AUTOMOTIVE TECHNOLOGY TEACHER TRAINING CURRICULUM AT UNIVERSITY OF ELDORET, KENYA: RELEVANCE TO JOB MARKET

BY
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DECLARATION

Declaration by the student

This thesis is my original work and has not been submitted for any academic award in any institution; and shall not be reproduced in part or full, or in any format without prior written permission from the author and/or University of Eldoret.

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Declaration by Supervisors

This thesis has been submitted with our approval as the university supervisors.

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DEDICATION

I dedicate this study to Dr. Kitainge Mashtakh Kisilu the Head of Department Technology Education, University of Eldoret and Dr. Herbert Dimo School of Education Post Graduate Co-ordinator, University of Eldoret for introducing me into the field of curriculum studies.

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ABSTRACT

The purpose of this study was to evaluate the Automotive Technology teacher education curriculum offered at the University of Eldoret with a focus on the relevance of the Automotive Technology teacher education curriculum to the job market. The study facilitates university policy makers with relevant information on policies that would stimulate Technical Teacher Education to be more relevant to the job market. The main objective of the study focused on five main issues related to the Automotive Technology teacher education curriculum. These issues are the objective of education, nature of control of education quality, the training processes, the feedback mechanism, training resources and the nature in which the training system relates to its environment. This explorative case study used purposive sampling to arrive at a sample of 21 target institutions. Mixed method was used and thus questionnaires, document analysis, and observations were employed to generate data. The study utilized content analysis approach in analyzing qualitative data. Quantitative data was coded and analyzed with the aid of Statistical Package for Social Scientists (SPSS). The main findings of the study indicate that the University of Eldoret Automotive Technical teacher Education Curriculum theory content is relevant to the job market while the practical content is not relevant to the job market requirements. Further, the curriculum had failed to provide relevant curriculum materials, appropriate curriculum evaluation criteria and providing relevant linkage with the work environment. Thus, the study recommends that, the curriculum and subject purpose to be included in the curriculum and subject respectively. Further, the course subjects should be revised to match job market requirements and the university to upgrade the training facilities to match job market requirements. Conversely, the curriculum and subject evaluation criteria should be re-evaluated to suit job market demands and Technology Education Department to expeditiously address challenges facing Automotive Technology curriculum.

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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

ABET	Accreditation Board for Engineering and Technology
ATC	Automotive Technology Curriculum
CAT	Continuous Assessment Test
CDRC	Curriculum Development and Research Centre
EMIS	Electronic Management Information System
EBK	Engineers Board of Kenya
GoK	Government of Kenya
HOT	Higher Order Thinking
ICT	Information Communication Technology
ILO	International Labour Organization
KATTI	Kenya Association of Technical Training Institute
KICD	Kenya Institute of Curriculum Development
KIE	Kenya Institute of Education
KIHBS	Kenya Integrated House-hold Budget Survey
KTTC	Kenya Technical Training College
MUIE	Makerere University Institute of Education
NCCTE	National Center for Career and Technical Education
NRC	National Research Council
PMT	Power Mechanics Technology
SDR	Socially Desirable Responding
TED	Technology Education Department
TSC	Teachers Service Commission
TTC	Technical Teacher Curriculum
TTI	Technical Training Institute

TUK	Technical University of Kenya
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organization
UoE	University of Eldoret
UTD	Under the Tree Data
VVP	Vocational Voucher Project

OPERATIONAL DEFINITION OF TERMS

Curriculum: For this study curriculum represents course of subjects covered by the student teacher in their pursuit towards becoming graduate teachers.

Technical Teacher Curriculum: This refers to a curriculum that prepares teachers to teach technical subjects in technical training institutes.

Technical Teacher: This is a trainer or educator who has trained and specialized in Teaching Technical subjects. Note that the term will be used interchangeably with Technical and Vocational teacher

Relevant curriculum: Curriculum (A) is relevant to the job market (T) if it increases the likelihood of accomplishing the goal (G), which is implied by market (T)

Automotive Technology Curriculum: This refers to a curriculum that leads one to be an expert in teaching, diagnosing motor vehicle problems and servicing and repairing the automobile. This term will be used interchangeably with Power Mechanics Technology curriculum, Automotive Technology education curriculum and Automotive Technology teacher education curriculum.

Job Market: This refers to the places where the Automotive Technology graduate is expected to work. For this research it will include automotive repair and assembly industry and technical and vocational education and training institutions.

Stakeholders: In this study the term stakeholder typically refers to anyone who is interested in the welfare and success of automotive curriculum and its students, including administrators, teachers, staff members, students, parents, families,

community members, technical training institutes, industries, local business leaders, and elected officials such as school board members, and politicians.

University of Eldoret Graduates: In this study refers to trainees who graduated from Moi University on or before 2012. This is because these graduates were based in Chepkoilel campus. A campus of Moi University then, but currently the University of Eldoret.

Emotional Hook: Is a written statement that one may use to trigger emotional feelings of love, attraction, devotion and commitment towards something.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 Overview of the chapter

This chapter contains background of the study, statement of the problem, the purpose of the study, objectives of the study, research questions, justifications of the study, significance of the study, assumption of the study, the scope and limitation of the study, theoretical framework of the study, conceptual framework of the study, definitions of operational terms and summary of the chapter.

