ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

RELEVANCE AND QUALITY OF RESEARCH UNDERTAKEN BY MASTER'S STUDENTS OF ADDIS ABABA UNIVERSITY

BY

MESFIN BISRAT

OCTOBER, 2013

ADDIS ABABA

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A THESIS SUBMITTED TO THE INSTITUTE OF EDUCATIONAL RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ART IN EDUCATIONAL RESEARCH AND DEVELOPMENT

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Approved by the Board of Examiners:

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External Examiner	**Signature**

DECLARATION

I, the undersigned, declare that this thesis is my work and that all sources of materials that are used for this study have been dully acknowledged.

Name: MESFIN BISRAT

Signature_____

Date October, 2013

Abbreviation and Acronym

ERIC- Evaluation of research in context

ECUBRR- European Commission University based research report

HEPE- Higher education proclamation of Ethiopia

HESC- Higher education strategic center

HERQA- Higher education relevance and quality agency

M A – Master of Arts

MOE – Ministry of education

MOST- Ministry of Science and Technology

MSC – Master of Science

UNESCO- United Nation Education, Science and Cultural Organization

Abstract

The purpose of this study was to examine relevance and quality of research undertaken by Master's students in the years from 2009 to 2011 in the department of Physics and Mathematics education. The study employed a mixed methods approach and data collected using questionnaires, interview together with relevant Documents. The participants of the study included instructors, research supervisors and research examiners of Addis Ababa University, Office for the Preparation of education policy, Office for the curriculum preparation, Higher Education Relevance and Quality Agency (HERQA), Ministry of Science and Technology, Rules and Regulation of the University and research undertaken by Master's students. All data was analyzed using quantitatively and qualitatively. The findings of the study showed that relevance and quality status of research undertaken by Master's students was poor. The major factors that contributed to the problem include inadequate interaction between the university and its stakeholders, lack of research funding, heavy load and extra university duty of supervisors, limited research skills of the candidate (students) and time constraints. The University has rules and regulations that clearly identified thematic areas of research but it was ineffective or failed to ensure those thematic areas in to action. To overcome the condition mentioned above, the researcher suggested that the University or its departments familiarize research thematic domain to the students before they engage in title submission and both the university and its stakeholders would be better if they work together.

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CHAPTER ONE

INTRODUCTION

1. Background of the study

The widely accepted core mission of university is education, research and service. Through research, they create valuable knowledge that serves as the foundation for many technological advances (Clark, 1983). The university can also disseminate knowledge that will be applied to the problems of society and economy (Clark, 1983). Research is an activity which is concerned primarily for knowledge dissemination to academic peers, society and students (Tariq, 2011).

Thesis work considered not only as a requirement for postgraduate studies but also as part of knowledge dissemination activity of the university. They have developed their own mechanism of regulating the quality of the thesis work (Kalmonovitz guidelines, 2012/13).

Thesis work considered not only as a requirement for postgraduate studies of Addis Ababa University but also as part of knowledge dissemination activity as well as scholarly work of postgraduate students (AAU research guidelines, 2012).

In many universities, a thesis or a dissertation represents the culmination of a major research project that should make a significant contribution to knowledge in a given field (Mzumbe University research guidelines, 2010).

The United Nation Education, Science and Cultural organization reported that research relevance, quality and utility are interrelated (interdependent) (UNESCO, 2006).

Based on the summary of the above literatures it can be said that, thesis work besides its requirement for the fulfillment of their entitled degrees, it is also considered as a source of knowledge. Again research utilization is dependent on research relevance and quality. Therefore: any kind of research or thesis work to be reliable (acceptable) source of knowledge it has to be valid or sound both in terms of concept and scientific process.

Ensuring the validity of the research or the quality of the research is not enough as it was mentioned from the above literature; it is also expected to be relevant to research thematic areas of the University. That is why the UNESCO report confirmed that research relevance and quality are very important for the utilization of research work.

Many countries experience also showed that they evaluated the relevance, quality and impact of the utilization of postgraduate research and documented it; as a result of this, they directed the research work towards solving academic problems, boosting innovative work, addressing societal needs as well as reliable knowledge creation tools through this work they accomplished the core mission of their university.

When we come to the reality of Addis Ababa University, the University recently welcomed a brand new vision of becoming a preeminent research university in Africa. The university began postgraduate studies in 1978/79. Since then, the theses undertaken by Master's students like other research work are considered as the university's primary goal of disseminating knowledge. But in reality until recently, research reports have tended to remain on bookshelves, unread and untouched by policy makers, other researchers or practitioners (Derebssa, 2004). While research has direct and quick impact on practice in higher institutions, its applicability is generally limited (Derebssa, 2004).

Identifying relevance and quality status of research undertaken by Master's students are very important for either to consolidate the existing system if it is very good in ensuring relevance and quality or if it is not effective, to examine the existing system of ensuring research relevance and quality of research work at Master's level because consolidation of the system helps for the accomplishment of the university core mission that is reliable knowledge dissemination, research utilization as well as boosting innovative work. The reason for undertaking this study is that, there are no empirical studies regarding the relevance and quality of research work produced by Master's students. As a result of this, their status was not known so far in terms of relevance and quality. That is why as researcher I am highly interested in doing this study for the first time, paving the way for further studies and to bring all the research work in line with the core mission of the university.

1.1 Statement of the Problem

Postgraduate students have been carried out research since the launching of postgraduate program in 1978/79 at Addis Ababa University. There are however growing concerns about the status of research or thesis work in terms of relevance, quality and the usage of such research outputs by stakeholders. Most of such research outputs are put in shelves as a result of this condition, many people considered those research work of postgraduate students in general as a work that has been done only for the entitled degree requirement only than a work that has used as a reliable source of knowledge. Despite such in clarity concerns about the condition related to such research work in terms of their relevance, quality and their usage, there are no documented empirical studies concerning the status of research carried out by postgraduate students. Hence this study intended to examine the relevance and quality of research undertaken by Master's students at AAU. This study addresses the following basic research questions

I. Research undertaken by Master's students at AAU, they look like in terms of their relevance and quality?

II. What are the factors that influenced relevance and quality of research undertaken by Master's students at AAU?

III. Is there a mechanism to ensure relevance and quality of research undertaken by Master's students at AAU?

1.2 Objective of the Study

The objective of this study is to examine relevance and quality of research undertaken by Master's students at AAU, more specifically the study intends to

1. Determine the status of research undertaken by Master's students in terms of their quality and relevance.
2. Identifying the departments rules or regulations effectiveness in terms of ensuring relevance and quality of research work of Master's students
3. Examine the factors that influence relevance and quality of research undertaken by Master's students of AAU.
4. Identifying the mechanism on how to ensure relevance and quality of research work of Master's students.

1.3 Scope of the Study

This study is delimitated to investigate relevance and quality of research undertaken by Master's students at AAU. It involves the research works of Master's students at Addis Ababa University, the case of Mathematics and Physics education departments in the years from 2009 to 2011. Research undertaken by the Academic staff and Master's students of other departments except Mathematics and Physics regular students are beyond the scope of this study.

1. 4 Limitation of the Study

1. The absence of formal pilot testing before actual data collection was made.
2. Limited subject knowledge of Mathematics and Physics to assess pre test and post test contents of the research work to compare research questions with their questionnaire.
3. Lack of time and finance

1.5 Significance of the Study

This study is very significant for many reasons. It is important to know

- If the university or departments have the standard or the rule for ensuring research relevance and quality, to show the strength and weakness of it, in ensuring the relevance and quality of the Thesis work.
- If the university or the departments do not have the rules or regulation to show the importance of having it.
- Every year Resource investment on research activities to be considered in line with the relevance and quality of research work.
- Initiating our universities and other concerned bodies to involve more on the task of ensuring relevance and quality of research.
- To all the stakeholders of research such as policy makers, curriculum developers as well as others to play their own significant role in ensuring research relevance and quality.
- To initiate similar research reviewing activities based on relevance and quality by other researcher within Addis Ababa University as well as in other universities.

1.6 – Operational Definition of terms

The following terms are used in this study and will have the following definitions.

Academic matters: - academic matters means issues related to teaching and learning, knowledge creation activities through scientific research, curriculum and its associated issues.
Research: - means Master's thesis undertaken by postgraduate students for their partial fulfillment for the entitled degrees.

Postgraduate students:- here the term postgraduate students mean those students who are already graduated or currently learning for Master's degree in any universities in any discipline.

Quality: - is the conformance to requirements.

Hard science: - it includes chemistry, physics and biology science.

Quality of research*:* - "the research which is completed in time, having rigorous research design which is internally and externally valid, based on reliable data sources, use of appropriate analytical methods which are meaningful in practical and statistical terms.

Relevance: - here relevance means how much of those researches undertaken by postgraduate students of the two departments have related to- academic and curriculum issues, national education policies in general and 70:30 national policy in particular and the need of the society.

Policy: - course of action adopted and pursued by the government, ruler, political party etc.

70:30 policy;- this is a policy introduced by the Ethiopian government as of 2001 E.C. the policy mainly emphasize that, out of 100 students who joined the preparatory school as well as the higher educational institutes must be a student's of non- social science stream with the objective of producing more Science and Technology manpower's in the country.

Research papers: - a paper or thesis undertaken or going to be undertaken by second degree Master's degree students in any of postgraduate schools.

Rules and Regulations: - it is a body of laws. In each department they outlined their own research thematic areas (research emphasized points). In order to ensure this research domain they formulate either a rule or regulation. That is a governing what rule or regulation mean.

R&D- Research and Development

Stackholder's:– thos**e** groups that have interest in the research that are undertaken by postgraduate students.

? – Symbol used when the year of publication for published and unpublished material is unknown or not mentioned in the material.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

The University is a highly treasured place for the pursuit of truth and intellectual excellence through nurturing the habit of free inquiry and scholarship as well as research, through the propagation and dissemination of knowledge and its preservation thereof. In this connection, the AAU has been engaged in research and community service activities since its establishment in 1950. As a result of the research activities of members of the University, important contributions have been made to society in various sectors. aau.edu.et/research-and-graduate-program.

Higher education and research contribute a lot to the overall development of a nation based on the experience of different countries. Teshome (2004) strongly argues that we need to develop higher education provision and research in order to bring about a sustainable increase in economic and social development. Through research and higher education, it is possible to ensure success in human development as they play a significant role to economic growth and poverty reduction, successful implementation of development policies and strategies too (Mekuria, 2008).

The theses that are undertaken by Master's students are considered as the final report on a wide-ranging research program that meets accepted criteria. It will be publicly available and as source of knowledge to them (AAU guidelines, 2012). There is a marked difference in content, presentation and often method between research inspired by scholarly interest or an academic requirement and an evaluation undertaken with a definite practical problem in mind. Research typically aims at producing new knowledge which may have no specific reference to any practical decision while evaluation is deliberately undertaken as a guide to action (Desalegne, 2000).

University with the founding principles as its starting point and having acceded to the mission and vision affirms its commitment to the following three fold mission for the medium long term:

1. To continue to respond to challenges and to create new traditions

2. To continue to help meet the demands of the 21st Century by nurturing individuals to become future leaders and by supporting cutting edge research

3. To continue to serve society by contributing education and research results for a sustainable global community (Hosei University).

Based on the summary of the above literature it can be said that, university considered as center of treasured for knowledge. This happened as a result of research by different university members. Knowledge creation and dissemination is considered as the primary duties of universities. To create and disseminate knowledge, the source of all this activity should be credible. That is what is meant by research quality. Universities are the source of social and economic development. So in order to be the source of social and economic development, their education and their research work to be relevant to the need of society and the economy. Similarly the founding principle of universities also outlined that responding the challenge of the time as well as serving the need of the society is very crucial.

2.1 Conceptual consideration

2.1.1 Definition of Research

Many experts in the field of research have described research as a "science". Whitley (1996) describes science as the systematic process for generating knowledge about the world. it consists of three important aspects; the goals of science, key values of science and perspectives on the best way in which science can go about generating knowledge (Kelly, 2009). Based on this explanation, research is a science and adopts systematic process for knowledge creation.

Research refers to a process of steps used to collect and analyze information to increase our understanding of a topic or issues at a general level, research consists of three steps: Such as posing a question, collect data to answer the question and Present an answer to the question (Creswell, 2012). Similarly as Schreiber and others (2011), defined research as a systematic process of active inquiry and discovery through collecting, analyzing and inferring from data so that we can understand a given phenomenon in which we are interested. Research in all of its forms and procedures really boils down to systematic and disciplined Inquiry.

Similarly, Kothari argue that, research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation (Kothari, 2004). From this research means a way of looking for knowledge.

2.1.2 Purpose of Research

Universities have three purposes; knowledge creation, knowledge dissemination and community engagement (Badat, 2009). The Universities knowledge creation can takes place through research. Research has different purposes. Let us see some of the purpose of research depicted in different literature as follow.

Knowledge creation

There are many ways to "know" things or to establish knowledge. For example, some people may rely upon intuition and folklore for certain types of information. Experiential knowing may occur when people have experienced certain events. People also may rely upon authoritative sources such as publications (newspapers and magazines), television programs; news programs and documentaries) or trusted individuals (including parents, teachers, doctors, or experts in the field). Some of these methods rely upon science and the scientific method, while others do not. Science is only one method of inquiry. It has many advantages, including legitimacy (especially in Western cultures), but it is not without its flaws (Tennessee, 2003).

In the same way, research is defined by Moses (1990) that: "Research is the systematic and rigorous investigation aimed at the discovery of previously unknown phenomena, the development of explanatory theory, its application to new situations or problems and the construction of original works of significant intellectual merit (Tariq, 2011). This is the other purpose of research for knowledge discovery.

Problem solving

There are two different types of research: basic and applied research. These two research types are used in a variety of studies and disciplines. Basic research is about understanding the various processes between memory, learning and knowledge. It is about finding information. While it may become applied later, it is not sought out for its application to current events. With basic research, researchers choose to research topic of interest to them. It

is about figuring out the answer without necessarily figuring out an answer that is applicable to curing a type of disease or to a current problem that they are trying to solve in science today. It is about finding knowledge. It is learning for learning's sake where as applied research is about dealing with practical problems faced in our world today. For example, if someone were to do research on a way to end cancer then this would be applied research. If they are attempting to find the answer to something that would help solve a practical problem (Gabrielle Schrader, 2010).

Research has its special significance in solving various operational and planning problems of business and industry (Kothari, 2004). As noted by Creswell, research has the following purpose. A research report might provide a study that has not been conducted and thereby fill a void in existing knowledge. It can also provide additional results to confirm or disconfirm results of prior studies. It can help by adding to the literature about practices that work or advance better practices that educator might try in their educational setting. It can provide information about people and a place that has not been previously studied (Creswell, 2012).

Economic Development and Policy improvement

The other purpose of research is related to its role for economic development and policies. One way in which university research is thought to affect the local economy is by stimulating corporate research and development (R&D) activity. Industry labs directly promote local economic development (Hill, 2006). On the other hand, among different types of research, Policy research is a special type of research that can provide communities and decision-makers with useful recommendations and possible actions for resolving fundamental problems. Such research provides policy-makers with pragmatic and action-oriented recommendations for addressing an issue; (Staven Dukeshire, 2002). So research can play a very significant role for policy making as well as to assess the progress and impact of the policy. It is increasingly accepted that to use universities and public research organizations as nucleus and source of economic development. The earliest scholars pointed out that, the necessity of close university-industry interactions as a means of national economic prosperity. This is the other crucial purpose of research.

In addition to helping educators become better practitioners, research also provides information to policy makers when they do research work and debate educational topics. Policy makers may range from federal government employees and state workers to local school board members, administrators and they discuss and take positions on educational issues important to constituencies (Creswell, 2012).

To summarize the above points, research can play positive role by improving human understanding through knowledge creation, giving ways of problem solving, giving vital information for policy makers in every level as well as enhancing economic as well as other aspect of development. Research can improve or make human life better.

2.2 Relevance of research

Universities have frequently been regarded as key institutions in the processes of social change and development. The most explicit role they have been allocated is the production of highly skilled labor and research output to meet the perceived economic needs. One facet of quality in research is that it meets the needs of the moment, or … is 'timely' such research is more likely to be used (Brennan, 2004). To bring social change and development there must be relevance of research to social and developmental issues. This is what relevance of research mean.

Universities have frequently undertake and encourage relevant study, research and community services in national and local priority areas and disseminate the findings as may be appropriate; this means that they promote and enhance research focusing on knowledge and technology transfer consistent with the country's priority needs (HEPE, 2009). Based on this proclamation research that is relevant to national priority areas are encouraged. This is what research relevant means.

On the other hand, relevance of research work would be evaluated based on the association of the outlined research themes of its institution. This research theme includes problem solving and knowledge creation for teaching and learning, addressing contemporary national and international issues (Gabrielle Schrader, 2009). This is what is meant by research relevance in terms of problem solving, knowledge creation as well as addressing both national and international concern of the time.

