do much practical to become competent in the subject.

To the community

(i) Community members should remember that those policies, challenge of poor performance of Physics subject demand their contributing efforts to address

and solve them. Therefore, they should maintain a strong positive relationship with Physics teachers, schools, and the governments by forming an alliance to find the solutions so as to alleviate policy(ies) challenge in teaching and learning of Physics subject.

(ii) Students, Physics teachers, and community members need to maintain relationships of reciprocal learning that are highly open, interactive and inclusive in character. Physics teachers should remember that it is possible to address and solve policy challenges in poor performance in Physics through cooperation with the community. It is the task of the community to form bonds that would transform the policy(ies) in favor of the Physics learning and improve Physics subject performance.

5.5.2 Recommendation for Further Study

(i) There is a need for more comprehensive study to be conducted on other levels of education such as advanced level and higher learning levels to explore the policy(ies) challenges facing teaching and learning of Physics subject.

(ii) Another study can be conducted to explore policy(ies) challenges for Physics teachers working environments and the implementation of the Physics curriculum in the community secondary schools.

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APPENDICES

Appendix I: Questionnaires for Physics Teachers

I'm a student of the Open University of Tanzania, pursuing Masters in education administration, planning and policy studies (MED APPS). I humbly request your readiness to participate in the study, which investigates the Low performance in Physics subject looking on policy implications.

Gender ..... level of education.....

Tick which is correct

1. My teaching experience in Physics subject is:

   A . 1- 4 years ☐ **B**. 5- 8 years ☐ **C**. 9 years and above ☐

2. Do you have a Physics laboratory in your school

   A. Yes ☐ **B**. No ☐

3. Your Physics laboratory possess enough lab equipment

   A. Yes ☐ **B**. No ☐

4. Do you know how to use the Physics lab equipment in your teaching?.

   A. Yes ☐ **B**. No ☐

5. Do you think your college studies enough for you how to use Physics lab equipment?

   A. Yes ☐ **B**. No ☐

6. To what extend your college or university studies helped you to know how to use the Physics lab equipment?

   A. Not help ☐ **B**. Average ☐ **C**. Excellent ☐

7. Is your study(ies) in the college/ university correlate with what you are teaching Physics subject in secondary school?

A. Not help ☐ **B.** Average ☐ **C**. Excellent ☐

8. Hard you get any in-service training on Physics subject to improve your teaching methods?

A.Yes ☐ **B**. No ☐

9. Do you have any idea about our National Education Policy?

A. Yes ☐ **B**. No ☐

10. Is there any Physics laboratory technician in your school?

A. Yes ☐ **B**. No ☐

11. What should be done by the government to improve the performance in Physics subject?

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12. What can you suggest the Educational policymakers on how to improve students' performance in Physics subject in secondary schools?.....

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Appendix II: Questionnaires for Advanced Level Students

I'm a student of the Open University of Tanzania, pursuing Masters in education administration, planning and policy studies (MED APPS). I humbly request your readiness to participate in the study, which investigates the Low performance in Physics subject looking on policy implications.

Tick the appropriate answer in the box.

1. Gender ..... School: .....
2. Age .....(in years)
3. Are you interested in studying Physics subject?.

   A.Yes ☐ **B**. No ☐
4. Is there any laboratory in your school?.

   A.Yes ☐ **B**. No ☐
5. If the answer (above) is yes, is your laboratory have enough equipment?

   A. Yes ☐ **B**. No ☐
6. Did you get difficulties in studying Physics subject?

   A. Yes ☐ **B**. No ☐
7. Our Physics teacher is competent in both theory and practical?

   A. Yes ☐ **B**. No ☐
8. Is practical being prepared and conducted reflect what is in the final National Examinations?

   A. Yes ☐ **B**. No ☐

9. Are our Educational policies reflecting what is in your studies of Physics subject?

A. Yes ☐ **B.** No ☐

10. What do you suggest to the both government and other educational stake holders as well as educational policy makers on the Physics subjects in both advanced level and ordinary level students?.