1.2 Background of the study

The Gachathi commission of 1976 reported massive unemployment among youth due to lack of employable skills. It is from 1981 that the government of Kenya came out strongly with the intension to improve the quality of graduate's skills through Technical and Vocational education (Koech, 1999: Haan, 2002). This resulted in the implementation of the government appointed Working Party for the Establishment of a Second University in Kenya report which established the Kenyan second university (Moi University) by an Act of Parliament in 1984 and the start of the 8-4-4 education system. All these efforts were aimed at improving quality and employability of the graduates through the Technical and Vocational education. Despite these efforts, the Kenyan colleges and universities have struggled to improve the quality of their Technical and Vocational graduates (Koech, 1999). A review of Technical and Vocational Education and Training (TVET) colleges' curriculum and infrastructure has become the policy of choice to achieve quality and market relevant graduates (Nyerere, 2009). The main objective of Vocational and Technical education

curriculum review is to ensure that graduates become market relevant, knowledgeable, skillful, practically proficient, and to carry out essential tasks of the job (Adiguzel & Cigdem, 2009).

In addition, the function of TVET is to enable individuals to be self-employed and contribute to the society in social and economic terms (Alkan, 1999). In Kenya TVET institutions have struggled to produce self-reliant graduates (Ferej, Kitainge & Wanyeki, 2015). This has led to the quality of TVET graduates to be at the center of the intense national debate concerning the relevance of the skills acquired to job market. Further, there is a nation-wide outcry from the employing agencies and TVET researchers concerning the skills demonstrated by TVET graduates at the point of entry to the job market (G.O.K, 2005; Kerre, 1997; Kerre, 2010; Sang, Muthaa & Mbugua, 2012, Ferej, Kitainge & Wanyeki, 2015). These indeed confirm that Technical and Vocational graduates lack competence that is demanded by the job market. Production of incompetent graduates is happening in the backdrop pressure that developing countries should spend great efforts in improving Vocational and Technical education in order to be middle level economy countries (Corbin & Reynold, 2011). Quality TVET is necessary for the rapid development of the society, quality workforce for a more powerful economy by 2030 (Saglam & Adiguzel, 2007; GOK, 2007; Corbin & Reynold, 2011).

Studies in TVET have suggested that some of the possible causes of incompetent TVET graduate are that curricula are old and out-dated, incompetent TVET teachers and lack of modernized facilities and resources in Technical and Vocational institution to support the curriculum (Sang, Muthaa, & Mbugua, 2012; Kerre, 1997; G.O.K, 2005; Ferej, Kiatinge & Wanyeki, 2015). When students leave TVET

institutions ill-prepared for the workplace, educators have commonly been indicted as having failed those students (Anderson, 2011; DeWeese, 2008; Sang, Muthaa & Mbugua, 2012; Kafu, 2011). This is an indicator that teachers play a great role in determining the quality of TVET graduates (Kafu, 2013). In Kenya, the Government and Technical Teachers Training Colleges have continued to ignore calls for improving training of TVET teachers (Kafu & Simwelo, 2015). This is evident, as from the year 2010, the government of Kenya directed efforts of improving quality of TVET graduates by upgrading engineering facilities and renewing the curriculum in the middle level TVET public institutions. Disturbingly, studies tend to indicate that the quality of graduates from TVET institutions is still poor although they reported evidence of some slight improvement (Sang, Muthaa & Mbugua, 2012; Wafula, 2012; Sabulei, 2012; Ferej, Kitainge & Wanyeki, 2015).

Asunda and Hill (2008) suggested that future development in Technology Education curricula will be influenced by changes in the social, economic, political, and technological forces shaping each and every sector of lives. Jobs in the 21st century, particularly those involving rapid changing technologies, will need team players, problem solvers, and people who are flexible and possess high levels of interaction skills (Nyerere, 2009; Asunda & Hill, 2008; Khambayat & Majumdar, 2010). Leask (2001); Ferej, Kitainge and Wanyeki (2015) recommended that these rapid technological changes illustrate the necessity for regular review of Technology Teacher Education Curricula and the need to constantly upgrade teachers' knowledge and skills.

Teaching today involves a multi-faceted work environment and demands continued professional development (Kafu, 2013). What teachers teach and what they are

prepared to teach should reflect the times in which they live in if instruction is to be effective (Asunda & Hill, 2008). This calls for continuous retraining of teachers. The U.S. Department of Education (1998) acknowledged that professional development activities serve as the bridge between where prospective and experienced educators are now and where they will need to be in order to guide all students in achieving higher standards of learning and development. Disturbingly, research tends to indicate that it is a difficult task to continuously prepare career and Technical Education Teachers (McCaslin & Parks, 2002; National Center for Career and Technical Education [NCCTE], 2001; Walter & Gray, 2002). For example, a report on the status of Career and Technical Education Teacher preparation programs by the National Center for Career and Technical Education (2001) identified discrepancies between Teacher preparation, practice, and job market requirement. Teachers often have too few opportunities to improve their knowledge and skills, and their professional development opportunities are of poor quality (NCCTE, 2001).

The difficult balancing act of what to train has always placed the field of Technology Education at a critical juncture in its history. Clark (1989) and Kerre (2010) postulated that Technology Education is in a confusing crisis, largely caused by the increasing changes that are occurring within society and technology. Further, Ritz (1992) and Axmann (2004) argues that there is much confusion in TVET about what Technology Education is and what students in Technology Education Program should be learning. The confusing crisis has led many scholars to voice different opinions on what should be done to help solve the dilemma. Kafu (2013) suggests the importance of developing a multi-faceted curriculum that depicts the versatile nature and scope of technology education. Zuga (1999), Rowell (1999) and Cajas (2000) indicate that there is great need for research to be conducted in determining efficient and cost-

effective ways to conduct TVET professional development activities that would support teachers as they continuously improve capacity to help their students become technologically literate. In addition, Asunda and Hill (2008) concluded that it is imperative to identify curricular materials and instructional practices that effectively address technology education goals.