On the other hand, Many higher education systems in the industrialized world have moved from; model, 1 (producing new knowledge for its own sake) to Model, 2 (producing knowledge in the context of application that addresses societal needs) as noted by(Martin and Etzkowitz, 2000 as cited in Mulu, 2009). The author further noted that the form of model

2 that is knowledge production is characterized by a growing diversity in the localization of research activity (Schiller and Diez, 2007). Here localizing research activity means making research activity relevant to the need of the local issues, this is what relevance of research means in other word.

The University should become responsive to societal needs and include in its research programs a sizeable component of research applied to national needs and technological research for the solution of problems in such fields as food, industry, energy etc (Derebssa, 2004). This is what relevance of research in terms of societal, national needs as well as for problem solving.

Research can plays an important role in the formulation of educational policies. There are three kinds of research in education they are diagnostic research to generate knowledge, prognostic research for predicting the future and evaluating research for assessing impacts or outcome (Bikas, 2005). As noted above, relevance of research means association of research topic with the issues of educational policies, teaching-learning, knowledge creation and educational programs. Based on those kinds of research mentioned above, research can contribute for the success of educational policies and programs.

To summarize the above concepts, research relevance means association of research topics with research themes of the higher educational institutions. This includes like academic issues including teaching and learning, knowledge creation as well as addressing national and international contemporary concerns. Universities can bring social and development change not only through teaching and learning only but also through their research outputs. So in order to bring the expected change through their research output their research areas must concede or relevant to those outlined areas. That is what research relevance mean. On the other hand, any university to be responsive to societal needs as well educational policies, their research work or topics could be relevant to address the need of the societal need as well as the need of national educational policies. This is what research relevance mean.

2.3 quality of research

Quality of research is very crucial for acceptance of the findings as well as for its implementation into action in any research The relation between ethics and quality in qualitative research can be discussed from three angles (1) quality is seen as a precondition for ethically sound research (2) reflection of ethical issues and (3) doing research according to quality standard (Flick, 2007 as cited in Teklegirema, 2012). Quantitative data analysis, issues of validity and reliability is important while qualitative data analysis is very personal process. In qualitative data analysis, it asks the researcher to analyze, transcript and they will probably come up with different results (Dawson (2007).

So what is research quality mean? Different groups define the quality of research in their own ways. Let us see some of the definitions given by different writers as follow.

Quality is the conformance to requirements; hence the quality of research bears all the characteristics which are required by its users. It may have internally and externally valid research design, reliable data sources, free from plagiarism practices, application of appropriate tools, and meaningful interpretation of results in practical and statistical terms (Fink, 1998, as cited in Tariq, 2011). Based on the above definition, we can understand that there are different characteristics that are required to be fulfilled. Those characteristics that are ensuring both kinds of validity, appropriate research design reliability of the data's, originality of the work and usage of appropriate tools together with in conformance of stakeholders' interest.

Quality of research most commonly refers to the scientific process Encompassing all aspects of study design; in particular, it pertains to the judgment regarding the match between the methods and research questions, selection of subjects, measurement of outcomes, and Protecting against systematic bias, nonsystematic bias, and inferential error (Boaz & Ashby, 2003; Lohr, 2004; Shavelson & Towne, 2002). Based on this understanding, research quality can be evaluated using all those variables.

On the other hand, as it is noted by the Association of Swedish Higher Education Experts' Committee, quality research is a research that stands the test of being Scrutinized by highly recognized peers within the field, has a substantial impact on the development of the research field and finally provides a useful contribution to society in the short or long term, either directly or indirectly *(*Carleson, 2006).

In general, quality research can be tested using different aspect of its process such as methods versus research questions, its minimizing capacity against systematic and non systematic biases, the originality of the research work etc. So research quality is very important for any activities based on its findings. If the research does not have quality means it does not have any use at all since its findings or results do not have reliability at all.

2.4 Indicators of relevance and quality of research

Relevance, quality and utility are interrelated or dependent to each other (UNESCO, 2006). Based on this report relevance has no value without having quality and quality has nothing to do without relevance. If there is relevance and quality then the next step is how to bring utility again after utility then what comes next the question of assessing impact based on utility. So the question is now, how to measure relevance and quality? Relevance and quality of research can be measured by the use of a certain indicators. Those indicators are mentioned by different writers. Let us see some of the indicators for measuring relevance and quality of research as follow.

2.4.1 Indicators of relevance of research

It is possible (and valuable as well) to assess the degree to which a higher education Institution is achieving its stated mission, goals, aims and also it is possible to assess the relevance of the institution to the needs of the society (Lynn meck, 2005). The writers further noted that, the significance of performance indicators is due to many factors, not the least of which is an institutional desire to implement more effective strategic planning mechanisms and government demands for greater efficiency and effectiveness on the one hand and enhancement of the quality of higher education on the other. The increased use of performance indicators needs to be seen as part and parcel of a broader move to entrench an 'evaluative culture' in higher education institutions and systems, fuelled by the dual demands of accountability and quality assurance. There are indicators of relevance of research. Based on those indicators we can measure relevance of research. Let us see some of the indicators for research relevance as follows.

The degree to which research contributes to and creates an understanding of the development of societal sectors and practice (such as industry, education, policy making, health care) and the goals they aim to achieve and to resolve problems and issues (such as climate change and

social Cohesion) a well-founded expectation that the research will provide such a contribution in the short or long term (Eric, 2010).

As noted above, the standard of research relevance can be measured by the contribution of research to improve the life of the societies. Their contribution can be measured through the development of the societal sectors and practice and the change they bring as a result of their involvement in the area of climate change, social change, economic development and change of other crucial issues of the society. All the above mentioned issues are indicators for measuring research relevance.

On the other source, European commission university- based research group explained about the standard or indicators for measuring the relevance of research in association to the need of the society as follow. universities should be funded more for what they do than for what they are, by focusing funding on relevant outputs rather than inputs, Competitive funding should be based on institutional evaluation systems and on diversified performance indicators with clearly defined targets and indicators supported by international benchmarking. Based on this report, relevance of research should be measured based on practical activity directly in relation to the outlined target by the institutions (ECUBRR, 2010). Therefore, any research work should be evaluated based on the result or the contribution of its outputs. From this fact, research output is a standard.

2.4.2 Indicators of Quality of Research

Much of the judgment of quality and worth of scientific research has been subjective and largely left to the science experts themselves. But over the last few years, there has been a growing trend amongst a number of government and governmental policymakers to adopt more 'objective' criteria and externally imposed input-output measures to more rigorously and empirically assess scientific performance (Wood et al, 1993 as cited by Lynn meek, 2005). The writers further noted that the ability to attract research funds depends upon the research focus of the institution (whether that would be at the university, faculty or school level) and whether or not these issues are aligned with National Research Priorities.

There are different indicators for measuring the quality of research undertaken by postgraduate students. Let us see some of the indicators as follow. Quality research can be defined in operational term as the research which is completed in the given time, having

appropriate research design which is internally and externally valid based on reliable (credible) data sources, free from plagiarism or originality of the work, use of appropriate or the correct analytical methods which are meaningful in Practical and statistical terms and has a practical use (Tariq, 2011*).*

As noted above, the quality of research can be measured in terms of time, appropriateness the research design with the nature of the study, internal and external validity, reliability of data's and originality of the research work that can make one research to be quality ones. All those factors are indicators for measuring the quality of research.

In consolidation of the above idea, the quality of research work undertaken by postgraduate students as follow. Being postgraduate students, they have a lot of challenges to overcome those challenges such as family commitment, work load, finance problem, etc. which may affect their achievement (Ismail and Abiddin, 2009). As it is noted by Ismail and Abiddin, there are different indicators that can affect the quality of postgraduate research such as finance, family and work load since most postgraduate students have already had family. The writers further noted that most postgraduate students are either they are self sponsors or they are scholarship students. As a result of this, they have to finish their work on the given time. This situation pressurized them and as a result of this situation, it affects the quality of their research work. Based on this all those issues like finance, family and work commitments are indicators of the quality of the research.

On the other source regarding the indicators of quality of research there is a standard to be fulfilled. But there is no consensus on a specific set or algorithm of standards that will ensure quality research, so the more research studies are aligned with or respond to these principles, the higher the quality of the research (Feuer & Towne, 2002; Shavelson & Towne, 2002). As noted by these scholars, any research achieving only one or two standards are not typically sufficient to assert quality. For example, some scholars suggest that while standards such as peer review and standardized reporting are important benchmarks.

As it is described by the Russell (1996) the examination of supervision has the potential to make an important contribution to the quality of Postgraduate research. Therefore, supervision is concerned with the mechanics of ensuring that the student makes good progress towards completion (Hocky, 1996 as cited in Ismail and Abiddin, 2009). As noted by the writer that, revising or examining the role that the supervisors can play are very crucial to ensure the quality of research undertaken by postgraduate students. The writers further

noted that if the supervisors have commitment at least we can minimize problems, such as ethical, technical as well as methodological aspect of the research. This means that based on the commitment level of the supervisors we see indicators for ensuring or affecting the quality of research.

To summarize the above concept, a research to be called quality research it is expected to fulfill the required standards. Even if the standards may vary according to the nature of postgraduate schools. Based on the above sources all those issues like method, design, time, financial problem, work and family commitment as well as supervisor's commitment level considered as an indicator of quality of research since their existence or their absence determine the quality status of research undertaken by postgraduate students.

2.5 Research as a Requirement for Postgraduate studies.

In most universities, research undertaking considered as a requirement for postgraduate studies since there is a strong relationship between teaching and research. Based on this ground, let us assess different universities experience in relation to research undertaking and postgraduate studies as follows.

The guidelines clearly define the roles of each party and provide crucial information about supervision, preparation, processing and submission of research proposals and theses. In developing these guidelines, the requirements as stipulated by the University and the Graduate School have been taken into account. The students are therefore strongly advised to familiarize themselves thoroughly with these requirements and guidelines (Kenyatta University thesis guideline, 2011).

The mission of the School of Postgraduate Studies is to promote excellence amongst postgraduate staff and students through responsive teaching, Postgraduate Studies research, supervision, scholarship and instructional pastoral support. The school of postgraduate has the responsibility to Coordinate, the consideration and processing of postgraduate student research proposals, theses and dissertations (University of Namibia Guidelines, 2013).

Similarly the Nigerian university of Jose, thesis work is considered as a requirement for postgraduate students as it is clearly mentioned in the university regulation article 14(1) as follow. No program of postgraduate study shall be complete unless it prescribes a

requirement for a compulsory course of independent research work into a specific problem (University of Jose, 2004-2008).

The master's the**sis** is a demonstration of a postgraduate student's ability to explore, develop, and organize materials relating to a certain topics or problems in a field of study. The goal of the thesis is not only to pursue research but also to create and develop an extended scholarly work. The thesis work is evidence originality, critical, independent thinking, appropriate organization and format and thorough documentation (Saint Mary's college of California, 2012-2013).

Most postgraduate students view research work as just another "requirement" to complete their entitled degrees realization and continued involvement with the research community as a consumer or participant should play a central role in their professional lives (Baillie. 2004).

In respect to dissertation/thesis presentation and submission emphasis has been put on the requirement for candidates to produce scientific publications. In this document where a student undertakes studies by research only, the report written at the end of the studies is referred to as "Thesis" while where it is by course work and research it referred to as "Dissertation"]. Consequently, an option for an alternative format for dissertation/thesis presentation in form of a number of articles combined with a synthesis introduction and conclusion is now being introduced (Sokoine university postgraduate guidelines, 2010).

To summarize the above points that research work at postgraduate studies considered as a requirement for intellectual and scholarly report of postgraduate students. This has a contribution for the scholars through the skill of critical assessment of other's research work as well as independent work of their own. On the other hand, they can contribute to the academic activity of their university.

2.6 The Experience of other Countries in Managing Research undertaken by Postgraduate (Master's) Level

There is a substantive side to the agenda for mobilizing research. What is needed here is a major effort to rethink the priorities for the kinds of research that universities should focus on. This is obviously a task that will lead to different results for different countries, regions, and universities but it is instructive to look at a sample of the issues that, during the Colloquium, were identified as being in particular need of scholarly attention:

- The connection between research and the social project of development
- The importance of creating and sustaining autochthonous knowledge (as distinct from externally defined knowledge)
- The need for a critical examination of the notion of research "relevance", and the implications of such examination for defining research criteria (UNESCO, 2006).

As it is mentioned by this report, rethinking is very important for the priorities and relevance of research with social development and knowledge creation based on internal definition is very important. On the other hand, there are gaps in linking (relating) research with development priorities. Universities in developing countries are not fully geared towards solving development related problems. There are weak linkage (relevance) between knowledge producers and knowledge users, between production and innovation (as summarized by Zakari and cited in Mulu, 2009). Acknowledging the problem of relevance and quality of research that is undertaken by postgraduate students is concerned, Different countries have their own different experience in addressing the challenge. Let us see some of them as follow. First let us start from the European Union about the role of higher education research. If higher education is one of the engines of the economy and a key point on the 'knowledge triangle' then the productivity, quality and status of research produced by universities is a vital indicator, hence the importance of designing a way to evaluate *which* is truly fit for purpose *(*EU report, 2010).

As noted by the European Union Director General for research, higher education institutions are the engine for the economy and research undertaken by universities are the key for creating new knowledge and increasing productivity. The quality and relevance status of those research works as well as ensuring their reliability in knowledge creation and designing a way for evaluation become important. From the European Union perspective we understand that since research plays key role for economic development and knowledge creation, ensuring their quality and relevance for purpose is their main concern.

On the other additional development, the European Commission report of the university-based research group has developed additional mechanism to ensure relevance and quality of research as it is mentioned as follow. Universities should be funded more for what they do than for what they are, by focusing funding on relevant outputs rather than inputs. Based on this report, the European Commission experience in relation to funding university research showed us, each university would be funded based on relevance and quality of their research output rather than inputs. To ensure continued funding for their research work, they must undertake institutional evaluation that encourages their research work to the targeted output. From this we can understand that through this process how they can regulate research relevance and quality.

On the other hand, Association of Universities of the Netherlands has the following experience in relation to managing relevance and quality of research undertaken by universities. Universities and individual investigators must explicitly consider the societal relevance of their research activities. And also report on it explicitly. Core questions are: 'Do we do the right things?' and 'Do we do them right?' This implies that next to indicators of scientific Quality, attention should be given to indicators of societal relevance (Outcomes of higher education, 2008).

According to the Association, the main concerns of universities are ensuring both relevance and quality of research undertaken by postgraduate students as well as the academic staffs. When universities are undertaking their research work in the whole of the Netherlands, they have to ensure the relevance and quality of their research. Based on the above explanation, the two important issues of research relevance and quality described in question like this 'Do we do the right things?' here it meant research relevance second 'Do we do them right?' here it meant research quality.

Again the Association of Universities of the Netherlands further noted that there is a project in the Netherlands doing evaluation of research in context. Its main duties are mentioned as follow. The majority of the research performed by higher education institutions and research institutes in the Netherlands are publicly funded. These institutions enjoy a relatively large degree of autonomy when it comes to how they spend the resources. They must, however, be able to show that, the research meets the required standards. A system of research assessment was developed for this purpose. Over time, this system has developed into a way of meeting

accountability and obligations both external, towards the public and politicians and internal, towards governing boards (Evaluating research in the Netherland, 2010).

In similar development, when we see the Canadian experience they have addressed the problem of research Relevance in the following way. For example, the Canadian Health Services Research Foundation specifically focuses on building 'linkage and exchange' between researchers and policy-makers in research priority setting, funding, proposal assessment and in the conduct and communication of research in order to enhance the utilization and impact of research on policy as well as to evaluate this impact (BMC Health service Research,2006)

Based on this source, there is a link between researchers and policy makers. The main purpose of this linkage is to make both the researchers direction in their researching activities to relate with the priority areas of the policy makers to consolidate all policies to be research based ones as well as increasing research utilization. This is the Canadian ways of addressing the problem of research in terms of relevance and quality ones.

2.7 The Ethiopian Context regarding the Requirements of Postgraduate Research work

Teaching and research are the two primary tasks carried out in an integrated manner by any university. Addis Ababa University is no exception and it has developed a general guideline that governs the link between teaching and research. According to the current Ethiopian education and training policy, higher education should be research oriented (MOE, 1994 and in the legislation's of higher education institutions (HEP, 2004). Based on the above literature we can say that, research work to be considered as a requirement for Universities.

It has been widely accepted that, the institutions of higher learning should be concerned with production and reproduction of knowledge. The postgraduate program of AAU which was launched in 1978/79 has greatly contributed to research output through M.SC. /MA theses. (Deribssa, 2004). Postgraduate students are required to produce a thesis work as their fulfillment of their entitled degree (AAU guidelines, 2012).