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11. Is there anything you would like to share with me concerning Physics subject or our educational policies.

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Appendix III: Questionnaires for Ordinary Level Students

I'm a student of the Open University of Tanzania, pursuing Masters in education administration, planning and policy studies (MED APPS). I humbly request your readiness to participate in the study, which investigates the Low performance in Physics subject looking on policy implications.

Tick the appropriate answer in the box.

1. Gender..... School:.....
2. Age .....(in years)
3. Are you interested in studying Physics subject?.

   A. Yes ☐ **B**. No ☐
4. Is there any laboratory in your school?.

   A. Yes ☐ **B**. No ☐
5. If the answer (above) is yes, is your laboratory have enough equipment?

   A. Yes ☐ **B**. No ☐
6. Did you get difficulties in studying the Physics subject?

   A.Yes ☐ **B**. No ☐
7. Our Physics teacher is competent in both theory and practice?

   A. Yes ☐ **B**. No ☐
8. Among all science subjects, I'm performing high in Physics suggest in my terminal and annual examinations

   A. Yes ☐ **B**. No ☐

9. Physics is the simple subject to me.

   A. Yes ☐ **B**. No ☐

10. I like practical on Physics subject.

    A. Yes ☐ **B**. No ☐

11. What are your suggestions on educational stakeholders like the Ministry of Education, Technology and Training, Physics teachers and Educational policy makers concerning how to improve Physics subject in secondary schools?.

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    .....

    .....

Appendix IV: Observation Checklist

School name……. Identity……

Date of observation……. Time…….

SEDCTIONB: Observation

S/N	Category observed	Status	
		Yes	No
1	Presence of Laboratory equipment		
2	Presence of Physics textbooks and reference books		
3	Presence of laboratory technician		
4	Proper usage and storage of Physics laboratory equipment		
5	Presence of Physics teachers		
6	Presence of Physics policies		
7	Presence of fund for Purchasing equipment for learning Physics		

Appendix V: Interview Guide

SECTION A: Personal information

School name……. Identity……

Age……

Sex…….

The level of Education…….

Year of experience as Physics teacher…..…..…….

Date of interview……. Time…….

SECTION B: Interview questions

1. What do you think are education and training policy(ies) issues inrelation with the poor performance of Physics in secondary schools? Explain?
2. How do you explain the education and training policy(ies) challenges on the availability of quality Physics teachers? Why?
3. What do you think are the education and training policy(ies) challenges face the effective and efficiency teaching of Physics? Why?
4. How do you think the education and training policy(ies) could focus so as to improve Physics performance in secondary schools? Why?

THANK YOU

Appendix VI: Focus Group Discussion

SECTION A: Personal information

School name……. Identity……

Age……

Sex…….

The level of Education…….

Year of experience as Physics teacher…..…..…….

Date of interview……. Time…….

SECTION B: Focus Group Discussion (FGD)questions

1. What do you think are policy(ies) issues that contribute to the poor performance in Physics in secondary school? Explain.
2. What do you think the policy(ies) could do to eliminate the poor performance in Physics? Why?
3. What are the education and training policy(ies) challenges about the availability of teaching and learning resources in Physics? Why?
4. How do you think the education and training policy(ies) can do to improve Physics performance in secondary schools? Why?
5. What things could you suggest to the policy makers and government on improving Physics performance in secondary school?

THANK YOU

Appendix VII: OUT Research Clearance

THE OPEN UNIVERSITY OF TANZANIA
DIRECTORATE OF RESEARCH, PUBLICATIONS, AND POSTGRADUATE STUDIES

Kawawa Road, Kinondoni Municipality,
P.O. Box 23409
Dar es Salaam, Tanzania
http://www.out.ac.tz

Tel: 255-22-2666752/2668445
Ext.2101
Fax: 255-22-2668759,
E-mail:drps@out.ac.tz

Date: June 8th 2016.

The Regional Administrative Secretary (RAS),
P.O.Box 650,
Morogoro.