The quality of the teacher is among the factors that influence the educational out-come (Lucas, 1972; Kafu, 2012). Well trained teachers produce quality graduates (Aduda, 2003; Boyd, Grossman, Lankford, Loeb & Wykoff, 2009; Sawchuk, 2010; Kafu, 2015). The Kenyan government seems to have realized the importance of quality TVET teachers and invested millions of shillings in training technical teachers in competence-based training short courses in China and Netherlands in the year 2012. This is a good effort for the short term but raises questions such as what about the long term? Will the government be taking all fresh Technical Teacher graduates for training in overseas countries? Is the government acknowledging the fact that the local institutions lack the capacities to supply fully baked graduates? What is the government and universities doing to solve the problem of mediocre TVET teachers (Kiptoon, 1996: Kafu, 2011)? These questions tend to indicate that although the government appreciates there is need to upgrade the quality of Technical Teachers, little effort has been put in place to address the long term solution to this problem.

To produce a quality TVET graduate it calls for a competent TVET teacher (Corbin & Reynold, 2011). Despite this knowledge, most of the approaches and efforts that have been adopted by researchers and educators to examine the root cause of poor quality graduates in TVET revolve around middle level college curriculum, middle level college staffing and middle level training infrastructure (Boyd, Grossman, Lankford,

Loeb & Wykoff, 2009; Sawchuk, 2010; Sang, Muthaa, and Mbugua, 2012; Wafula 2012; Sabulei 2012; Ferej, Kitainge & Ooko, 2012; Nyerere, 2009).

From literature review it is evident that many studies in TVET have been done on the relevance of Technical Institution Curriculum to the job market (Adiguzel & Cigdem, 2009; Saglam & Adiguzel, 2007; Corbin & Reynold, 2011). However, only a few of them have been done on the relevance of the Universities Automotive Technology Teacher Training Curriculum to Job Market. Further, it is noticeable that the few studies that have been conducted on TVET Teacher Curricula have been conducted in Europe. In Kenya, information on the relevance of Universities Automotive Technology Teacher Training Curriculum to Job Market remains an open question.

Scarcity of information on the relevance of Universities Automotive Technology Teacher Curriculum to Job Market is regrettable. The information tend to be the sort of evidence that the Kenyan government and universities management appear to need to support and redirect energies and resources to improve the quality of Technical Teacher Training. This study evaluated the relevance of University of Eldoret Automotive Technology Technical Training Curriculum to Job Market with a view to improving quality. Both the relevance of physical infrastructure and TVET curriculum to the job market was evaluated.

1.3 Statement of the problem

Automotive Technology teachers enter the job market ill-prepared “half-baked” and fails to meet job market requirements and expectations (Kerre, 2010; Kafu, 2011). Currently in Kenya, Automotive Technology graduate teachers are trained in University of Eldoret and Moi University only. Despite University of Eldoret being

one of the two universities that offer Automotive Technology Education, studies have not been done on the relevance of its curriculum to the job market. The most likely causes of ill-prepared TVET teachers at the point of entry to the job market includes lack of relevant TVET training facilities in universities, low entry behavior in TVET Teacher Training Institutions, incompetent TVET Teacher-trainers and out-dated TVET curriculum(Kafu, 2011).

A close examination of these likely causes of poor quality TVET teachers as stipulated by Kafu, (2011) reveal that they are all elements of a curriculum. This informed this study to address the problem of "half-baked" TVET teachers from the curriculum angle (Kiptoon, 1996). The study tried to contribute to the on-going debate with its central question: Is the university Automotive Technology education curriculum relevant to the job market in Kenya?

1.4 Purpose of the study

This case study was to evaluate the relevance of University of Eldoret Automotive Technology education curriculum to the job market. The study was conducted in Kenya, targeting University of Eldoret Technology Education Department curriculum and the department alumni working in Technical Training Institute within Rift-valley and Western Kenya Association of Technical Training Institutes (KATTI) regions.

1.5 Objectives of the study

Main objective

The major objective of the study was to find out the relevance of the University of Eldoret Automotive Technology curriculum to the job market.

Specific objectives

1) To evaluate the relevance of the purpose of Automotive Technology to job market requirement.
2) To determine the relevance of subjects offered in Automotive Technology to job market requirements.
3) To evaluate the relevance of Automotive Technology curriculum materials to the job market requirement.
4) To assess how teaching methods affect the relevance of Automotive Technology curriculum to job market requirement.
5) To determine the effectiveness of curriculum evaluation mechanism in ensuring relevance of Automotive Technology to the job market.
6) To find out the challenges facing effective preparation of relevant Automotive Technology graduates for the world of work.

1.6 Research questions of the study

Main research question

The major research question for the study was: "How relevant is the university's Automotive Technology Teacher Training Curriculum to the job market?"

Specific research questions

1) How relevant is the purpose of Automotive Technology to job market requirement?
2) What is the relevance of subjects offered in Automotive Technology to job market requirements?

3) Are the university Automotive Technology curriculum materials relevant to the job market?
4) How do the teaching methods affect the relevance of Automotive Technology program to job market requirement?
5) Is the Automotive Technology curriculum evaluation mechanism effective to ensuring relevance of the curriculum to the job market?
6) What are the challenges facing effective preparation of relevant Automotive Technology graduates for the world of work?