Based on the AAU guideline for the procedure of writing and examination, thesis is a test of intelligence, endurance and commitment. It opens up the chance to organize and present scholarly work in an intelligible and convincing manner to a wide audience. Thesis will be

made publicly available as widely as possible in keeping with one of AAU's primary goal of disseminating knowledge. Based on this concept, undertaking research work is an obligation for postgraduate students of AAU (AAU guidelines, 2012).

The AAU has been articulating research undertaking as one of its missions since its establishment in 1950. Research undertaking further articulated with the establishment of the school of postgraduate studies in 1978/79 to provide postgraduate education and stimulate research (Mulu, 2009).

Research at AAU has been given a new organizational platform under a new direction and a new set of policy framework. The change at AAU underscored that research should proactively respond to the national demand for generating new knowledge and technology. Office of the vice president for research and technology transfer (VPRTT).

Research should be relevant to the national demand of generating new knowledge and technology. As noted by the university guidelines for writing, examining and grading manual (AAU guidelines, 2012), postgraduate students have an obligation to undertake research for scholarly requirement as well as part of knowledge disseminating goal of the university.

Besides the charter's right, according to Derebssa's explanation, the Addis Ababa University recognizes scientific research as an important prerequisite for economic growth, technological advancement and increased societal welfare (Derebssa, 2004). Again the writer further noted that, among the two source of research work, the school of postgraduate research has a big contribution to research output at Addis Ababa University. The Master's thesis or dissertation outputs have promoted the research interest of the various academic sectors of the university. Based on the above explanation, the Master's thesis or dissertation outputs are still the continued activities as every postgraduate student are required to undertake research for their scholarly contribution as it is mentioned above in the guidelines of the university.

2.8 The Factors that influence the relevance and quality of research undertaken by postgraduate students and ways to ensure them?

2.8.1 What were the factors influencing relevance and quality of researches?

Human society requires universities – they are not an added extra, they are an essential part of the fabric of our civilization, our educational provision, our search for new knowledge and our civic life (University of Bristol, 2002-2013). Universities play a crucial role in society for the generation and diffusion of knowledge. In recent years, the university is assuming a 'third mission', contributing to society and economic development more directly. This new mission has been coined as the "entrepreneurial university'.

On the whole, there is a positive correlation between relevance, quality and utility. There has been substantial criticism at the Colloquium of the notion that there can be a one-dimensional set of criteria for assessing the quality of research regardless of where, by whom and on what subject it was performed. Instead, there appears to be a need dealing with the assessment of research quality in much more differentiated ways like taking into account the research setting, the kinds of research questions asked, the methodological orientation and the utilisation of research findings. This is not to argue for rank relativism in assessing research but recognizing research quality is not entirely independent of its relevance and utility (UNESCO, 2006).

Research at AAU has been given a new organizational platform under a new direction and a new set of policy framework. The change at AAU underscored that research should proactively respond to the national demand of generating new knowledge and technology. Office of the vice president for research and technology transfer (VPRTT).

Despite a new organizational platform as well as a set of new policy frame work to respond to the national demand in paper but practically as it is mentioned in Mulu (2009), there is no evidence that show institutionalized collaboration and partnership or memorandum of understanding between the university and industry or business sector regarding research or any other related services. As a result of this condition there is no relevance and quality of research.

In order to make research relevant, efficient and effective, there is a need for constant flow of ideas from researchers to policy-makers and vise- versa. In Ethiopian situation this dialogue has not been existed at the level it should exist. This is partly been due to the absence of a clear- cut policy on the role of research for development (Derebssa, 2004). Based on the Derebssa's idea, one reason for the problem of relevance of research is due to poor linkage between researchers and policy-makers.

The major reasons cited for the absence of research relevance and quality in Ethiopia as it was summarized by Mulu as follow.

- Lack of research-industry partnership. This is related to the lack of emphasis by the government, private sector and the university management on academic research.
- Lack of adequate funding. National and institutional levels funding policy that stimulate university research in relation to the development need of the time.
- Absence of institutional commitment and support. Creating strong university-industry partnership requires commitment from the university, the government and the industry/business sectors. This is related to the level of awareness of both partners regarding the importance of such partnership.
- The other reason is that the inability of the university to prove itself as an indispensible tool for socio-economic development of the country. The university should enable itself to deliver what is expected from it in terms of creativity, innovation and relevance (Mulu, 2009, page 322 -324).

In relation to the factors affecting quality of research in Ethiopia was summarized as follow. The quality of research institution of higher learning is affected by contextual Environment, the availability of basic inputs from outside and within the institutions. Hence any viable future policy and strategies for promoting quality research must be holistic in nature (Derebssa, 2004).

The above literature is all about the factors that affect the relevance and quality of research from the context of AAU. Let us see from foreign literature about it.

According to the Nigerian experience universities have poor linkage with their stakeholders as a result they are not properly serving the industries due to poor interaction. So the universities are not sufficiently serving the needs of industry essentially (Linking university research and industry in Nigeria, ?).

Above source further noted that The Symposium observed that "linkages between Nigerian universities and the economy including agriculture, industry and service sectors are poorly

envisioned, unorganized and ad hoc in nature. Hence, research products and innovations from the universities are either unrelated to the problems of end users or unknown to or ignored by the potential users, that is, the private sector, entrepreneurs and industrialists" the Colloquium will provide opportunity for brainstorming to unravel the critical elements of the needed innovation networking model that will match the Nigerian context of the stakeholders are different. This difference happened as a result of poor correspondence or relationship between the universities and the stakeholders. This means that the research undertaken by the universities are not relevant to the need of the research users.

On the other source, the main problem for research relevance is due to weak linkage between the universities with the research users such as industries. In countries such as Korea, collaboration between the university and industry in research and development has been weak. One recent survey of Korean firms reported that 50% of all responding firms have never had research collaboration with a university (Lee, 2002). Based on the above finding the existence of poor linkage between the universities and the industries affect the relevance of research work. Research undertaken by the universities and the demand of the research users become different. This is the result of communication barrier between the two sides. As a result research undertaken by the researchers does not have the chance of being implemented in to action.

Again according to the Kothari's explanation in relation to the problems of research relevance and quality in India associated to the poor interaction between the university research departments with its stake holders such as government, business groups and others as it is mentioned as follow. There is need for developing some mechanisms of a university—industry interaction program so that academics can get ideas from practitioners on what needs to be researched and practitioners can apply the research done by the academics (Kothari, 2004).The problems related to research relevant to the need of the research users is due to the weak linkage between the universities and their stakeholders. As a result of the creation of appropriate interaction between the university and its stake holders in order to get things to be done based on the need of the stakeholders both in terms of their quality as well as their relevance. Here is the root cause for the problems of research topic to become irrelevance with the need of the users. It is one of the causes for the problem of resource wastage.

On the other source in relation to the problem of research relevance we have the UK experience as follow. In the UK, recent policy-orientated research by Gibbs (2001) and JM

Consulting (2000) indicates a failure of institutional strategies to link teaching and research effectively, or at least to do this in a purposeful and explicit manner *(*Jenkins and Healey 2005).

Based on the UK experience the main reason for research relevance problem is related to the failure of institutional strategy to link research with teaching. This failure affects the research activity to feed the teaching- learning activities and as a result of this fact both side do not know each other. This is one reason for the problem of research relevance.

Again according to the explanation of different writers as cited by Tariq, the main factors affecting the quality of research especially those research that are undertaken by postgraduate students are concerned underlined this concepts. The quality of postgraduate supervision continued to be a critical factor in the retention and timely completion of postgraduate research students Carole and Margare (2002, p.56). The quality of research is directly or indirectly related to the quality of the teachers, research courses, and supervisors of research and the facility in the university (Isani & Virk 2005*,* Tariq*, 2011)*.

According to above sources, there are different critical factors that affect the quality of research work by postgraduate students such as the quality of teachers, research courses or curriculum issues, research supervisors as well as the existing facilities within universities are the main issues that can help to measure the quality of research. According to the University of Idaho, the other factors affecting the quality of research undertaken by postgraduate students are supervisor's heavy work load/not enough time**.** Unfortunately, many faculty members (perhaps especially the most competent and professionally involved ones) are genuinely too busy to take the time they would like to take to work with each of their students (university of Idaho).

Based on this information, most advisors do not have enough time for consulting their advisee as a result of heavy load as well as additional duties within the university. Due to this situation, without doing constructive work time has come to its conclusion. This condition seriously affects the quality of the research work.

According to Ismail, students undertaking postgraduate studies at university are under increasing pressure to complete within timeframes. Among the challenging issues includes the following. Age, experience and diversity, part-time and full timer, change of their need over time/place/space some time with, but mostly without Scholarship or other funding

supports (Ismail and abidden, 2009). Based on the above writers, lack of financial support for postgraduate students research work can affect the quality of their research work. So this is the other factor that can affect the quality of research work by postgraduate students.

In similar development regarding time and heavy burden impact is concerned the following concept consolidated the above ideas. very often the burden of heavy teaching and advising loads and of other, sometimes extra-university responsibilities keeps otherwise capable researchers from living up to their research potential (UNESCO, 2006).

To generalize the above point's there are different factors that can influence or affect the relevance and quality of research undertaken by postgraduate students are the existing poor university-industry linkage, lack of adequate funding, time, supervisor quality as well as their advisement , research curriculum, teacher's quality as well as other factors.

2.8.2 What are the ways of ensuring relevance and quality of research?

The research practices of universities and industry as well as other knowledge producers are drawing closer together. All are now in effect actors in the knowledge business (Michael Gibbon, 1998). Quality in the sense of achieving academic excellence has always been a central value in higher education". Institutions of higher education have at their beginning relied on the reputation of their faculties to attract students, scholars and to give credibility to their degree programs, postgraduates and their research (Murtadha et al, 2011).

The main function of universities are to do teaching and research. The quality of research is a question mark for many developing as well as developed centuries. This is not the concern of Pakistan but other developing and developed nations are also taking steps for quality research (Tariq, 2011). Based on the above literature it can be said that both researchers and research users considered as actors. Quality can be defined academic excellence. But now the concern of many developing as well as developed nations' universities is the issues of research quality become very crucial.

Let us see some of them as follow. According to the association of the universities of Netherlands regarding the task of ensuring relevance and quality of research they have the following experience. Because of the diversity and variation that exists between universities

of applied sciences and domains, the system leaves responsibility for quality assurance, including the performance evaluations on research units to each individual university of applied sciences *(*Association of universities, 2008).

According to the above association, the responsibility of ensuring relevance and quality of research is given to each university to handle based on their own context. From this fact we clearly understand that one of the mechanism for ensuring relevance and quality of research is based on the reality of each discipline to be handled based on their rules and regulations or the policy of each university. This is one way of ensuring relevance and quality of research.

On the contrary to the above source the other mechanism to address the problem of relevance and quality of research is forming a joint responsible body comprising both the universities as well as the stakeholders. According to the experience of the Swedish higher educational experts mentioned the following mechanism regarding this issue.

It is obvious that external stakeholders are part of the university landscape and need to be addressed when discussing research quality and research approaches both on the level of researchers, by university leadership and the university sector (Carlsson, 2006) According to the given explanations that the task of ensuring relevance and quality of research is not only the responsibility of the universities but it is also the responsibility of all stakeholders such as the funding groups as well as the societies who expect some kinds of benefit from the outcome of research.

To summarize the above ideas in relation to the mechanism of ensuring relevance and quality of research both the universities as well as the stakeholders have common responsibility to this task. Based on different literature mentioned above stakeholders' interaction is crucial to ensure the relevance and quality of research. Similarly relevance without quality and quality without relevance is meaningless as it is mentioned above so as to ensure both relevance and quality of research.

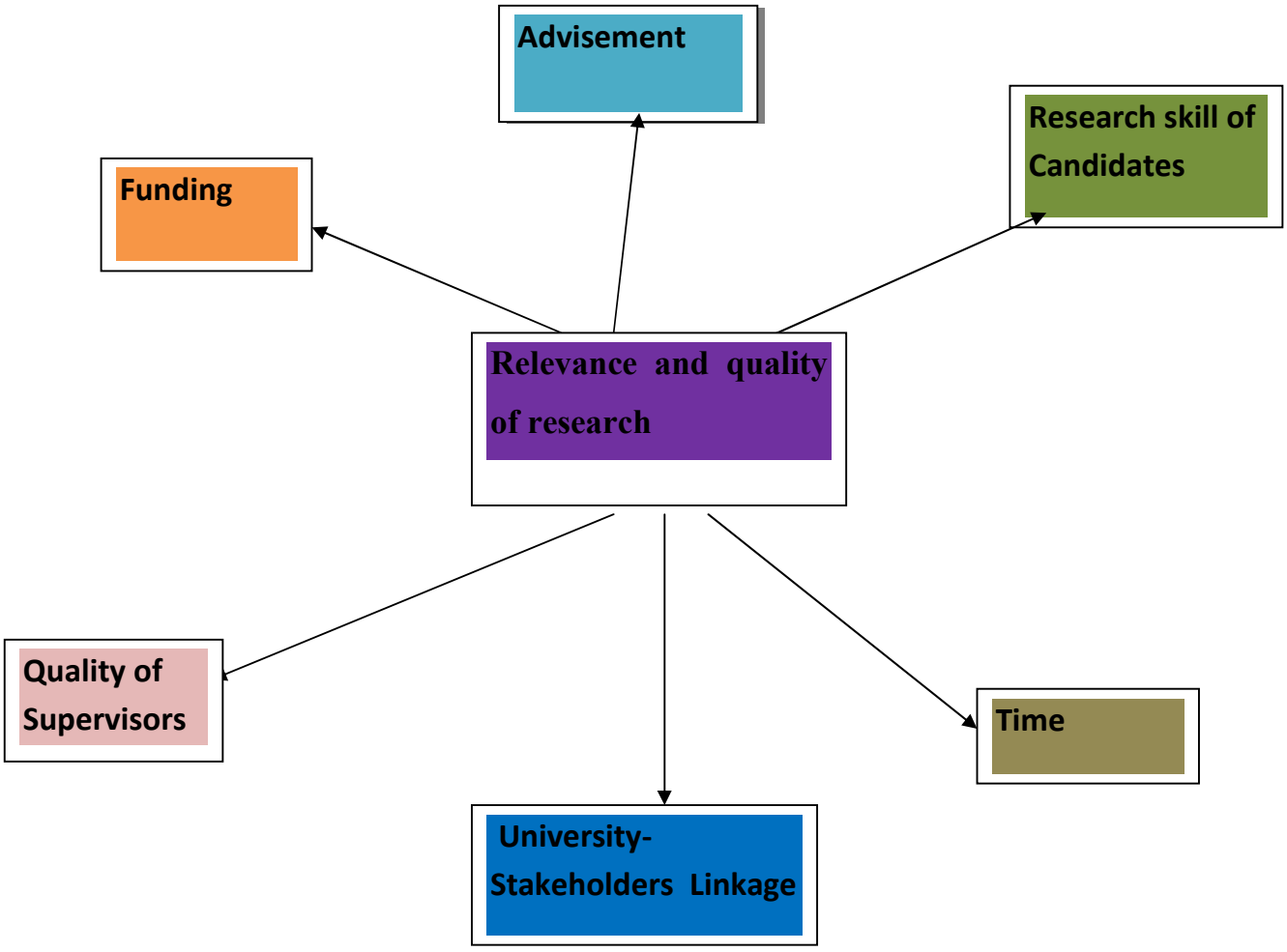
2.9 Conceptual Model of the Study

In this study the researcher is going to assess the status of research undertaken by postgraduate students at AAU, the case of mathematics and physics education departments from 2009 to 2011. The reason for choosing the two departments was their role for science and technology as well as their role for 70:30 national educational policy of Ethiopia. In order to identify the following important issues such as assessing the status of research undertaken by postgraduate students in terms of relevance and quality, factors influencing the relevance and quality of research and the mechanisms of ensuring relevance and quality. The researcher adopted mixed research method. In relation to the research design, the researcher adopted concurrent research design. Relevance of research defined in this study as a research directly related to academic matters, national educational policies as well as societal demand.

The definition of quality of research means, it is defined in terms of the usage of appropriate methods, design correlation with research question, in terms of internal and external validity, originality of the research work, based on reliable data sources and use of appropriate data triangulation which are meaningful in practical terms. The mechanism of ensuring relevance and quality of research means, it is ways of ensuring or handling the condition of relevance and quality of research undertaken by postgraduate students. In other words, who is going to handle it?

The factors that influence relevance and quality of research undertaken by postgraduate students was concerned, the following issues were identified. It includes Funding, time, quality of the supervisor, advisement, research skill of the candidate and university and its stakeholder's linkage.