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an act of Parliament No. 17 of 1992, which became operational on the 1st March 1993 by public notice No. 55 in the official Gazette. The act was however replaced by the Open University of Tanzania charter of 2005, which became operational on 1st January 2007. In line with the later,the Open University mission is to generate and apply knowledge through research. To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance,on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology,to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you MGANI, Noel HD/E/650/T.11 pursuing Master of Education in Adminstration,Planning and Policy Studies.We hereby grant this clearance to conduct a research titled "ASSESSMENT OF LOW PERFORMANCE IN PHYSICS SUBJECT IN SECONDARY SCHOOLS: POLICY IMPLICATION". He/She will conduct his/her research at Morogoro Municipality (Morogoro Secondary schools) in Morogoro Region from June 8th, 2016 to July 8th , 2016.

Incase you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P.O. Box 23409, Dar es Salaam. Tel: 022-2-2668820.We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

Yours sincerely,

Prof Hossea Rwegoshora
For: VICE CHANCELLOR
THE OPEN UNIVERSITY OF TANZANIA

Appendix VIII: Research Permit from RAS - Morogoro

THE UNITED REPUBLIC OF TANZANIA

PRESINDENT'S OFFICE
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT

Telegraphic Address: "REGCOM"
Phones: 023 2604237/2604227

Fax No: 260 09 73
In Reply please quote:

Regional Commissioner's Office,
P. O. Box 650,
MOROGORO.

Ref. No: AB. 175/245/01/154

14/06/2016.

District Administrative Secretary,
Morogoro District,
P. O. Box 68,
MOROGORO.

Re: RESEARCH PERMIT

Please refer to the above mentioned subject.

I am writing to introduce to you **MGANI NOEL** a Student from Open University of Tanzania who at the moment is required to conduct the Research title as **"ASSESSMENT OF LOW PERFORMANCE IN PHYSICS SUBJECT IN SECONDARY SCHOOLS: POLICY IMPLICATION".** The period of his research is granted from **June, 8th, 2016 to July, 8th, 2016**.

Please provide him the necessary assistance to enable the accomplishment of research in your District.

Thanking you in advance.

Ndayahundwa Hendry
For: **Regional Administrative Secretary**
OR: REGIONAL ADMINISTRATIVE SECRETARY,
P. O. Box 650,
MOROGORO REGION.

Copy: - Vice Chancellor,
The Open University of Tanzania,
P. O. 23409 Box 512,
Dar- es- Salaam.

- Mr. Mgani Noel - **Researcher**

Appendix IX: Research Permit from the DC - Morogoro

JAMHURI YA MUUNGANO WA TANZANIA
OFISI YA RAIS
TAWALA ZA MIKOA NA SERIKALI ZA MITAA

Anuani ya Simu:MKUU WA WILAYA
SIMU NAMBARI: 2614096
FAX NAMBARI: 2613848

Unapojibu Tafadhali taja:

Kumb Na. AB.210/249/01/C.220

OFISI YA MKUU WA WILAYA,
WILAYA YA MOROGORO,
S.L.P 681,
MOROGORO.

Tarehe 15 Juni, 2016

Mkurugenzi wa Mansipaa,
S.L.P 166,
MOROGORO

YAH: KIBALI CHA KUFANYA UTAFITI

Kibali kimetolewa kwa Bwana Mgani Noel ili aweze kufanya utafiti katika shule za sekondari za Morogoro sekondari ya Kingalu, sekondari Lutheran Junior Seminary, St Peter Junior Seminary na Kilakala sekondari juu ya watoto kutofanya vizuri kwenye Somo la Fizikia (***Assessment of Law Performance in Physics subject in secondary schools policy implication).***

Kibali hiki kinaanzia 15/06/2016 hadi 15/07/2016.

Kwa barua hii naomba walimu wa shule tajwa wote ushirikiano

E.T.Nzunda,
Kny: KATIBU TAWALA WILAYA
MOROGORO

K.N.Y. KATIBU TAWALA WILAYA
MOROGORO

Nakala: Shule zote atakazofanya utafiti

Bw. Magani Noel
Mtafiti