1.7 Rationale of the study

A study of the relevance of UoE Automotive Technology education curriculum to the job market is important for several reasons. That is, when you treat Technical and Vocational Training and Education as a system, teachers play the role of the control mechanism in the system. This implies that it is the teachers who greatly determine the out-put of the system. From the literature review Technical and Vocational graduates (out-put) do not meet the job market skills requirement (Ferej, Kitainge & Wanyeki, 2015). The ill-preparation of TVET teachers makes them ineffective at the point they enter the profession and that contributes to poor quality TVET graduates (Boyd, Grossman, Lankford, Loeb & Wykoff, 2009; Sawchuk, 2010). This argument and others have led to concerns regarding teachers' readiness for the workforce and calls for improving teacher preparation curriculum (Boyd et al., 2009; Kafu, 2015).

Also, demand and supply perspective are equally pertinent at the middle level of human resources and learning environments in TVET. Notably, Teacher and Instructor training, the relevance of the Teacher Education Curricula and Teaching and Training materials are also pertinent (ILO, 2010). The International Labor

Organization (ILO) report, further point out that Technical and Vocational teacher training curricula represents a weak link in the Technical training learning chain (ILO, 2010). Conversely, Axmann (2004) prophesy that if the Teacher preparation curricula remains a problem, the gap between the TVET training system and employment needs and opportunities will keep on widening when the question of "What to train?" remains unanswered. Therefore, this study purposed to unearth the knowledge of the relevance of UoE Automotive Technology education curriculum with the hope that it will form part of the solution of improving the quality of Technical Teachers Training and by extension Technical and Vocational graduates.

1.8 Significance of the study

A study of the relevance of the UoE Automotive Technology Teacher training curriculum to the job market is significant in that, firstly, it facilitates universities policy makers with relevant information to develop or improve policies. This would stimulate Technical Teacher Education to be more relevant to the job market requirements.

Secondly, the study furnishes university curriculum developers with knowledge on the strengths and weaknesses of the current teacher preparation curriculum. Importantly, the study not only point's out to curriculum developers areas for improvement but also suggests the kind of improvement that is deemed most appropriate for the curriculum to be more relevant to the job market requirements.

Thirdly, the study provides relevant information to all levels of the university administration about the current status of the Automotive Technology teacher curriculum. Since curriculum evaluation and development is a political and expensive

process this knowledge allows the university administration to plan in advance any mediation exercise that may be deemed appropriate. Conversely, information generated from the study provides the teachers of Automotive Technology at the university with the best practices that may help make Automotive Technology Technical Teacher preparation curriculum more relevant to the job market. The study also suggests areas for further research that may give important curriculum insight that may help better the field of Automotive Technology Teacher education curriculum at universities and middle level colleges.

1.9 Assumptions of the study

The study was carried out on the assumption that:

1) The researcher will get cooperation from the respondents

2) The researcher will receive correct answers from the respondents

1.10 The scope and limitations of the study

This section narrowed the study to be more specific by highlighting both the boundary of the study and the anticipated difficulties, challenges and issues that were most likely to be experienced while conducting the study and, therefore, affect out-come of the research. For convenience and clarity the two issues were handled separately.

1.10.1 Scope of the study

The focus of the study was on the relevance of UoE Automotive Technology education curriculum. The study area was restricted to the University of Eldoret which has been offering Automotive Technology Education Program since 1989 and within North Rift and Western Kenya KATTI region where many of the program

alumni are practicing. Moi University was the first university (now University of Eldoret) to offer this Program in Kenya. Also, because it was not possible to study the whole TVET Teacher preparation curriculum in one study due to expertise requirement, the study focused only on Automotive Technology curriculum for in-depth study.

1.10.2 Limitation of the study

1) There are various factors that influence the preparedness of Technical Teacher for job market. This study viewed the problem of ill-preparedness of Automotive Technology teachers from the curriculum reductionism point of view only.

2) The results of the case study do not warrant generalization out-side the field of Automotive Technology unless it is undertaken with caution by the reader.

1.11 Theoretical Frame-work

In formulating the theoretical perspective for studying the relevance of UoE Automotive Technology Teacher preparation curriculum to the job market, human capital theory provided a useful prototype. The theory was advanced by Harbison and Myers (1964) and states that education and training constitute an investment in human capital which yields future returns in form of income for the individual and a nation as a whole through enhanced productivity in the society. Human capital theory emphasizes that economic development depends on the human capital stock. Specifically, this theoretical frame-work approaches the explanation of curriculum relevance in terms of quality formal education. Relevant education is highly

instrumental and even necessary to improving the production capacity of a population (Schultz, 1971; Sakamota & Power, 1995; Psacharopoulos & Woodhall, 1997).

Human capital theory envisages accelerating economic growth via emphasizing relevant TVET education. Economic growth can be realised in the 21st century by investing on human being innate cognitive abilities. Currently in Kenya, the physical resources are already over stretched while the human population is in surplus, although, a large portion of the population lack market relevant skills. Further, the government has made it very clear its intension through its development plan to make Kenya a middle level economy by the year 2030 (GoK, 2007). National development can only be achieved by having competent teachers. It is on this basis that the study built on the foundation of human capital theory. According to Fagerland and Saha (1997), the human capital theory provides a basic justification for large expenditure on relevant curriculum. This theory then was found appropriate because it indicates the importance of education to the market and education is determined by a relevant curriculum which is in line with job market requirements (Sabulei, 2012)

1.12 Conceptual framework

The conceptual framework used for studying curriculum evaluation affects implementation of research findings. A source of great dismay to both the researchers and the educators is the difficulty encountered in trying to apply the findings of a research project (Etzioni, 1960). This consternation is particularly acute in the research specialty of curriculum since curriculum evaluators and administrators undertake studies with the fullest and sincerest intention of utilizing the resulting information (Etzioni, 1960). In most cases curriculum implementers strive to maintain the status quo (Etzioni, 1960).