Fig.1 **Conceptual Model of the Study. The conceptual model of the study show that the independent and dependent variables of this study.**



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

In this study, mixed method approach with concurrent mixed method was employed mainly for the following reasons.

- It builds the strength of both quantitative and qualitative data for my study.
- It provides extensive data using both data collection instruments. Sometime adopting one type of method may not be enough to address the research questions. Collecting more data's using every possible instrument become crucial to answer the research questions. Regarding the design the researcher adopted Concurrent mixed methods design to collect both quantitative as well as qualitative data's. the main reason for adopting this design was because
- It helps the researcher to collect both data simultaneously.
- Both data are analyzed separately and this helps me to check the reliability of one source of data from the other source of data's. So among different kinds of mixed method design, concurrent design in my view, it is the most feasible, reliable, time saving and easy for application.

3.2 – Participant of the Study

The study subjects in this study were selected purposefully. It included education policy makers (HESC), Curriculum Development Office, Higher Education Relevance and Quality Agency all under the Ministry of Education, Ministry of Science and Technology and research supervisors, instructors and academic department heads of Addis Ababa University. In addition to the above subjects research undertaken by postgraduate students from the department of physics and mathematics education and rules and regulation of the university would be reviewed. This study was done in the two departments, just as a sample among all postgraduate studies. So the questions of the existence or non existence of Mathematics and Physics education department has no problem at all rather, it is the matter of reviewing research undertaken by postgraduate students in terms of relevance and quality. This study can initate others to do in other department.

3.3 – Sample, sampling technique and sample size.

There was 88 research papers (MA thesis) undertaken by postgraduate students in total in the years from 2009 to 2011 regular program of Mathematics and Physics education department. I selected 40% (17 from Physics and 18 from Mathematics 35 research papers totally in number) from each research papers using simple random sampling technique as the sample size of the study. I chose simple random sampling technique just to avoid biases as well as to increase the validity of the data's. Regarding the selection of people who can participate in the questionnaire and interview were concerned, I used the technique of purposive sampling since concerned people for this study are limited. The total numbers of participants selected under this technique were 40 people but the actual people who participated in the questionnaire were 33 only. The reason for the absence of the rest of the participants were due to their over occupation in their university and office duties. The total people who participated in the interview part were 15 out of 33 individuals and they were selected based on their responsibility. All the participants were summarized as follow.

Table- 1 shows participants of the study.

Participants	AAU	Higher education relevance & quality agency(HERQA)	Education policy Makers (HESC).	Curriculum development office	Ministry of science and technology
Instructors	8	-	-	-	-
Academic Department heads	4	-	-	-	-
Directors	-	-	1	1	1
Office experts	-	4	5*	5	4

*Among 5 participants one was female.

NB. Two academic department heads from Mathematics and Physics department heads. One from the former education faculty dean and one from research and technology transfer office of AAU.

3.4 – Data Collection Instruments

Three instruments were employed for data collection. The questionnaires, interview and document analysis were source of data for this study. The Document analysis part includes content analysis of research papers (MA thesis) that are undertaken by postgraduate students and the other part of document analysis includes rules or regulation of the university. Questionnaires and interview was the other instruments used in this study.

The reason for employing those three instruments was mentioned as follow-

- When data was collected using different instrument, it can increase the reliability and validity of those data. Since accuracy of one data can be confirmed or disconfirmed by the other source of data.
- Data collected through document analysis should be evaluated with those data collected from the other two instruments. This helps to increase the credibility of one data to the other.
- It helps also to collect more data so as to respond the research questions in appropriate and satisfactory way.

3.4.1 Questionnaire

In general two kinds of the questionnaires were formulated based on the nature of the respondents. The researchers divided the nature of the respondent in to two. They were academicians like research supervisors, research teachers as well as academic department heads of AAU. The second part of the respondents was non academic department heads as well as experts outside academic institutions. They are called office workers. Therefore the questionnaires were identified questionnaire for academicians as well as questionnaire for office workers. The entire questionnaire was distributed by the researcher himself in each of the respondent office.

In general all the questionnaires have five parts including general background about the respondents. In part I information like their educational background in relation to research teaching, advising post graduate researchers as well as background information about postgraduate students was included. Part II deals about the status of relevance and quality of research undertaken by postgraduate students. Part III deals about information about the common factors influencing research relevance and quality. Part IV deals about the

mechanism of ensuring relevance and quality of research at postgraduate level. The final part of the questionnaire is open ended ones. In this part information regarding what is going to be done in the future to improve the condition would be included. See appendix-I for Academic staff and Appendix II for Non academic respondents.

3.4.2 Interview

In similar fashion like the questionnaire there were two kinds of participants on the interview part. Those respondents were recruited from the AAU like academic department heads, research supervisors as well as research examiners. They were selected based on their role in ensuring research relevance and quality at postgraduate levels. Seven individuals including Mathematics and Physics department heads, coordinator and officer were participated from the university. The other participated in the interview were department heads from HERQA, HESC, from MOST and from MOE. In general two non academic department heads and senior and junior experts in total 8 people were participated from outside the university.

Based on the nature of interview around 10 general questions were already prepared. All the questions were modified by the nature of the respondent during interview process. The interview questions were relevant to the research questions. The interview took place both in the university and the office of the interviewed people. During the interview process all the necessary notes properly collected using hand writing and mobile recording. The interview questions would be attached in appendix-III.

3.4.3. Document and content analysis

Documents that are part of this study include rules and regulation of the two departments and research undertaken by Master's students of Mathematics and Physics education departments. As a result of this study mainly dependent on document analysis and both documents that were used by this study were very authenticated by the university as a result of this fact, the researcher did not make any reliability test at all rather, it took a significant number of research papers (17 from Physics and 18 from Mathematics, 35 research papers in total) as a sample of the study. They would be analyzed in relation to their contribution for identifying research thematic areas as well as their effectiveness in ensuring relevance and quality of research undertaken by postgraduate (Master's) students. The other part of the document analysis was research undertaken by postgraduate (Master's) students of Mathematics and

Physics education in the years 2009 to 2011. The research papers content would be analyzed in terms of their relevance and quality status. As far as choosing the two departments were concerned since both departments were not only because of their close associated with 70:30 national educational policy but also they have significant role for science and technology education in our country.

3.5 Description of Variables

This study had seven variables and six of them were independent ones and one was dependent variable. The independent variables were variables that are manipulated by the researchers. The independent variables were lack of adequate fund, supervisor's quality, Advisement, university- stakeholders' linkage, time and research skill of the candidate. The dependent variable is Relevance and quality status of research undertaken by postgraduate students of the two departments in the years 2009 to 2011. Research skill of the candidate would be measured based on the research supervisors' perspective. University-stakeholders linkage means the interaction between the researchers or the university with the users of the university research such as policy developers, curriculum makers and the like.

3.6 Data Quality Assurance

Data Quality assurance aims to assure that the data were collected in accordance with these procedures and that the data stored in the registry meet the requisite standards of quality, which are generally defined based on the intended purposes. In order to increase the quality of those data, the researcher used the integrated system for collecting, cleaning, storing, monitoring the questionnaire and the interview. Both the questionnaires and the interviews undertaken to be checked from the existing documents and document analysis such as research papers, rules and regulations prepared by the university and other relevant documents. In addition to this, to increase the quality and reliability of the data the researcher undertook the task of detail explanation about the research questions before the collection of data through the questionnaire and the interview so as to make everything clear for all research participants. This helps to get

I. Relevant data from the respondent based on their understanding of the target of this study.

II. Despite detail explanation about every issue, there was data screening activity in every process. If data were not completed or any unclear issues it was easy to identify and can be completed before the beginning of the next process since the number of the participants were very manageable in terms of their size.
III. Questionnaire was prepared in easy, understandable and self explanatory language to be responded easily by all respondents of all levels.

NB. In this study there was no pilot testing since the numbers of participants of this study were very limited in number in association of the subject under study as well as the study itself was mainly emphasized on Document Analysis on those MA theses that were already undertaken by postgraduate (Master's) students. Data collection process using the questionnaire and interview was undertaken so as to confirm or to disconfirm those data's collected using document analysis. In order to get accurate data from the questionnaire and the interview; all of those questions in the questionnaire and interview, have been examined thoroughly first , giving the draft of the questions to the future respond and collecting important comments from them and re corrected many times was made accordingly.

3.7 Data Analysis Technique

In this study, both quantitative as well as qualitative data was collected. Once the data were collected, the next step would be the task of analysis. According to my design, both quantitative as well as qualitative data to be analyzed side by side. The quantitative data can be analyzed using both inferential and descriptive analysis. The researcher used SPSS software. Regarding the qualitative data was concerned; the researcher used both thematic as well as comparative technique. Document analysis would be undertaken as follow. First the task of reviewing relevance status of all research papers (88 of them) based on the outlined criteria of relevance. The Second part of the analysis work was determining the quality status of research papers. This part of the analysis has undertaken by choosing the sample from the total research papers (88) using random sampling technique to represent the total population. The size of the sample was 35 in number or 40% from the total population. From the total 35 research papers 17 of them were taken from 43 physics research papers in the years from 2009 to 2011 whereas in the same years 45 research papers of mathematics 18 of them were taken in to the sample of the study. The quality status of the research papers were reviewed in association of methodological aspect.

CHAPTER FOUR

4. PRESENTING ANALYSIS AND DISCUSSION

This chapter deals with the analysis and discussion of data from interview, questionnaire and the documents analysis.

4.1 Characteristics of the Participants

Respondent of this study were drawn from different offices that are in charge of Higher Education Relevance and Quality of research. They were selected purposefully for their involvement in higher education relevance and Quality ensuring activity of research. Hence participants of this study were Addis Ababa University (AAU), Higher Education Relevance and Quality Agency (HERQA), Education Strategy Centre (HESC), Curriculum Development Office under the Ministry of Education and Ministry of Science and Technology as seen in Table below.

Let us see the characteristics of each of the participants in relation to relevance and quality of research at postgraduate (Master's) level.

Addis Ababa University research instructors, research supervisors, Academic department heads and others are the one who play a crucial role for ensuring relevance and quality of research undertaken by all levels. They are the one that influence what research thematic areas to be at the university level as well as at departmental level. Besides this, they are the one who teach research course to the candidate. They are also research supervisors of the candidate. Through this process, they guide the candidate from the inception of the proposal to the completion of the research work. In general they are the engine for the success or the failure of the research work of the candidate. Regarding the university and its stakeholders' (research users) interaction is concerned; again they have their own influence. That is why they become part of this study.

Educational policy makers, curriculum development office and higher education relevance and quality agency of Ministry of education are also selected as participants of this study mainly for the following reason. The above mentioned offices are semi autonomous office under the Ministry of education and they are the one that directly involve

in higher education activities. They involved through education policy making, curriculum development and revising the progress of the policy and the curriculum. The Addis Ababa university postgraduate department of Mathematics and Physics education is directly associated with teaching/learning, curriculum development, implementation, educational policies and other relevant issues with Mathematics and Physics education. In other word they are stakeholders. The research work or the output of this school is supposed to be an input for them as a result of their association. That is why this study selected them to be part of this study.

The other participant of this study was **Ministry of Science and Technology** since this Ministry is working hard for the consolidation of mathematics and hard science education for the purpose of boosting science and technology in the country. As a result of this motive the Ministry of science and technology is highly emphasized on hard science and Mathematics education since they are a base for science and technology. Even it has its own rules and regulation to encourage problem solving research work in mathematics and hard science together with giving prize to high scoring students in those areas. As a result of this activity of the Ministry in relation to the two subjects, they become part of this study. See appendix 4.

4.2 Relevance and Quality of research undertaken by postgraduate students.

Research relevance and quality are interdependent to each other. In order to improve research utilization status, identifying the status of relevance and quality of research would be very crucial. That is why this study mainly concerned to determine the relevance and quality of research undertaken by postgraduate students.

4.2.1 Relevance status of research undertaken by postgraduate (Master's) students at AAU.

(Source- the content analysis**)**

In this study, the researcher has set three criteria's to review the content of all the research papers undertaken by postgraduate (Master's) students of mathematics and physics education in terms of their relevance. The criterion includes Academic matters, national educational policies and their relevance to the need of the society.

I. **Academic matters**.

(Source- the content analysis**)**

The researcher made content analysis of all those research papers (88 of them) undertaken by postgraduate (Master's) students in the years from 2009 to 2011 in terms of their relevance to academic matters such as teaching/learning, knowledge creation, curriculum development and its implementation status. The content analysis results showed that, all the research papers are entirely relevant to the issues of teaching/learning, the development of curriculum and its implementation status. As a result of this content analysis findings showed that all the topics entertained by postgraduate students were entirely relevant to the academic matters such as teaching/learning, curriculum development and reviewing the status of their implementation in to action.

II. **National education policies.**

(Source- the content analysis**)**

The second criterion for reviewing the status for relevance of research papers undertaken by Master's students of Mathematics and Physics education in the years from 2009 to 2011 was in association of national educational policies in general and 70: 30 national educational policy in particular. Almost all the research papers were reviewed by observing their titles and its coverage. Based on the data obtained from the content analysis of this study, the research papers undertaken by postgraduate (Master's) students in the years from 2009 to 2011 showed that, no research papers found to be relevant to any national educational policies in general and 70:30 national educational policy in particular. Even if in the research thematic areas of both departments, educational policy was one of their thematic areas, but the data that was found practically in the content analysis of this study showed that, no research was undertaken to address this thematic area.

III. The need of the society.

(Source- the content analysis**)**

The third criterion for reviewing the status for relevance of research papers undertaken by Master's students of Mathematics and Physics education was in association of addressing the need of the society. Almost all the research papers were reviewed. The content analysis data of this study showed that, none of those research papers were found to be relevant to the need of societal related issues. So as a result of this data that, their relevance to the demand of the society was not fulfilled or they were not relevant at all. Even if in the research thematic areas of both departments, societal need was one of their thematic areas, but the data that was found practically in the content analysis of this study showed that, no research was undertaken to address this thematic area.

4.2.2 Quality status of research undertaken by postgraduate students at AAU.

(Source- the content analysis**)**

Similarly the content analysis was made also to identify the status of research undertaken by postgraduate (Master's) students. To review the analysis work the researcher has set five criterions that were associated to the issue of research quality. The criterion includes something related to methodological aspect. Among the methodological aspect, the following area would be reviewed.

A). Research designs and Methods
b). Sample size and its validity
c). Reliability of Data
d). the use of data quality assurance
e). Topic similarity and its implication.

The total number of research papers (Master's theses) undertaken by postgraduate (Master's) students in the years from 2009 to 2011 were 88. The sample size that was taken from the total of 88 research papers Master's theses) were drawn 40% from each of physics and Mathematics department (17 from physics and 18 from Mathematics in total 35 research papers in number) and analyzed using inferential statistics for quantitative data's and both

thematic as well as comparative technique of analysis were used for qualitative data's. The data analysis data showed that, most of them have quality related problems or their status in terms of quality was very poor. To justify this generalization, let us discuss some of the problems identified by this study and how it affected the quality status of the research papers.

A) **Design and Method**

Generally applying appropriate design in any research can minimise bias and maximises the reliability and validity of the study. That is why one of the criterions for reviewing research quality was the appropriate application of research design and method by those students under this study. Based on the content analysis data of this study showed that, 60% of the researchers (21 of the research papers from the total 35 research papers) adopted mixed research design. Mixed research design was very good for many research topics as it helps for collecting but when we come to the application of the design they adopted, they had a problem since their design did not concede with the nature of mixed method design. The content reviewed data showed that, the design they selected did not consider the following facts.

i. The level of interaction between the quantitative and qualitative strands
ii. The priority of the strands
iii. The timing of the strands
iv. Where and how to mix the strands because the design they adopted did not raise such issues. Since descriptive survey design they adopted did not respond to the above crucial issues. This was one observed fact as the content analysis data of this study showed.

The second dominant methods to be adopted by 35% of the researchers (14 research papers from 35 sample papers) were quasi experimental ones. Even if Quasi experimental has an advantage using in educational research since it can be applied in groups in the existing setting. But when we come to the data obtained from the content reviewed by this study showed that, their application of this design had a problem in managing internal artefact and biases.

Prior to administering the intervention, the researchers should establishes a stable baseline of information, repeatedly and frequently measures behaviours and record scores for each individual. After administering the intervention, the researcher should notes the patterns of behaviour and plots them on a graph. Data obtained from the content analysis of this study

showed that, absence of all these situations or inappropriately doing all these processes. As a result of this data, any change after the interventions cannot be confirmed either due to the intervention or due to the threat. This was the other factors that could be observed problem in relation to the quality status of those research papers undertaken using this method.

B) **Sample size and its validity.**

The second criterion for reviewing research quality was the appropriate application of appropriate usage of sample size and the status of external validity (sample size representativeness) of the research papers under study. According to Creswell (2012) the size of the sample should be neither excessively large nor too small. It should be optimum. An optimum sample is one that fulfils the requirements of efficiency and representativeness Creswell further noted that, a research having an optimum sample size can ensure generalizability of the findings to the entire population.