In view of the implementation limitations explained above, the study is guided by a clear conceptual framework which presents the interaction among the variables as shown in figure 1. This conceptual framework helped the researcher to present findings in a clear and applicable manner to the complex reality of the curriculum.

Curriculum, in this study is viewed as a composite whole and includes the learner, teacher, teaching and learning methodologies, anticipated and unanticipated experiences and the outputs and outcomes possible within a learning institution (Kumar, 2009). The conceptual frame work was informed by Kumar (2009) model. Kumar (2009) viewed curriculum as having four elements that are in constant interaction. These elements are: purpose (goal and objectives), content or subject matter, methods and evaluation.

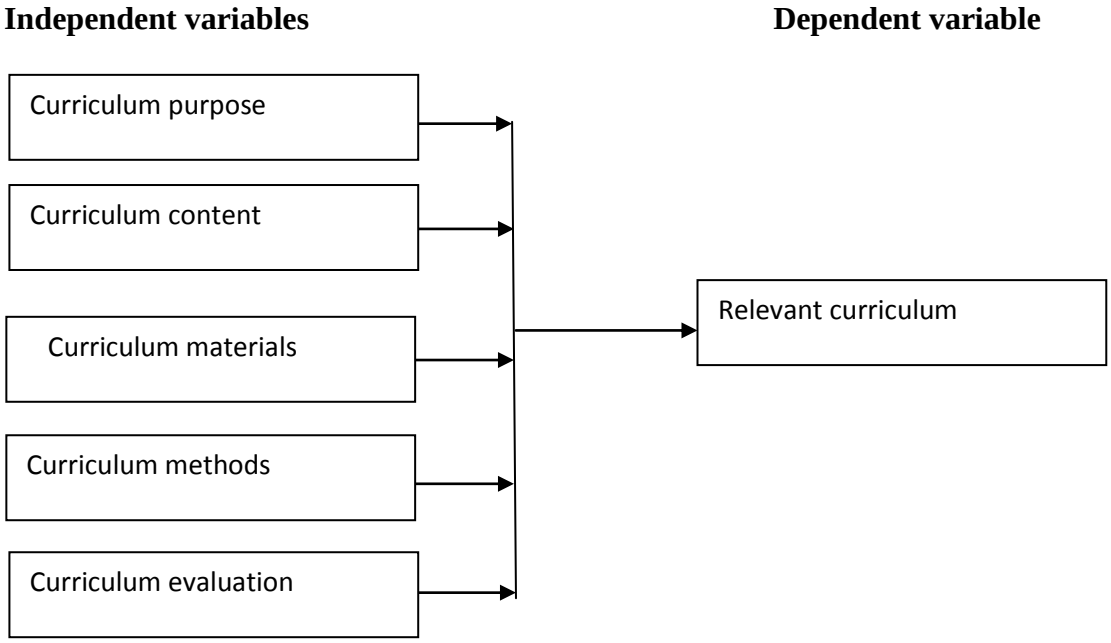

Figure 1: Conceptual framework

Figure 1 shows the relationship between independent and dependent variables in the study. The independent variables are: curriculum purpose, content, materials, methods and evaluation. In this study the purpose of the curriculum include aims of the

curriculum, philosophy of the curriculum, objectives of the curriculum, mission of the curriculum and the role of the technology education. For any curriculum to remain relevant then the purpose of the training curriculum should agree with job market requirements.

Curriculum methods include the teaching and learning strategies that power mechanics technology teachers and learners employed to attain their objectives. That is, methods in this study refer to all those activities associated with the instructions that prepare one so as to draw in a desired competence.

Curriculum content includes the subjects that are offered in Automotive Technology. Prior to developing an instructional strategy, the cognitive, affective, and psychomotor skills that are to be taught must be defined and their interrelationships specified (Daiber & LaClair, 1986).

Curriculum materials include students, instructional media, workshop facilities and laboratory. These are inputs that aid the preparation process. The nature of the inputs influences greatly the quality of the graduates.

Evaluation is the process of determining the extent to which curriculum objectives are being or have been achieved (Shiundu & Omulando, 1992). It is also from evaluation that a graduate profile is demonstrated by individual universities and this profile is what potential employers use to judge the ability of the graduate to perform (Heywood, 2005). Curriculum evaluation in the study included program evaluation, learner evaluation and the feedback mechanism evaluation.

Each of these variables has an influence on the dependent variable which is a relevant curriculum. In the study the five elements were viewed as equally necessary and

interrelated and not existing in any form of hierarchy. That is, one element will influence the dynamics of the other four elements and by extension the relevance of the curriculum.

1.13 Summary of the chapter

This chapter discussed the background of the study. The chapter also discusses the objectives and research questions of the study, significance and the conceptual framework of the study. Indeed, from the background of the study technical teachers enter the job market ill-prepared. A view supported by scholars who had established that there is a mismatch between the curriculum and the job market (Ferej, Kitainge & Wanyeki, 2015). The reason for the mismatch tend to be the sort of evidence the University of Eldoret management appear to be requiring if they are to support and redirect energies and resources to improve the quality of technical teacher training. Notably, there is no research pointing out with certainty whether UoE curriculum producing Automotive Technology technical teachers in Kenya is relevant to the job market. This established enough grounds to conduct the study on relevance of UoE Automotive Technology curriculum to job market.