The content analysis data of this study showed that, the sample sizes of most researchers do not fulfil the above criteria such as validity and representativeness of the entire population. Let us mention some practical examples from the sample research papers as follow.

a. The title of the research was **Evaluation of the implementation of grade 10 Geometry secondary schools of Mekelle town.** There were four government secondary schools in the town but the researcher took three of them, this was very good. But Out of the total grade 10 students around 2517, the researcher took only 300(11.9%). This sample could not be valid since it was very small to represent the total population. This was one example.

b. The title of the research was **school-based factors affecting the quality of physics education in preparatory schools of Addis Ababa**. Based on the title of this research topic, the subject of the study should be all preparatory schools in Addis Ababa city. The researcher randomly drew four sub cities as sample of the total population out of ten sub cities of Addis Ababa city government. The four preparatory school of the government only considered by the researcher as the subject of the study. Out of the four preparatory schools, again 400 students were drawn by the researcher as the final sample size of the study. The sample size was very small, let alone for all preparatory schools of Addis Ababa even for the four schools themselves, 400 students mean 8% of the total number of four preparatory schools. The sample was too small to represent the total population. Based on the

above sample size, the findings of the study have no reliability as well as validity. In all forms of research design, if the sample size is inappropriate to represent the entire population, the findings of such study cannot be generalized to the total population, for other condition as well as time.

NB. In this study, I used 40% as a sample size of the study i.e. 17 research papers from out of 43 Physics research papers and again 18 research papers out of 45 Mathematics research papers. Totally 35 research papers were drawn as a sample size of the study from 88 research papers of the two departments in the years from 2009 to 2011. So the sample size is optimal. It could represent the entire population (88 research papers). There was no problem in relation to representativeness of the data obtained from this content analysis as well as the findings of the study to be generalizability to the rest of the research papers of the two departments.

C) **Reliability of data**

The third criterion for reviewing the quality status of research undertaken by postgraduate (Master's) students was reliability of the application of data collection instrument since inappropriate application of data collection instrument affect the trustworthiness of the data obtained in such process. They used different data collection instruments like questionnaires, interview, observation and others but the data obtained as a result of the content reviewed work of this study showed that some of the researchers did not apply those instruments. Some of the shortcoming in association of their application of data collection process was summarized as follow.

Questionnaire

Questionnaires are one of data collection instrument for researchers to conduct research. Most questionnaires should be properly organized to the respondents in easy and simple language. There must be correlation between research questions and the questionnaires so as to collect relevant data to their study. In this regard the content analysis data showed that different problems were observed. Let us discuss some of the problem observed to the questionnaire of some researchers as follows.

- Some of the questionnaires did not concede with the basic questions or research questions. Even though the main objective of this data collection tool is to respond the research questions but in practice there is no proper linkage between the

questionnaire and the research question. Let us see some of the problem practically occurred using example as follow.

The title of the thesis was- **The effect of peer instruction teaching/learning method on conceptual understanding of secondary school students (2011).**

The research questions were the following-

1. What was the effect of peer instruction teaching/learning method on students' conceptual understanding of mechanics?
2. Did peer instruction method of teaching/learning feasible in large classes (in Ethiopian context)?
3. What was the effect of peer instruction teaching/learning method to female students in their conceptual understanding, achievement and their level of class room participation?

Those research questions did not concede with the questionnaire. The questionnaire has 10 questions in total and out of those 10 questions, only nine of them purely dedicated for the research questions. But one research question (question number 3) was totally ignored or was not entertained in the questionnaire but in the recommendation part the researcher gives its own recommendation without collecting any data's on it. There are other similar research papers they were poorly organized like this but for the sake of understanding this was presented. You can see in detail in Appendix-VI.

NB. In this study, the questionnaire, I used was directly relevant to the research questions of the study. In order to be sure of the relevance of the research questions and the questionnaire the draft of the questionnaire was modified many times using the comments collected from many relevant individuals such as the future respondent of the study as well as some research researchers.

Observation

The data obtained as a result of the content analysis of this study showed that, most researchers were undertaken their observation work during their thesis work in the place and the people where they were familiar. According to Kothari (2004) that, data collected using the observation process with in this condition has a reliability problem. This happened as a result of the following reasons taken from the data obtained from the content analysis of this study and paraphrased ideas from Kothari (2004) would be summarized as follow.

- Since mostly the participants of the study and the researchers knew each others as a result of this situation, the participants had the possibility of showing their nominal behaviour. So the outcome of the observation data would be unreliable.
- In some of the researchers, it was not clear whether they did follow the normal procedure and their use of checklist for their observation or not because some of them did not mentioned anything in relation to such condition in their papers whereas some of the researchers used checklist during their observation and their checklist was directly relevant to their research question as well as they attached it in their appendix too.

NB. In this study observation was not used as means of data collection instrument since this study entirely dependent on document analysis.

D) Data Quality Assurance

The fourth criterion for reviewing the quality status of research undertaken by postgraduate (Master's) students was the use of data quality assurance. According to Manfred, E & Thomas, k (2007) would be summarized as follow. Data quality assurance is the other important tool to secure the reliability of data's. Data can be contaminated before, during and after the collection process. If the data collection instruments were not properly organized in terms of language clarity, concept relevance, concept understanding by respondents and the like make the data either relevant or irrelevant to the research questions. Based on the above concepts the content analysis data of this study showed that some researchers adopted data quality assurance whereas others totally ignored the issue of data quality assurance. As a result of the absence of this activity, it was difficult for them to minimize some of the errors that occurred during each of data collection process. This situation affected the trustworthiness of their data and their findings as well.

NB. In this study, I used data quality assurance before data collection (during the formulation of the questionnaire and interview questions), during data collection using both instruments and during the analysis work too. This was done precisely to prevent data contamination.

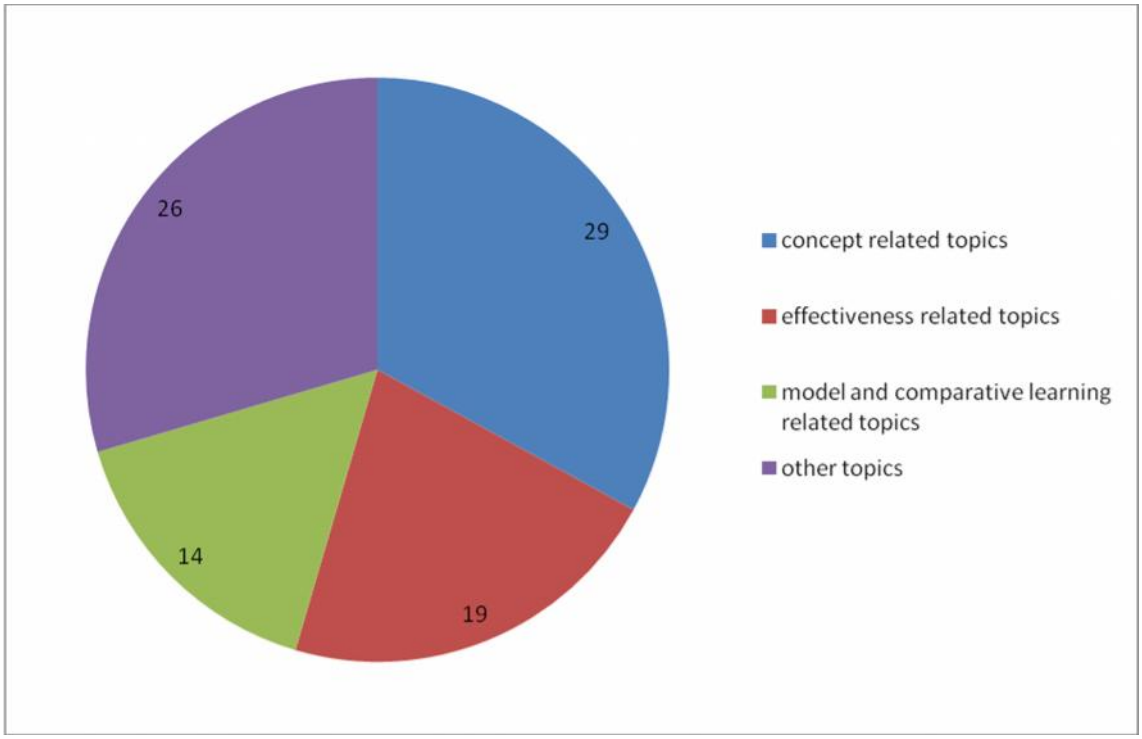
E) Topic similarity and its implication

The fifth criterion for reviewing the quality status of research undertaken by postgraduate (Master's) students was the use of similar topics only with the change of place and time.

Based on the data obtained from the content analysis of this study showed that, there was topic similarity with time and place difference. According to the data obtained from this content analysis or content reviewed work on research undertaken by Master's students showed that, most researchers preferred to do the topics that was already done by somebody before them. For example Effects of peer instruction on students' conceptual understanding of mechanics this topic was done in southern region. In the next time this topics was repeated with a little modification like conceptual understanding of Mechanics would be changed to the conceptual understanding of heat, thermodynamics etc. But the data obtained from the content analysis of this study showed that, the whole of the research process like data collection instruments, the design adopted, their application as well as the shortcoming appeared in one researcher would be repeated with no difference from the previous researcher. Based on the data obtained from the content analysis showed that, there was a problem of research work originality. This situation was the other form of plagiarism as it was confirmed by the data of this study.

Among the factors that affected research quality was the absence of research work originality as it was identified by Tariq (2011). Based on the content analysis data of this study, those topics considered as similar would be categorised in to three groups and summarized as follow using the pie-bar as follow.

Fig 1. Shows that percentage of topic similarity from the years 2009 to 2011



Based on the above figure, Concept related topics (the concept of heat, the concept of Mechanics, the concept of Electricity, the concept of Magnetism etc.) were 29 in total, out of 88 research papers in the years from 2009 to 2011. When this figure was changed in to percentile, it covered nearly 33% from the total topics undertaken in the years from 2009 to 2011. The other dominant topics were effectiveness related ones (Effectiveness of inductiveness thinking Model, effectiveness of Analogy learning model, effectiveness of teaching by inquiry training Model, effectiveness of teaching mathematical concept by inductiveness-inductiveness Model etc), in this group 19 research topics were categorized and When this figure was changed in to percentile it covered nearly 22%. The third dominant topics were comparative learning related topic using model (such as Comparative Study of the effectiveness of group discussion and project method, comparative Study of learning Misconception of Trigonometric function, Comparative study of Classical lecture based instruction etc.) . The total topics under this group were 14 in number. When this figure was changed in to percentile, it covered 16%. The rest of the topics were different ones and

possibly not associated to each other like the above topics were 26 in number, When this figure was changed in to percentile nearly it covered 29.4% only.

Based on the data obtained from the analysis work of this study showed that, a few topics were dominant. The three groups covered above 70%. According to the data from the content analysis or content reviewed process of this study, non similar topics were less than 30 %. According to the data obtained from the content analysis of this study showed that, Except nominal difference like the concept of heat with the concept of Mechanics and region or place difference the rest of their research process including the short coming of the previous researchers were repeated. For example collecting data using observation without the use of checklist, applying mixed research design but as far as which data was collected first, priority of which data comes first and second and how they undertook their analysis was not outlined in their research papers.

Table- 2 shows that distribution of topic similarity across each year.

Topics	2009	2010	2011
Concept related	4	12	13
Effectiveness related topics	3	6	10
Comparative learning	7	4	3
Others	10	8	8

Based on the data obtained from the content analysis of this study showed that, For example concept related topics as well as effectiveness related topics were showing the tendency of increasing from the year 2009 to 2011 as it was clearly outlined in the above table. The other dominant topic (comparative learning using model) was showing the tendency of decreasing from 2009 to 2011. Similarly those different topics were also showing the tendency to decline from 2009 to 2011.

NB. As far as this study originality is concerned there was no any research undertaken before in assessing or reviewing the status of research conducted by Master's level in terms of relevance and quality. Therefore this is the first work.

The summary of the analysis of Data collected from the questionnaire and the interview using the bar graph as follow.

Q1= relevance and quality status of research undertaken by postgraduate students.

Q2= regarding the contribution of research undertaken by postgraduate students.

Q3= rule or regulation or system effectiveness to ensure relevance and quality.

Q4= the role of stakeholders to ensure relevance and quality of research.

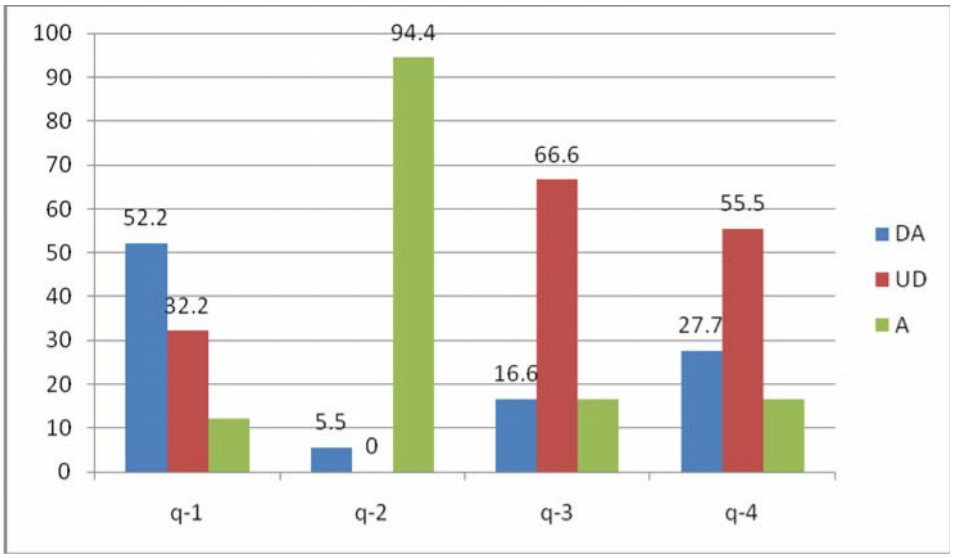
NB. In this study symbols like A, UD and DA have the following meanings.

Both Agree and strongly agree combined in to one term that is **A**.

Both disagree and strongly disagree also combined in to one that is **Disagree**.

UD represent undecided or in other word it means I do not know.

Fig. 3. Shows about the data analysis from the questionnaire and interview



Based on the data shown by the above bar graph, the status of research undertaken by postgraduate (Master's) students in terms of their relevance and quality (above 52%) concluded that research undertaken by Master's students were not relevant and quality ones.

Regarding the contribution of research undertaken by postgraduate (Master's) students were concerned, as the above data showed that, 94.5 % of the respondents were agreed that research undertaken by Master's students have a contribution. Regarding the effectiveness of the rule and regulation of departments and the university quality auditing activity in relation to ensuring research relevance and quality was concerned as it was seen from bar graph, 66.6% of the respondents were undecided. From this we could say that both the rules and the regulation of the university was either unknown to them or its effectiveness was very weak to show practical change to them.

The stakeholder's role for ensuring relevance and quality of research undertaken by postgraduate (Master's) students were concerned; most of the respondents (55.5%) were undecided. This means that, within the research work of the university, stakeholder's role was either unknown or their involvement was very limited.

4.3 Factors that influence the relevance and quality status of research undertaken by postgraduate (Master's) students.

(Source of data was -the content analysis, questionnaire and interview)

Based on the findings from the analysis work of this study showed that, research undertaken by postgraduate (Master's) students are poor in terms of their relevance and quality ones. The factors affecting relevance and quality of research undertaken by postgraduate students would be mentioned as follow.

- **Lack of adequate funding**. Most postgraduate (Master's) students did not have sufficient finance to undertake their research. Even this lack of adequate funding seriously affected the relevance and quality of research. In all research papers covered by the analysis of work of this study showed that, among the factors mentioned as a limitation of their study was lack of finance took the dominant position. The data obtained from the analysis of the interview as well as the questionnaire also confirmed that, inadequate funding affected the relevance and quality of research at postgraduate (Master's) level.

- **The quality of the supervisors and their advisement**. According to the university guideline for thesis writing, examination and grading guideline, thesis advisors oversees the research undertakings of graduate students in a manner generally set out through the practices and traditions of their disciplines and academic departments. Advisors should be available to students on a reasonable basis for consultation and discussion of thesis progress and issues related to research. Again it notified that graduate students have the right to change their advisors if they have rational ground. This may include their research topics and their advisors background is different.

  In similar development according to Ismail and Abiddin, the role of research supervisors would be outlined as follows. Supervision is concerned with the mechanism of ensuring that student make good progress towards completion (Hockey, 1996). On the other hand, the supervision literature indicate that ethical, technical and methodological problems can be minimized or prevented if all the participants in the relationship strive to enter it with clear expectations for their respective roles (Ismail and Abiddin (2009).

Despite what was underlined supposed to be done in both sides, according to the findings of this study, many students research work had problem related to ethical, technical and methodological problem. If research supervisors were committed to work together with their advisees, such problem could be minimized or prevented. According to the findings of this study, this might happened as a result of different factors like holding large number of advisees at a time, extra duties of the university, lack of satisfactory incentive on the behalf of the advisors or research supervisors were among the factors behind the cause for their lack of commitment.

- **Time**. Based on the findings of this study, the other factor that affected relevance and quality of research undertaken by postgraduate (Master's) students was lack of adequate time. Based on the finding of this study showed that lack of adequate time affected the relevance and quality of research undertaken by postgraduate (Master's) students.
- **University- stakeholders' linkage**. According to the data analysis results of this study showed that, the linkage between the university and its stakeholder's was confirmed to be inadequate. As a result of the data analysis of this study that the inadequate interaction of the university with its stakeholders affected the relevance and quality of research undertaken by postgraduate (Master's) students. Even the analysis data of this study was also identified that the research theme of the university was not known by the stakeholders.
- **Research skill of the candidate-** here again the analysis of data collected from the questionnaire and interview was showed that, among the other factors the affected the relevance and quality of research undertaken by postgraduate (Master's) students was the limited research skill of the candidate**.** This data was completely collected from research supervisors and research examiners of the university. So the result also showed that the perception of research supervisors as well as research examiners since students were out of the university while this research was underway.

The summary of the analysis of Data collected from the questionnaire And the interview would be shown using the bar graph as follow.

Q-11- represent linkage between the university and its stakeholders.

Q- 12&17- represents influence of linkage between the university and its stakeholders' for research relevance and quality.

Q-14- represent the influence of supervisors for relevance and quality of research.

Q-15- represent lack of adequate fund for relevance and quality of research.

Q-16- represent impact of research instructor's quality for relevance and quality of research.

Q- 18- represent the impact of the lack of time for research relevance and quality.

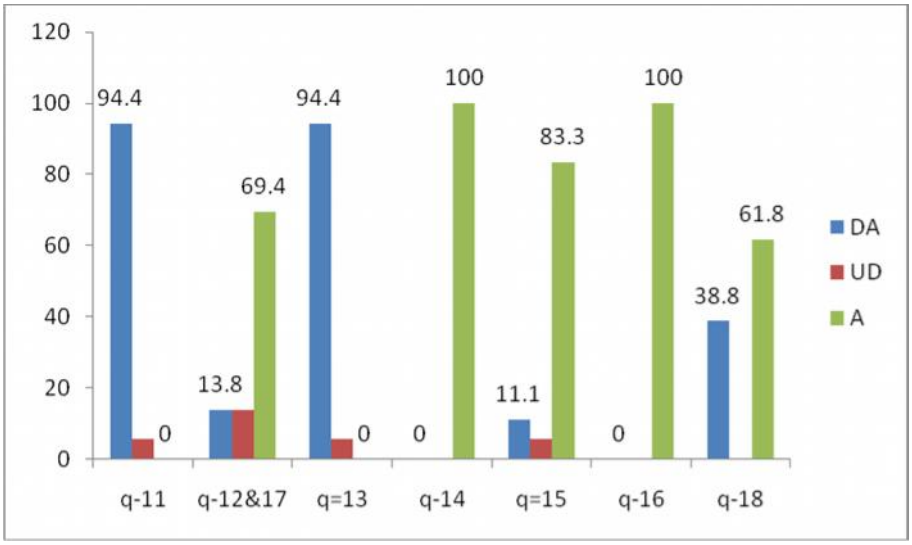
NB. In this study symbols like A, UD and DA have the following meanings.

A - Stands for both agree and strongly agree respondents**.**

UD -stands for undecided respondents.

DA- stands for disagree and strongly disagree respondents.

Fig. 3 Shows that Factors that affected the relevance and quality of research undertaken by Master's students.



The data from the analysis of the questionnaire and the interview regarding the linkage between the university and its stakeholders was concerned, 94.4% of the respondents showed that, there was no adequate linkage between the university and its stakeholders or its research users. Regarding the impact of the existing linkage between the university and its stakeholders' for ensuring relevance and quality of research undertaken by postgraduate (Master's) students were concerned; nearly 70% of the respondents data showed that, it had an impact in the task of ensuring research relevance and quality. On the other hand regarding the role of research supervisors in ensuring research relevance and quality at Master's level was concerned (Q-14) the analysis data showed that, 100% of the respondents from the questionnaire and interview responded in favour of the positive role of supervisors. Regarding the impact of the lack of adequate funding in the task of ensuring research relevance and quality was concerned (Q-15); 83.3% of the respondents data showed that lack of adequate funding affected the relevance and quality of research undertaken by Master's students. On the other hand regarding the impact of research instructor's role for research relevance and quality was concerned (Q-16); of the respondents data showed that, 100% of the respondents responded that it had an impact on it. Regarding the role of adequate time for research relevance and quality was

concerned (Q-18); 61.8% of the respondents data showed that, lack of adequate time for their research work could affect research relevance and quality of Master's students.

4.4 Mechanism to ensure Relevance and Quality of research at postgraduate level.

4.4.1 Analysis of Rules and Regulations of the departments

Generally AAU has a rule for guiding a thesis writing, examination and grading both at doctoral and master's level. This guideline considers the thesis report on a wide ranging research program that meets accepted scholarly criteria's. Again it noted that the thesis will be made publicly available, and as widely as possible, in keeping with one of AAU's primary goal of disseminating knowledge. But the guidelines raised nothing about relevance and quality issues at least in principle.

When we come to the two department's situation, they have their own rules and regulations in order to keep relevance and quality of research undertaken by postgraduate (Master') students in line with the mission of the University. Let us assess this rules and regulations role in ensuring relevance and quality of research to the need of the academic matters, national educational policies as well as the need of the society.

I. Physics department's rule and regulation
(Source – the data obtained from the interview with physics department head and the document of the department)

The department's postgraduate committee members under the chairperson of the head of the department on 17 of January 2009 discussed to identify and decide research thematic areas of the department. After a long discussion among postgraduate committee members finally they reached a consensus that the general research domains of the department should contain the following research themes. Those identified research themes were supposed to meet the department's general goals. Those identified research thematic areas would be summarized as follow.

- Curriculum under this topics the following sub thematic areas outlined
    a) Curriculum design, development and validation
    b) Didactics, curriculum and assessment in physics education
    c) Teaching-learning physics education at all level.
    d) Students challenge in learning physics education
    e) Policies for physics teaching etc.

Every year postgraduate student's titles submitted by prospected Master's students would be evaluated based on the outlined research thematic areas of the department for approval for the beginning of their thesis work. The above thematic areas of the department would be summarized in line with the outlined criterion of this study as follow.

1. Academic issues like teaching-learning, curriculum areas.
2. Education policies.
3. Society's needs such as environment, science and technology.

For further understanding of the rules and the regulation of the department you can see appendix-V

Analysis of the rule and the regulation

Based on the data from content analysis results of this study showed that , the whole of the research papers undertaken by postgraduate(Master's) students were entirely concentrated on a few issues like teaching/learning and curriculum issues. The rest of the thematic areas outlined in the department research thematic areas were totally ignored or ineffective because the department was not enforced them to action. From the analysis data of this study showed that, underlined research thematic areas were very good in paper to address the mission of the university but as a result of the failure of the department to enforce them to action, they became an ideal rule and regulation.

II. Rules and regulation of Mathematics department

Source – (the data obtained from the interview with physics department head and the document of the department)

Like the physics department, the department of mathematics also outlined in similar process their own research thematic areas. Accordingly, the department's postgraduate committee based on the underlined thematic area (research agenda), they approved or disapproved the

topics of each postgraduate student. Generally research thematic areas of Mathematics department were the following.

1) Teaching-learning mathematics areas.
2) Curriculum development and its implementation areas.
3) Mathematics or science policies and standards.
4) Professional development of science and mathematics teacher
5) Science, mathematics and society.

The above thematic areas of Mathematics department would be summarized in line with the criterion of this study as follows.

1. Academic issues like teaching-learning, curriculum areas.
2. Education policies.
3. Society's needs such as environment, science and technology.

For further understanding of the rules and the regulation you can see appendix-IV.

Analysis of rule and the regulation of the department

Rules and regulation under research agendas of the department were expected in guiding research topics of the prospected Master's students in their research theme to be confined to the academic matters like teaching-learning, curriculum development and its implementation, science and society and policies related to mathematics and science. But as a result of the data that the data obtained from the document analysis showed that, almost all research papers were concentrated to the academic matters like teaching-learning and curriculum affairs. The other underlined thematic areas of the department were not effectively enforced into action..

4.4.2 Mechanism of ensuring relevance and quality of research undertaken by postgraduate students

(Source of data from the questionnaire and interview)

The other purpose of this study was identifying the mechanism of ensuring relevance and quality of research undertaken by postgraduate (Master's) students. As a result of this study the following mechanism was identified as you can see it in the bar graph below.

Q-19- regarding the importance of having an independent institution to regulate research Relevance and quality

Q-20- regarding the role of the University in ensuring relevance and quality of research Undertaken by Master's Students?

Q-21- regarding the role of both the university and its stakeholders in ensuring Relevance and quality of the research undertaken by Master's students

Q-22- regarding the role of the government in regulating relevance and quality of research Undertaken by Master's students

NB. In this study symbols like A, UD and DA have the following meanings.

A - Stands for both agree and strongly agree**.**

UD -stands for undecided.

DA- stands for disagree and strongly disagree.

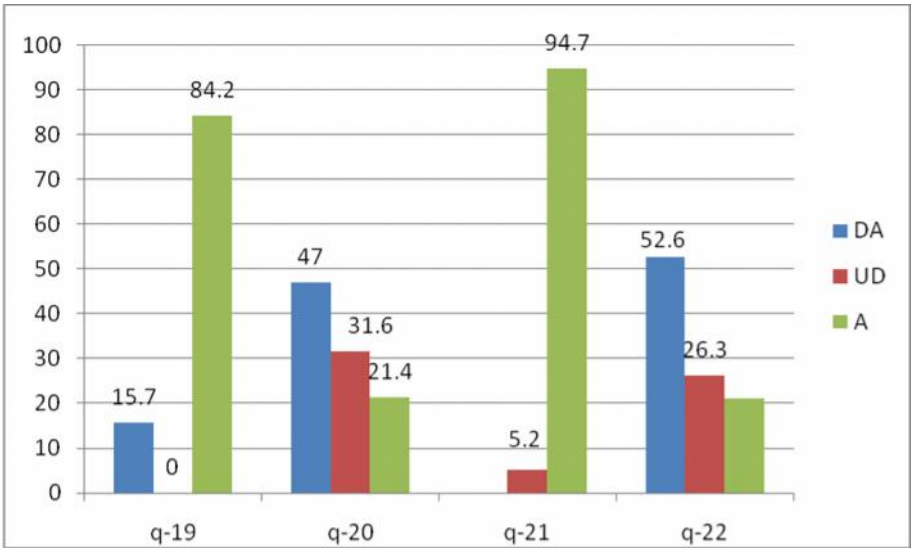


Fig. 4 shows the ways of ensuring relevance and quality of research Undertaken by Master's students of AAU

According to the data from the analysis of the questionnaire and the interview regarding The importance of having an independent institution to regulate research relevance and quality undertaken by Master's students was Concerned (Q-19); showed that, 84.2% of the respondents were responded in favour of the importance of establishing an independent institution that can regulate research relevance and quality comprising all concerning bodies. On other hand, based on the above bar graph, concerning the mechanism or ways of ensuring relevance and quality of research undertaken by postgraduate (Master's) students, 47 % of the respondents were disagree that the university alone can handle the issues of relevance and

quality of research undertaken by postgraduate (Master's) students, regarding the role of both the university and its stakeholders' was concerned (Q-20); 94.7% of the respondents were agreed that both the university and its stakeholders can handle the issue of relevance and quality of research. Regarding the importance of having an independent institution to handle the issues related to relevance and quality of research was concerned that (Q-21); 94.7% of the respondents agreed that there would be an independent institution to handle the issues. Again on the contrary to this fact regarding the role the government can play was concerned, the data analysis result showed that, the government did not have to involve in the issues of research relevance and quality.

4.5 Discussion on the Findings of this study and Related Literatures on Relevance and Quality

(Source- the findings of this study and other studies)

Addis Ababa University (AAU) is one of the oldest higher education institutions in Ethiopia and it is expected to generate new knowledge and adapt relevant knowledge to national development. Therefore, the research undertaken by postgraduate school is expected to serve the academic activities, curriculum issues, national educational policies as well as the interest of the society as a public institution.

The content analysis data of this study showed that, research undertaken by postgraduate (Master's) students in terms of relevance to the academic matters had no problem. This means that they were directly relevant to the teaching/learning activity as well curriculum related issues. The findings of this study were also similar with the following literature.

Research and teaching are said to go together in and essential, symbiotic way, leading to the Assumption that the good researcher is a good teacher, Barnett (1992). The quality of teaching is strongly related to research quality because active involvement in the research process directly improves the quality of teaching. During research academic work in role of learner and it helps them to learn new learning experiences. Research provides an opportunity to teachers to develop his/her knowledge within the discipline to develop the course and supervision (Tariq, 2011). Again on the other development, Representatives from more than twenty nations around the world (including Kenya, Ethiopia, Mali, Malawi and Liberia) focused their attention on higher education development and among three areas of research under higher education, one was related to curriculum, teaching and instructional technology (Bethwell, A &John, C.Weidman, 1993).

From the other findings (data of) the above literature and the finding of this study, we understood that research thematic areas association with the academic issues like teaching and learning, curriculum related issues as well as knowledge creation were the expected duties of universities as they stood for it.

The other finding of the content analysis of this study was in relation to identifying the status of research relevance to national educational policies in general and 70:30 national educational policy in particular. The finding (Data) of this study showed that, no research was relevant to any national educational policies in general and 70:30 educational policy in particular. But the finding of different literature showed that research and educational policies were working together for their common benefit. Let us see some of the finding of the following literature.

Governments are also recognizing the important role that research can play in policy development. For example in 1996, the Policy Research Initiative was created by the Federal Government to "develop a research Strategy for Canada to prepare for the complex public policy challenges, they are likely to face over the coming years" (Policy Research Initiative, 2001, as Cited in Steven dukeshire, 2002).

On the other similar development, the role of research for educational policies noted as follows. Research can contribute a lot for the success of educational policies. It helps also to assess the positive as well as the negative impacts of the policies after its conclusion. Using research based evidence to improve policy making and to commend it, especially as tolerance for ineffective policies and wasteful use of resources is now very low. On the policymaking side, the focus is on those civil and public servants who analyse policy possibilities and present options (sometimes accompanied by recommendations) to politicians (Ruane, 2012).
Research can play a key role for the success of educational policies through or the failure of educational policies in general. This was happened as a result of the usage of research. This usage of research could lead to identifying the challenges ahead of the implementation as well as the ways of addressing those challenges whereas the absence of the usage at the formulation of the policy ended in failure. Why such policies were failed research can identify the cause for the failure or behind the failure.

The summary of the above mentioned finding of the two literatures clearly showed that, the role research could play for the success or the failure of educational policies were very significant similarly, Addis Ababa University was also clearly outlined or emphasized the importance of doing research on national educational policies in general, but as it was practically shown from the content analysis data of this study, it was not materialized. Both the finding of the above two literature as well as AAU accepted the role of research for educational policies both in principle and practice for earlier in principle only for the later.

Similarly the third criteria for the content analysis of this study were societal need. As a result of the data obtained from this study showed that, research related to the need of the society was one of the thematic areas of the university, but no research was undertaken to address the need of the society. As the data of this study showed that, even if the AAU outlined the importance of addressing the need of the society, it was not materialized in to action. But finding of different literature showed that, consider the need of the society through its research work was one of the mission the universities as shown below.

The third key role of higher education institution was active engagement with the pressing issues of development needs and challenges of our societies. The role of higher education institutions must necessarily intersect and effectively engage with the economic and social challenges of local and national contexts. These challenges include the imperatives of economic growth and development (Badat, 2009).
According to Ethiopian education and training policy, research should be relevant to the society and research of practical societal impact will be given priority and the necessary steps will also be taken to facilitate the coordinated efforts of all those concerned (TGE, 1994).

In recent years, growing public concern about issues to do with the environment, health, economic development, and so forth, have had the effect of stimulating the expansion of knowledge production in Model 2. Growing awareness about the variety of ways in which advances in science and technology could affect the public interest has increased the numbers of groups who wish to influence the outcome of the research process (Michael, 1998.).