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CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses two broad subsections namely general literature and related/specific literature. The main aim of literature review in this study is to locate the significance of curriculum in education, underscore job market requirements and expectations, explore the current challenges of Technical institutions and Technical teachers in Kenya, to bring to focus what has been tried before and didn't eliminate the problem completely, to trace the history of Technical Teacher education in Kenya, to trace the history of TVET curriculum evaluation in Kenya and to expose the existing gaps of knowledge.

2.2 General literature

This section discusses factors that are broadly linked to TVET education which cover the significance of curriculum in education, challenges facing technical education and past mitigation attempts of the challenges facing TVET. These aided in placing this study in the wider context of TVET in Kenya.

2.2.1 The significance of curriculum in education

Zais (1976) asserted that curriculum is used by specialists to refer to and plan for education for the youth. Education is widely seen as one of the most promising paths for youths to realize better, more productive lives and as one of the primary drivers of national economic development (Glennerster, Kremer, Mbiti & Takavarasha, 2011). The citizens and the government of Kenya have invested heavily in improving both

the access and quality of curriculum, in an effort to realize the promise of education as well as to achieve the education-related Millennium Development Goals and Vision 2030 (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Education curriculum often hinders the effectiveness of education policies enacted to address particular issues (Glewwe, Kremer & Moulin, 2009). For instance, the quality of TVET graduates has declined in recent years due to poor curriculum, outmoded training equipment's, inadequate training facilities and lack of meaningful work experience and supervision during attachment (Nyerere, 2009). This has led to the TVET graduates experiencing technological shock when they finally enter the job market. Despite the findings of Nyerere (2009) little effort has been made to establish the relevance of Automotive Technology teacher curriculum relevance to the job market. It is this lacuna that this study purposed to fill.

At a basic level, the preparation of Technology Education teachers involves three primary dimensions namely, **knowing, Doing, and Valuing** (De Miranda et al, 2009). The first three initial standards focus on **The Nature of Technology**. In addition, Technology teacher education curricula must include components that cause students to think in-depth about what is meant by technology (De Miranda et al, 2009). Madaus and Kelleghan (1992) suggested that a good curriculum should consist of six components: 1) Content 2) General objectives 3) Specific objectives 4) Curriculum materials 5) Transaction 6) Results. It is from Madaus and Kelleghan (1992) suggestion of the constituent of a relevant curriculum that the objectives of this study were developed.

2.2.2 Challenges facing Technical and Vocational education

The challenge includes staffing, fees, physical access, information, ensuring access for women and curriculum.

Staffing: Trainers are a critical component of the training requirements. The GOK (2005) emphasizes on the need for adequate staffing for the effective education at all levels of training. However, Sang, Muthaa and Mbugua (2012) concluded that shortage of TVET trainers emerged as one of the biggest challenges facing Technical Training Institutes (TTIs) in Kenya. The study further established that industrial exposure of the trainers through industrial attachments was minimal. This in itself is a weakness given that Technical Training Institute (TTI) graduates require extensive practical exposition through industrial attachments.

Fees: As with Primary and Secondary school education is a barrier to vocational training (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Although the provision of subsidies in the vocational sector has reduced the financial burden, fees is still more than Kshs 10,000 a year accounting for over 15% of average per capita house-hold expenditures from the 2005 Kenya Integrated House-hold Budget Survey (KIHBS) adjusted to 2009 prices (Kenya National Bureau of Statistics, 2005; Glennerster, Kremer, Mbiti & Takavarasha, 2011). This is reinforced by evidence from a recent randomized project in Western Kenya where close to 75% of students who were randomly awarded a voucher for vocational training (a scholarship) enrolled in a training program, while less than 5 percent of individuals who were not awarded a voucher, but were equally interested in pursuing vocational training, enrolled in a program (Glennerster, Kremer, Mbiti & Takavarasha, 2011). The high fee charged by Technical and Vocational institutions is discouraging many people from enrolling. This explains the recent low enrolment rate experienced by most Technical and Vocational training institute across the country.

Physical Access: As with secondary schools, Vocational and Technical schools are not always available nearby (Glennerster, Kremer, Mbiti & Takavarasha, 2011).

Across the country there are just over 1,600 registered Private and Public vocational centers, with public institutions accounting for 45% of the total number of institutions (Ministry of Education, 2010). The supply of vocational institutions has grown recently. Ministry of Education statistics (2010) show that, the number of public institutions grew by 7% from 2004 to 2007, while Private institutions grew by 16% over this period. This growth in part reflects the rapid growth in the demand for vocational training, where enrolments have risen by 11% over the same period (Ministry of Education statistics, 2010). Data from the Western Kenya vocational training project shows that on average approximately 23% of individuals in the study were within three kilometres of either a Public or Private vocational institution at baseline. On average there were two Public institutions within ten kilometres of the homes of the over two thousand individuals in the study (Hicks, Kremer, Mbiti & Miguel, 2011). This makes day schooling a real challenge to the Vocational and Technical education trainees.