Summary of the above literature and the finding of this study could tell us the following concepts. Among the three cores mission of the universities were addressing the need of the society both in principle (outlining as one of their research theme) as well as practice

(changing the principle in to action). Despite being outlined in research themes of AAU, but it was not implemented in to action based as the data obtained from this study showed.

The data analysis of this study in relation to research quality was concerned, it showed that research undertaken by postgraduate (Master's) students were quality related problem. the findings of different literatures also confirmed that research undertaken by postgraduate students have quality problem. Let us summarize the findings of different literature as well as the findings of this study as follows

Nowadays the quality of postgraduate research is deteriorating as a result of many cumulative factors (Frances, R, ?). The main source from where the quality researches are evolved is the universities. The research is the discriminating factors for the university from other academic institutions but the quality of research at higher educational institutions are not satisfactory. The question mark of the quality status of research are not only for developing countries only but also it is the concern of developed countries too (Tariq, 2011).

The findings of the above literatures as well as the finding of this study would be summarized as follow. Research undertaken by postgraduate (Master's) students were concerned, they had quality related problem as it was shown by the data analysis of this study. Again the summary of the above two literature also confirmed that the quality of research undertaken by postgraduate students as well as other academic member of the university too. Since Master's students are also member of the university, the quality status of research is deteriorating not only in developing countries only but also the challenge of developed countries too.

The other data analysis result of this study showed that there were different factors affecting the relevance and quality of research undertaken by postgraduate (Master's) students. Based on the data of this study among the common factors affecting both relevance and quality of research of Master's students were concerned includes the followings.

The first factors was inadequate funding was one of the factors that affected both research relevance and quality at postgraduate (Master's) level. The findings of Different studies also confirmed this.

Among the prominent problems affecting research quality was lack of adequate funding (Mulu, 2009). Again according to the UNESCO report inadequate funding could affect the quality of research in higher education institutions (UNESCO, 2006). When postgraduate students lack adequate funding for their research work, they embarked on the research work that cost less than more (UNESCO, 2006). The finding of Ismail and Abiddin also confirmed

this fact as they put it like this. Being postgraduate students, they have a lot of challenges to overcome those challenges such as family commitment, work commitment, finance etc. which affected their achievement (Ismail, 2009). Lack of funding affected research work linkage with economic development (Mulu, 2009).

As the above literature as well as this study data confirmed inadequate funding affected both the relevance and quality of research.

The other factor identified by this study that affected relevance and quality of research undertaken by postgraduate (Master's) students were the quality their supervisors(advisors) as well as their advisement. The findings of different literature also confirmed this fac. Let us see some of them as follows.

The quality of postgraduate supervision continues to be a critical factor in the retention and timely completion of postgraduate research students, Carole and Margare (2002). The quality of research is directly or indirectly related to the quality of the research instructors, research courses, the quality of research supervisors and the facility in the university, Isani & Virk as cited in Tariq, 2011). Individual research advisors lacks uniformity in the topic they were assigned to advise by their universities and their specialization areas (university of Idaho, ?). very often the burden of heavy teaching and having large number of advisees , sometimes extra-university responsibilities keeps otherwise capable researchers from living up to their research potential (UNESCO, 2006).

Based on the above literature as well as the findings of this study also confirmed that the quality of research supervisors as well as their commitment to advise their students as they were supposed to were the factor that could affect the quality of research. Here some advisors were committed as the data of this study showed whereas others were not. So from the finding as well as from the findings of the above literature showed that we could conclude that the quality and the commitment level of supervisors could influence the relevance and quality of research.

The other factors identified by this study as a factor affecting relevance and quality of research undertaken by postgraduate (Master's) students was lack of time. The finding of this study was also confirmed by other study too.

Quality of research is defined in operational term as "the research which is completed in time (Tariq, 2011). Students undertaking postgraduate studies are under increasing pressure to complete within timeframes (Ismail and Abaddin, 2009). Good research in most areas of knowledge requires time and an effort over the long haul (UNESCO, 2006). The above

literatures as well as the finding of this study summary showed that, relevance and quality of research undertaken by postgraduate students affected as a result of time constraints associated with the quality and its relevance.

The other factors that identified by this study as a factors that affected the relevance and quality of research undertaken by postgraduate (Master's) students were, inadequate linkage between the university and its stakeholders or research users Different literature also confirmed this finding.

There is a need for developing some mechanisms of a university—industry interaction program so that academics can get ideas from practitioners on what needs to be researched and practitioners can apply the research done by the academics (Kothari, 2004). As noted by Kothari, Research undertaken by the universities were in some direction whereas the interests of the stakeholders' was in the other direction as a result of this problem, ensuring relevance and quality of research was not possible in Indian Universities.

In the UK recent policy-orientated research by Gibbs (2001) and JM Consulting (2000) indicates a failure of institutional strategies to link teaching and research effectively or at least to do this in a purposeful and explicit manner *(*Jenkins, 2005).

The above literature as well as the finding of this study summary showed that, inadequate interaction between the universities and their stakeholders affected both the relevance and quality of research.

The other factor that identified by this study as a factor that affected the relevance and quality of research undertaken by postgraduate (Master's) students were concerned limited research skill of the candidate. Let us see other literature in relation to this finding as follow.

The quality of research instructors, research course and the level of understanding among Postgraduate students are interdependent as well as the factors that affected the quality of research undertaken by postgraduate students (Ismail and Abiddin, 2009). Research skill of postgraduate students for excellent research work (Frances, R, ?).

To summarize both the above literature as well as the findings of this study that research skill of students could play a crucial role for ensuring research quality.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summery

The purpose of this study was to assess the statuses of research undertaken by postgraduate (Master's) students in terms of relevance and quality. It used mixed research method and concurrent design was employed. Data was collected using questionnaire, interview, document analysis and content analysis of research undertaken by postgraduate (Master's) students in the years from 2009 to 2011.

What was found by this study that in terms of relevance and quality of research undertaken by postgraduate (Master's) students were concerned that they had no relevance and quality. Relevance of research undertaken by Master's students was reviewed based on three criterions such as relevance to academic matters, national educational policies in general and 70:30 educational policy in particular and the need of the society. In relation to research quality was concerned it was reviewed in association of methodological aspects and originality of their research work. The findings of this study in general summarized as follow.

Relevance of research

The first purpose of this study was reviewing all researches undertaken by postgraduate (Master's) students from Physics and Mathematics education departments in the years from 2009 to 2011 in terms of relevance to academic matters, National educational policies and societal need. The analyses or the reviewing process was undertaken using the title of the research papers. The findings of the study showed that, all researches were relevant to academic matters such as teaching/learning, curriculum related issues but they had no relevance in terms of National educational policies in general and 70:30 national educational policies in particular as well as addressing the demand of the society.

As the findings of this study showed that, the three criteria outlined by the researcher to review research relevance was also underlined in the research thematic areas of the university, but as a result of ineffectiveness of those thematic areas in to action by the university, almost all the research undertaken by postgraduate (Master's) students in the year from 2009 to 2011 were not relevant to national educational policies as well as the demand of the society. As a result of the findings of this study, some of the research thematic areas of the university were not effectively enforced in to action. That was why; some of the research thematic areas had been ignored by postgraduate students to do their research work on them.

Research Quality

The other purpose of this study was to examine the quality status of research undertaken by postgraduate (Master's) students of Physics and Mathematics education departments in the years from 2009 to 2011. The participants of this study included instructors and research supervisors of Addis Ababa University, educational policy developers, Higher educational relevance and quality agency, National Curriculum developers, rule and regulation of AAU and research undertaken by postgraduate (Master's) students. Data collected from the questionnaire, interview and Documents such as research papers, rule and regulation etc. Out of 88 research papers, 40 % of them were drawn from 88 research papers (17 were taken from Physics and 18 from Mathematics research papers). The total sample size of the study was 35 research papers. All data were analyzed quantitatively and qualitatively. The findings of this study showed that the quality status of those research papers were very poor.

Among the prominent problems identified by this study as a factors affecting the quality of research papers undertaken by postgraduate (Master's) students would be summarized as follow.

- Most researchers adopted mixed research approach as well as quasi experiment but they failed to apply those design appropriately. For example in association to mixed research design they did not apply how the qualitative and quantitative data were collected, how they analyzed, how they mixed those collected other related issues. On the other hand in relation to quasi experiment they did not apply to minimize artefact and biases. This artefact and biases affected the internal validity of their findings. So this means that it affected the quality of those research papers.

- The other factors that affected the quality status of those research papers were in relation to their sample size unrepresentativeness of the total population of their study. The size of the sample should be neither excessively large nor too small. It should be optimum. An optimum sample is one which fulfils the requirements of efficiency, representativeness, reliability and validity of the findings. But in practice the findings of this study showed that, most sample sizes of the researchers were not optimum. As a result their findings could not represent the entire population of their study. In other word it did lack generalizability of its findings to the entire population (external validity problem).

- The other factors that could that affected the quality of research papers was the reliability of data. They used different data collection instruments like questionnaires, interview, observation and others but the problems that affected the reliability of data were occurred in association to their application of each data collection process through those instruments. The questionnaire of some researchers were not organized to address their research question properly and some research questions were failed to be incorporated in to their questionnaire, similar problems also appeared in their interview questions, some researchers data were collected using observation without the use of check lists etc.

- The absence of data quality assurance was the other factors that affected the quality of those research papers. Data could be contaminated when data collection instruments were designed in terms of language clarity, proper organization of the instruments with the research questions. Data could be spoiled during the collection process as a result of absence briefing before data collection or poor briefing, and misunderstanding of the intended concepts of the questions by the respondents and data could also be contaminated as a result of data encoding to the analysis process As a result of the findings of this study showed that some researchers adopted data quality assurance whereas others totally ignored the issue of data quality assurance in their study. Their ignorance of this big task eventually affected the quality of their data and their findings too.

- The final factors that affected the quality of those research papers were in association of unoriginality of their research work. The research approach they adopted, the data collection instruments they adopted, their analysis of those collected data as well as the short coming that appeared from the earlier researchers were also re appeared. Based on the findings of this study showed that there was absence of original research work among some researchers. This means that research work originality is one of the criteria for research quality.

Factors affected the relevance and quality of research undertaken by postgraduate (Master's) students.

The other purpose of this study was to examine those factors that affected the relevance and quality of those research papers under this study. As a result of the findings of the content analyses of this study showed that they were relevant to academic matters such as teaching/learning, curriculum related issues in general. But regarding their relevance to national educational policies in general and 70:30 national educational policies in particular as well as the need of the society were concerned they were not relevant at all. Despite the research thematic areas of the university included all those issues. Regarding their quality status of those research papers were concerned in general they had quality problem. Based on the findings of this study showed that, the main factors that affected the relevance and quality of research undertaken by postgraduate (Master's) students includes the following.

- **Funding-** inadequate funding affected the relevance and quality of research undertaken by postgraduate students. The university allocated some amount of money for researchers. This inadequate money was the factors behind the problem of relevance and quality of those research works.
- **The quality of the supervisors and their advisement**. Here the quality of research supervisors (mismatching of specialization areas of the supervisors to the research topics they were assigned) as well as their commitment (Advisement) to guide the researchers to the accomplishment of the research work was the other serious factors that affected relevance and quality of research work at postgraduate level.
- **Inadequate time**. Based on the findings of this study, the other factor that affected the relevance and quality of research undertaken by postgraduate (Master's) students was lack of adequate time.

- **Inadequate University - stakeholders' linkage**. The linkage between the university and its stakeholders' was inadequate. As a result of the findings of this study showed that, the inadequate interaction of the university with its stakeholders (research users) affected the relevance and quality of research undertaken by postgraduate (Master's) students. In the absence of the expected interaction between the two sides, it affected the research work relevance to the areas of research users as well as managing their quality condition too.
- **Research skill of the candidate-** among the other factors that affecting relevance and quality of research undertaken by postgraduate (Master's) students was limited research skill of the candidate**.** This was known by the content analysis of their research work as well as the data collected from the research supervisors as well as research examiners.

The analysis of rules and regulations

Addis Ababa University have its own thesis writing, examination and grading guidelines to regulate all the issues related to the format, objective of the thesis and other related issues but it did not mention anything related to how their quality status could be regulated. AAU in its postgraduate departments outlined research thematic areas based on the nature of each discipline. Their research thematic areas include academic matters, national educational policies, societal need as well as other areas. As a result of the findings of this study clearly identified that, the research thematic areas outlined by the university or by each of the department was not changed in to action, rather they remain in paper. So they were found to be ineffective.

5.2 Conclusion

The purpose of this study was to identify research undertaken by postgraduate students in terms of relevance and quality. As a result of the findings of this study showed that, all research papers did not have problem in terms of their relevance to academic matters such as teaching and learning, curriculum development and its implementation issues. Again in terms of their relevance to national educational policies as well as addressing the need of the society, they had a serious problem. The other crucial problem that identified by this study was relevance was, the quality problem. Here again the findings of this study showed that,

Most of the research papers undertaken by postgraduate (Master's) students had quality problem. The other issues that identified by this study was, those factors that affected the relevance and quality of research undertaken by this group. Based on the findings of this study showed that, lack of adequate funding, quality of the supervisors, their advisement, and inadequate time, limited research skill of the candidate and the university and its stakeholder's weak linkage were identified as the common factors. The data of the findings of this study was based on 40% of the total research papers for reviewing quality status as well as all the research papers they were undertaken in the years from 2009 to 2011 Physics and Mathematics education students for relevance assessment work. The conclusion reached here was very adequate.

5.3 Recommendation

Based on the findings of this study the researcher recommended the following issues to improve the condition of relevance and quality of research undertaken by postgraduate (Master's) students of the university.

1. The rules and regulation for research thematic areas of the university would be known or familiarized to the students before they began research topic selection process and submission to the university so as to keep their research areas in line with the research thematic areas of the university. Based on this activity the university has the possibility of enforcing those researches thematic areas in to action.
2. The roles of the stakeholders are very crucial for ensuring research relevance and quality in general. Their roles would be consolidated not only to avoid the problem of relevance and quality of research but also to create strong mutual development partnership. The stakeholders have their own problem areas that are supposed to be solved through the research activity of the university whereas the skill of undertaking research is in the hands of the university. There should memorandum of understanding between the two sides by listing areas that the research activities of the university to be emphasised and the areas where the stakeholders are expected to support the university activities. So in order to avoid both the problem of relevance and quality of research and to boost mutual development, it would be better if they work together. This was possible for example in Jomo Kenyatta University in Kenya.

3. The role of supervisors is irreplaceable and very crucial not only in the task of ensuring relevance and quality of research but also sharing their broad skill of research and research thematic areas to the young researchers. Most research supervisors' current prominent problems are lack of time to advise their advisees, extra duties of the university, large number of advisees and lack of satisfactory incentive on the behalf of the University are among the factors that affect their commitment. So the concerned body should address the problem of the supervisors so as to make them active in their duties.
4. The university should establish an independent body that can evaluate the relevance and quality of research based on the identified thematic areas of the university and as well as the interest of the stakeholders'. This independent institution that comprises both the university and stakeholders as a member so as to address their point of interest mutually like other countries experience showed us.

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Appendix I questionnaire for academic staff

ADDIS ABABA UNIVERSITY

QUESTIONNAIRE FOR ACADEMIC STAFF

INSTITUTE OF EDUCATIONAL RESEARCH

SCHOOL OF POSTGRADUATE STUDIES

Questionnaire schedule for academic staff of the university to collect information regarding the status of research undertaken at postgraduate (Master's) level in terms of their relevance and quality at AAU the case of Physics and mathematics education schools.

The purpose of this questionnaire is to gather information about the status of relevance and quality of research undertaken by postgraduate students' at the department of physics and mathematics at AAU. There is no "right" or "wrong" answer to the questions.

You are selected to complete the questionnaire as part of the sample of the target population. Please note that, your honesty in providing genuine information will make the study meaningful. You are, thus kindly requested to be honest and frank in your responses as this will have direct bearing on the success of the research.

Thank you in advance for your cooperation.

Part I General information

1. Sex: Male ☐ Female ☐
2. Academic Rank. Assist. Lecturer ☐ lecturer ☐ Assist. professor ☐ ☐ Associate professor ☐ Professor

   Others. ☐
3. Year of service: ----------
4. How many years have you served as supervisor for postgraduate students?

5. Have you served as instructor of research methods or other courses for postgraduate students?

   Yes ☐ No ☐

6. If your answer to the above question is yes how many years did you serve?
   ---

7. How do you explain the level of competence of your students in the course you taught?

8. How do you assess the existing research courses in relation to their relevance to make postgraduate students capable enough to undertake research?
   ……
   ……
   ……
   ……

PART II .

Direction Below are items related to the **relevance and quality** of research undertaken by postgraduate students at AAU? Using the scales given below please indicate your rate of satisfaction with regard to relevance and quality of research. Please Indicate the level of your satisfaction by marking ✓ .