Information: It is possible that individuals do not have an accurate view of the true returns of vocational training in Kenya. They may also be mistaken about the distribution of earnings by vocation. This assertion is supported by data from the Western Kenya vocational project Hicks, Kremer, Mbiti and Miguel (2011) which indicates that on average both men and women appear to have had somewhat optimistic perceptions of the increase in earnings associated with vocational training: they believed that the average increase in earnings associated with training was 65% higher than the estimated amount. In addition, individuals were also mistaken about the highest earning trades. This miss-information gives individuals challenges when it comes to selecting vocational careers. Also, most graduates get frustrated after graduation as the market salary rates and job specifications do not meet their

expectations. In some instances it has been reported that the frustrated graduates discourage their friends from pausing Technical and Vocational career terming it as useless (Wanyeki, 2012)

Ensuring Access for Women: Data from the 2008 Demographic and Health Survey show that 26% of women aged 20–24 had given birth by the age of 18. Furthermore, approximately a third of women were married by the age of eighteen. Marriage and fertility can prevent girls from attending vocational training courses. Indeed, data from the Western Kenya vocational training project by Hicks, Kremer, Mbiti and Miguel (2011) showed that marriage, maternity and childcare issues were the most important barrier that prevented girls who had won scholarships from enrolling in a course. Girls who had won scholarships were also more likely to cite distance as a barrier to enrolling in a course, compared to boys. This is consistent with previous research that has argued that girls schooling is more sensitive to distance than boys schooling (Alderman & King, 1998)

Curriculum: Kenya may need to adopt specific pedagogical techniques to address problems common in their schools such as large class sizes, varied education levels, family backgrounds, irregular student attendance and poorly-trained school teachers (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Current teaching methods and curricula are failing very large numbers of children who attend school regularly but learn very little. The curricula are not adapted to local challenges and needs. Too often, it presumes competencies that many of the first-generation learners do not have. Further, inflexible TVET curriculum is unresponsive to changing needs of the labour market, leading to mismatch between skills learned in training institutions and skill demands from industry (UNESCO, 2010; Nyerere, 2009). Also, TVET institutions are

managed by different government departments, making it difficult to harmonize training Programs and standards (UNESCO, 2010). This may lead to ineffective training co-ordination that may result to duplication of skilled personnel (Nyerere, 2009; UNESCO, 2010).

2.2.3 Past mitigation attempts

The government has been trying to counter the challenges facing TVET education by putting in place necessary strategies which include rethinking programs that solely increase educational inputs; curriculum reforms; education system reforms and improved data collection.

Rethinking programs that solely increase educational inputs: The government of Kenya has directed energies in staffing TVET institution. However, Glennerster, Kremer, Mbiti and Takavarasha (2011) suggests that additional resources at the school level, including more teachers per child, often have little or no detectable effect on learning outcomes unless accompanied by changes in teaching. Glennerster, Kremer, Mbiti and Takavarasha (2011) recommended that more research was needed to fully understand the complementarities between inputs and the structure of the education system. The evidence at hand showed that programs that simultaneously changed inputs and the structure of the education (curriculum) were more effective than programs that only changed inputs in isolation (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Despite this knowledge most efforts are still directed towards staffing of teachers in order to improve the TVET graduates. This revelation was the reason why the study purposed to study the relevance of Automotive Technology technical teacher preparation curriculum to the job market.

Curriculum Reform: Most curriculum reforms that have been taking place in Kenya have not been very effective in bringing the desired changes. For example, in Western Province, a randomized evaluation found that a program providing standard text-books benefited only those already performing well, suggesting that standard text-books were inappropriate for three quarters of children (Hicks, Kremer, Mbiti & Miguel, 2011). This is because paramount to all curriculum materials the teacher is key since he is the implementer of the curriculum. Therefore, devising curricula and pedagogies adapted to students needs and job market requirements should be preceded with preparing teachers to implement the curricula (Glennerster, Kremer, Mbiti & Takavarasha, 2011).

A close analysis of this intervention effort is that the government is looking at the curriculum in terms of curriculum material which is only a subsystem in the entire curriculum. It is because of this short coming, that this study purposed to address the problem of relevance of Automotive Technology teacher preparation curriculum to the job market by considering the curriculum as a whole to a void responding to the brightest light and the loudest voice.

Education system reform: Since the expanded education opportunities after independence did not result in the expected automatic employment of the Primary school leavers, in 1984 a fundamental restructuring of Kenya's education system was decided upon (Haan, 2002). Known as "8-4-4" education system (replacing the "7-4-2-3" system), it places emphasis on attitudinal and skills preparation for the world-of-work and self-employment in particular. New subjects such as woodwork, metalwork, leatherwork, tailoring and business skills, together with agriculture, home science and art, were added to the curriculum. The new system encountered problems right from

the start. These problems included hurried implementation of the system that was done without proper consultation and piloting; most schools lacked proper calibre of teachers, workshops and equipment to implement practical education; technical subjects still form only a small part (15% of learning hours) of a broad curriculum offered in Primary schools; and the curriculum appears to have been made in ignorance of the skill needs of the job market in Kenya (Oketch, 1995). These misgivings led to pupils developing a negative attitude towards Technical subjects.

The attitude of pupils to Technical education is further undermined by lack of basic facilities and qualified teachers to handle the practical subjects in most of the schools. Innovative attempts by some schools to use local craftsmen to demonstrate certain skills to the students have received negative reaction from the students who feel or believe that they know more than the local craftsmen. This has undermined the integrity of practical subjects in the eyes of the learners and the general public (Oketch, 2000). Despite this problem little effort has been put in place to address the quality of technical teachers training programs. It was because of this lacuna that the study purposed to study the relevance of Automotive Technology teacher training program curriculum to the job market.

Improved data collection by Ministry of Education: High quality data and information is crucial for designing policy initiatives and programs aimed at improving education. Basic knowledge of the diverse needs, opportunities, and challenges faced by children and parents in all corners of Kenya would go a long way to improving program design and targeting. Currently, much of the education data is collected through the Education Management Information System (EMIS). The EMIS survey is sent to all public schools and is completed by the Principals. However, it is

unclear if the Principal have incentives to misreport information, especially if they believe that such actions could influence the distribution of resources (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Research could also be used to improve the data quality (Glennerster, Kremer, Mbiti & Takavarasha, 2011). It is based on the above recommendation that this study purposed to add to the quality of collected data by investigating the relevance of Automotive Technology technical teacher preparation curriculum to the job market.