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

	Items	SA	A	UD	DA	SDA
1	Research undertaken by postgraduate students is relevant and quality ones.					
2	Research undertaken by postgraduate students can add value in solving academic problems, Supporting national policies as well as addressing the need of the society.					
3	Research undertaken by postgraduate students are relevant to the national policy, academic issues and the need of the society					
4	Relevance and quality status of those researches undertaken by postgraduate students are very good.					
5	The rules and regulation of the university has a big role in ensuring research relevance and quality					
6	Research undertaken by postgraduate students is serving the academic and curriculum issues, national policies, as well as the need of the society.					
7	The system of research relevance and quality auditing service within the university is doing well.					
8	Research undertaken by postgraduate's students is serving the interest of the stakeholder's.					
9	All stakeholders' have a role in the task of ensuring Relevance and quality of Research.					
1	Research relevance and quality are inseparable issues.					

PART III.

Direction- Below are items related to the common factors that affect research relevance and quality at postgraduate level of physics and mathematics at AAU. Using the scales that is given below indicate your rate of satisfaction with regard to the common factors affecting research quality and research relevance. Indicate the level of satisfaction by encircling one of the following numbers.

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

o	Item	SA	A	UD	DA	SDA
1	There is no linkage between the university and research users.					
2	The existing linkage has a role for the condition of research relevance and quality.					
3	The existing linkage between the university and research stakeholders becomes a factor for under utilization of Research.					
4	Supervisors have a big role for the condition of research quality at postgraduate level.					
5	Lack of funding has a role for research relevance and quality at postgraduate level.					
6	Teacher's quality has a role for research quality at postgraduate level.					
7	The condition of university – industry linkage is the main cause for the existing relevance and quality of research.					
8	Lack of on time curriculum revision becomes the cause for research quality at postgraduate level.					

PART IV:

Direction Below are questions related to, is there a mechanism for ensuring research relevance and quality at postgraduate level? Using the scales that is given below indicate your rate of satisfaction with regard to those concerned parties role.

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

1	There should be an independent institution that can regulate the issue of research relevance and quality at postgraduate level.	**SA**	**A**	**UD**	**D A**	**SD A**
2	The issue of research relevance and quality should be regulated by the university itself.					
3	Both the university and the stakeholders have common responsibility in regulating research relevance and quality.					
4	The public through its government should regulate the relevance and quality of research.					

PART V

Direction- Below are questions related to **what is supposed to be done** in the future in relation to improve the condition of relevance and quality of research? Therefore based on your perception and your opinion as a responsible citizen recommend what is supposed to be done?

1. In your opinion what is going to be done in keeping research relevance for national policies, solving academic problems and addressing the need of the societies.

   I. In relation relevance?

   II. In relation to Quality?

---

2. Do you think there should be regular assessment of relevance and quality at national level?

_____
_____
_____
_____
_____

4. Do you have any think to say in relation to this study?

Thank you so much for your cooperation as well as for your time!!!!!!

Appendix II questionnaire for non-academician

ADDIS ABABA UNIVERSITY

QUESTIONNAIRE FOR NON ACADEMICIAN

INSTITUTE OF EDUCATIONAL RESEARCH

SCHOOL OF POSTGRADUATE STUDIES

Questionnaire schedule for non academician such as non academic department heads and experts regarding the status of research undertaken at postgraduate (Master's) students in terms of their relevance and quality at AAU the case of Physics and mathematics education schools.

The purpose of this questionnaire is to gather information about the status of relevance and quality of research undertaken by postgraduate students' at the department of physics and mathematics at AAU. There is no "right" or "wrong" answer to the questions.

You are selected to complete the questionnaire as part of the sample of the target population. Please note that, your honesty in providing genuine information will make the study meaningful. You are, thus kindly requested to be honest and frank in your responses as this will have direct bearing on the success of the research.

Thank you in advance for your cooperation.

Part I General information

9. Sex: Male ☐ Female ☐

10. Your occupational status …….

11. Year of service: ----------

12. Do you have work related relationship with research undertaken by postgraduate schools of mathematics and physics education?

---

13. How do you promote and regulate science and mathematics education in the existing relation with the university?

14. Is there a rule or regulation that can promote science and mathematics education together with the use of research in your office?

15. How do you explain the level of competence of postgraduate students in relation to their research achievement?

16. How do you assess the existing research courses in relation to their relevance to make postgraduate students capable enough to undertake research?

……

……

PART II .

Direction Below are items related to the **relevance and quality** of research undertaken by postgraduate students at AAU? Using the scales given below please indicate your rate of satisfaction with regard to relevance and quality of research. Please Indicate the level of your satisfaction by marking ✓ .

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

no	Items	SA	A	UD	DA	SDA
1	Research undertaken by postgraduate students is relevant and quality ones.					
2	Research undertaken by postgraduate students can add value in solving academic problems, Supporting national policies as well as addressing the need of the society.					
3	Research undertaken by postgraduate students are relevant to the national policy, academic issues and the need of the society					
4	Relevance and quality status of those researches undertaken by postgraduate students are very good.					
5	The rules and regulation of the university has a big role in ensuring research relevance and quality					
6	Research undertaken by postgraduate students is serving the academic and curriculum issues, national policies, as well as the need of the society.					
	The system of research relevance and quality auditing service within the university is doing well.					
	Research undertaken by postgraduate students is serving the interest of the stakeholder's.					
	All stakeholders' have a role in the task of ensuring Relevance and quality of Research.					
	Research relevance and quality are inseparable issues.					

PART III.

Direction- Below are items related to the common factors that affect research relevance and quality at postgraduate level of physics and mathematics at AAU. Using the scales that is given below indicate your rate of satisfaction with regard to the common factors affecting research quality and research relevance. Indicate the level of satisfaction by encircling one of the following numbers.

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

no	Item	SA	A	UD	DA	SDA
1	There is no linkage between the university and research users.					
2	The existing linkage has a role for the condition of research relevance and quality.					
3	The existing linkage between the university and research stakeholders becomes a factor for under utilization of Research.					
4	Supervisors have a big role for the condition of research quality at postgraduate level.					
5	Lack of funding has a role for research relevance and quality at postgraduate level.					
6	Teacher's quality has a role for research quality at postgraduate level.					
7	The condition of university – industry linkage is the main cause for the condition of relevance and quality of research.					
8	Lack of on time curriculum revision becomes the cause for research quality at postgraduate level.					

PART IV:

Direction Below are questions related to, is there a mechanism for ensuring research relevance and quality at postgraduate level? Using the scales that is given below indicate your rate of satisfaction with regard to those concerned parties role.

SA- strongly agree **A**- agree **UD**- undecided **DA**- disagree **SDA** - strongly disagree

no.	Items	**SA**	**A**	**UD**	**DA**	**SDA**
1	There should be an independent institution that can regulate the issue of research relevance and quality at postgraduate level.					
2	The issue of research relevance and quality should be regulated by the university itself.					
3	Both the university and the stakeholders have common responsibility in regulating research relevance and quality.					
4	The public through its government should regulate the relevance and quality of research.					

PART V

Direction- Below are questions related to **what is supposed to be done** in the future in relation to improve the condition of relevance and quality of research? Therefore based on your perception and your opinion as a responsible citizen recommend what is supposed to be done?

3. In your opinion what is going to be done in keeping research relevance for national policies, solving academic problems and addressing the need of the societies.

   III. In relation relevance?

   IV. In relation to Quality?

   ---

4. Do you think there should be regular assessment of relevance and quality at national level?

   _____

   _____

   _____

   _____

   _____

4. Do you have any think to say in relation to this study?

Thank you so much for your cooperation as well as for your time!!!

Appendix III – Interview Questions

ADDIS ABABA UNIVERSITY

INSTITUTE OF EDUCATIONAL RESEARCH

SCHOOL OF POSTGRADUATE STUDIES

INTERVIEW QUESTIONS for all selected participants.

Interview schedule for faculty and department heads, research related officials as well as instructors to collect information regarding the status of research undertaken by postgraduate students in terms of their relevance and quality at AAU.

Interviewee: _____ **Date of Interview**: _____

Place: _____ **Time of Interview** ----------

Duration of Interview: _____

1. What is the status of research undertaken by postgraduate students in terms of relevance and quality at your department?
2. Do you thing research undertaken by postgraduate students are adding values in academic, educational policies as well as in addressing the demand of the society?
3. How do you assess the relevance of research undertaken by mathematics and physics postgraduate students at AAU?

4. How do you assess the quality conditions of research undertaken by postgraduate students at your department?
5. How do you assess the linkage b/n the university and its stakeholders?
6. What are the common factors that can affect the relevance and quality of research?
7. Do you think there should be a mechanism to handle this issue?
8. What are the mechanism to ensure relevance and quality of research?

Appendix IV – Mathematics Research Agenda

ADDIS ABABA UNIVERSITY

COLLEGE OF EDUCATION

DEPARTMENT OF MATHEMATICS EDUCATION

RESEARCH AGENDAS

The following should be among the agenda for possible research topics but not exclusively:

- What students learn and how they learn biology, chemistry, physics or Mathematics in the Ethiopian context ranging from pre-school up to tertiary levels of education
- Teaching and learning science(Biology, Chemistry and Physics) or Mathematics vis a-vis pedagogical content knowledge(PCK) at all levels of formal as well a none formal educational sheathings in the Ethiopian context.
- Science or mathematics education in the context of Ethiopia.
- Curriculum development and implementation in science and mathematics in Ethiopia.
- Mathematics or science policies and standards.
- Learning theories, philosophy and their implication in the teaching and learning of science and mathematics.
- Teacher education vis-a- vis science and mathematics education.
- Science, mathematics curriculum, pedagogy and technology.
- Science, mathematics and society.
- Professional development of science and mathematics teachers.
- Etc.

Appendix V – Physics Department Research Agenda

ADDIS ABABA UNIVERSITY

COLLEGE OF EDUCATION

DEPARTMENT OF PHYSICS EDUCATION

Minutes of the meeting of the department graduate Committee.

17 January 2009

Present:

Ato Mekbib Alemu	Dept. Head/chair
Ato Mesfin Tadesse	Graduate program coordinator/secretary
Ast. Prof. Shimelis Assefa	Member
W/ro Tadelech Atomssa	Member

Excused:

Dr. Techn. Desta Gebeyehu	Member

Agenda:

1. Identfitying research themes
2. Criteria for selecting thesis option
3. Co-advising
4. AOB

Call to Order:

The chair called the meeting to order at 10:30 pm in the office of the department of Physics education on Saturday, January 17, 2009.

Discussion on the Agenda items

1. Identifying the research themes

Having welcoming DGC members, the chair took up the first agenda item and emphasized the department's need to identify thematic research domains for graduate students which clearly reflect the department's overall objectives to advance Physics education as outlined in the M. ed. curriculum. He also pointed out that the department's agenda matching up with the university's research agenda which favor thematic domains carefully selected to address current issues and supported by funding organizations rather than individualized research tendencies.

Members discussed and agreed on the need to have thematic research domains under which Graduate students can do their thesis research. There was a consensus that the general research domains should contain sub themes from which students choose a research topic and which address specific problems related to secondary and post secondary Physics education.

After some discussion the following research themes which were supposed to meet the department's general goals were identified.

- **Curriculum**

    a. Physics teaching-learning

    b. Didactics, Curriculum and assessment in Physics education

    c. Policies for physics teaching etc.

- **Methodology**

    a. Physics teaching-learning

    b. Pre service and in service physics teacher training

    c. Research methodology and theoretical issues.

    d. Developing new and effective learning approaches for physics education etc.

- **Physics (education) students**

    a. Students' difficulties in the physics class room

    b. Cognitive origins of students' difficulties etc.

- **Physics Education Teachers**

    a. The role of the physics teacher in engaging physics education to the real world etc.

- **Educational Technology**

    a. Modeling in physics education

b. Multimedia in physics Teaching and Learning

c. Technology and New Approaches in physics teaching

d. Science, Technology and Environment in Physics teaching etc.

- **School of Environment**
- **Quality of physics education**

It was suggested that instructors of the Department be informed of the Committee's decision to identify thematic domains and be assigned to bring descriptions to the different research themes.

The chair and the Graduate program Coordinator were assigned to arrange a meeting with the first batch of Graduate students and discuss the department's agenda to orientate thesis researches towards the general thematic research areas.

2. Criteria for selecting thesis option

The chair noted that it is time for graduate students of the first batch to choose between the thesis and non thesis option and asked if the department should consider GPA as a criterion for selecting the thesis option. It was pointed out that such a requirement was not part of the M. ed. Curriculum and should not be seriously considered for now but may be incorporated when the curriculum is revised in the future. It was, however, pointed out that the non-thesis option would not be available for the next semester because of technical problems and it was agreed that all grades be encouraged to opt for a thesis research.

3. Co-advising

The chair reminded members that all graduate students of the department are expected to start doing their M. ed. Thesis as of the coming semester and that it is time for the department to assign advisors and co-advisors. He also told the meeting that, according to a circular letter sent to the departments, an instructor can advise at most six graduates and therefore we need to assign three advisors for the eighteen graduate students. He added that those instructors of the department who are not teaching graduate courses can be co-advisors as per article 13 (resources profile) of the M. ed. Curriculum.

It was agreed to assign three advisors (including one external) and three Co-advisors.

It was moved that Dr. Tilahun Tesfaye from the department of physics, Science Faculty, be accepted as the external advisors for he is the appropriate intellectual for advising in the areas of physics education. The motion was seconded and carried unanimously.

Another point of discussion was the load distribution for advisors. The chair mentioned that a circular was passed on May 4, 2007 (ref. AVPAA/390/99) declares that if two Advisors are assigned to advise the same graduate thesis, each receive half of the load that a single advisor would receive, that is, 1.5LEH/2= o.75LEH.

This was strongly opposed for it did not take into account the difference roles of advisors and co-advisors. After some discussions it was resolved that the load of graduate thesis advisors should be as stated in article 99.16 of AAU's senate Legislation (1.5LEH) whereas the load of co-advisors should be 1LEH. It was agreed that the department Head communicate this to the college of education and find ways of securing the 1LEH load for co-advisors.

4. AOB

Tutor Assignment

It was discussed and resolved not to hire part-time tutors for the graduate program as the department could now assign staff currently attending their PhD studies to handle tutorial classes.

Students transfer requests

The chair told the committee that a graduate student, Berhanu Masrie, has requested a transfer to the applied physics department and asked members for comments. It was noted that there is no guideline regarding the transfer of students in graduate programs except an article in the senate legislation of AAU which states that "the CGS may issue guidelines on the modalities of such transfer (article 113 sub-article 5). It was also said that even if there were guidelines it would be very hard for the department of physics education to accept this particular transfer should be effected. Following discussion, it was unanimously resolved that Berhanu's transfer request be Rejected, for lack of convincing reasons and unavailability of clear guidelines to consider and decide on cases requesting a transfer from on graduate program to another. It was also decided to attach a copy of the student's transfer request for future reference.

Adjournment

Meeting Adjourned at 12:00pm.

Chair secretary.

Appendix VI. A sample of researchers' questionnaire

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

COLLEGE OF EDUCATION

DEPARTMENT OF PHYSICS EDUCATION

A questionnaire which is filled by Grade 9 students of Goro secondary school in Adama town

Objective:- The aim of this questionnaire is to collect information for the research entitled" the effect of peer instruction teaching/learning method on conceptual understanding of secondary school students' purpose only.

The information you provided in this questionnaire is highly valuable to complete the study. Therefore, you are kindly requested to answer the following questions to the best of your effort and for your cooperation I thank you in advance.

Direction:- Do not write your name. Write only your section and sex.

1. Absolutely agree
2. Agree
3. Neutral
4. Disagree
5. Absolutely Disagree.

Section… Sex…

No.	Questions	1	2	3	4	5
1	Does peer instruction teaching/learning method is a better alternatives reaching for physics classes to learn and understand physics topics?					
2	Does peer instruction provide more comfort to students in their learning?					
3	Does peer instruction have advantage to learn and understand physics topics during the lesson?					

4	Do you agree that peer discussion on concept tests after the lecture with in a peer group provide positive effect on students' achievement and conceptual understanding?					
5	Do you agree that the number of concept tests and the time provided for peer discussion are enough?					
6	Do you think that conceptual understanding that is gaining by peer instruction/peer discussion is the same with that of understanding gaining by reading in library or at home?					
7	Do you think that understanding gained by peer discussion is different from understanding gained by reading in library or at home?					

8.Do you think that peer Instruction teaching/learning method has an advantage to promote students' conceptual understanding in physics classes?

9.From the two tests, the pre test or the post test, in which one you score good grades and in which one is less? What factors affect your grades and the less ones?

---

10. If you have additional ideas or suggestion about peer instruction, write down your ideas please.