2.2.4 Technical teacher education in Kenya

In most parts of Africa, no meaningful attention has been given to the development and training of TVET teachers (ILO, 2010). Besides, due to increased technological innovations and the demand for higher education and skills in the modern workplace, much more is demanded of a TVET teacher today than ever before (Kerre, 2010).

The quality of any education system reflects on the quality of the teaching staff (Lucas, 1972; Kerre, 2010; Kafu, 2012). Similarly, the quality of any TVET system is a reflection of the quality of its TVET teachers/instructors. Until 1989, Kenya's TVET teachers were mainly Diploma holders from Kenya Technical Teachers College and the Kenya Science Teachers College in Nairobi. As a result, the TVET teachers were greatly disadvantaged because they missed out on promotions. Since then Kenya Science Teachers College has been converted to the Kenya Science Campus of University of Nairobi (Republic of Kenya, 2013)

In 1989, a department of Technology Education was established in the Faculty of Education at Moi University in Eldoret to prepare and produce graduate teachers in Technical education to teach Technical subjects in the Kenyan secondary schools and

Technical Institutions. Since then the department of technology education has produced many graduate teachers with Bachelor of Technology Education degrees and quite a number with Masters of Education degrees. The doctorate degree program was introduced in the year 2013. The Technology Education department was initially based in Moi University main campus before being relocated to Chepkoilel University campus. In 2013 Chepkoile University College was upgraded and the name changed to University of Eldoret. Currently the department still exist at University of Eldoret though Moi University have launched the same department and have made their first admission.

Although Technical teacher education across all levels has helped in developing human resource in the country, it is currently facing challenges. Among the challenges facing the Teacher preparation program include the broad curriculum that does not allow for specialization and inadequate and out-date facilities that cannot effectively prepare teachers for modern pedagogy (UNESCO, 2010); trainers lack necessary industry-based technological skills updated through industrial attachment (Nyerere, 2009); Most TVET curricula are still traditional in content and in presentation Nyerere (2009); Kerre (2010) and KTTC has shifted from its original mandate as a producer of trainers and is now competing to offer Programs similar to national polytechnics (Nyerere, 2009).

Conversely, education and industry sectors exist separately from each other. Lack of industry and school co-operation is happening while the importance of the school-to-work transition of students is being advocated. Worse, discussion of these matters has failed to probe deeper, resulting in a lack of realistic policy linking school education to the labour market (Nyerere, 2009; Ferej, Kitainge & Wanyeki, 2015).

Consequently, preparing teachers who will be responsive to a rapidly changing workplace and the global economy as a whole has become a major challenge for technology teacher educators (Asunda & Hill, 2008).

It is on the backdrop of the above observations that Kerre (2010) suggests that there is a dire need to embark on serious curricula reviews in order to effectively respond to the ever-changing demands for new knowledge and skills in the modern workplace. Despite Kerre (2010) recommendations, most of the approaches and efforts that have been adopted by researchers and educators Boyd, Grossman, Lankford, Loeb and Wykoff, (2009); Sawchuk, (2010); Sang, Muthaa, and Mbugua, (2012); Wafula, (2012); Sabulei, (2012); Ferej, Kitainge and Ooko, (2012); Nyerere, (2009) to examine the root cause of poor quality graduates in TVET have revolved around middle level college curriculum, middle level college staffing and middle level training infrastructure. It is because of these that this study purposed to address the quality of technical teachers by studying the relevance of the Automotive Technology teacher preparation curriculum to the job market.

2.2.5 Technology Teacher Education at University of Eldoret

The department of Technology Education in the School of Education was established in 1989 to produce competent graduate teachers in various technology areas of specialization for teaching in secondary schools and technical institutions. It was the only Program in Kenya of its kind before Moi University established the Programs in 2011. To-day, 24 years down the road, the graduates of this Program are widely engaged in Kenya TVET institutions and quite a good number have gone across borders supporting TVET institutions in East Africa.

The Program offers specializations in five key technology areas. These are: Building and construction technology, Mechanical Technology, Power Mechanics Technology, Electrical and Electronics technology and Computer Studies. The curriculum emphasizes the blending of practical experiences, technical expertise, and academic rigor. Students undertake coursework in general education, professional education and technology education before they graduate (Kerre, 2010). The undergraduate Program takes four years and it includes short periods of Teaching Practice and Industrial Attachment.

Since the inception of the curriculum in the department of Technology Education no research has been done to ascertain the relevance of the curriculum to the job market. This is happening despite the fact that there is a loud out-cry by researchers citing the under-preparation of teachers who are not effective at the point they enter the profession as an important contributor to poor achievement (Boyd, Grossman, Lankford, Loeb & Wykoff, 2009; Sawchuk, 2010). This formed the reason why this study purposed to explore the relevance of Automotive Technology teacher preparation curriculum to the job market.

2.2.6 History of TVET Curriculum Development in Kenya

Efforts towards systematic curriculum development in Kenya can be traced as far back as 1957. At that time, there was a need for qualitative improvement in the teaching of English, Science and Mathematics and co-ordination of Teacher Education. Special centres for these subjects were established in Nairobi beginning with the English centre in 1957. Later, between 1957 and 1962, two other centres for Science and Mathematics were established. With time, it became evident that even other curricula areas required similar attention, so the three centres were amalgamated

to form the Curriculum Development and Research Centre (CDRC) in 1964 modelled on Makerere University Institute of Education (MUIE). This centre was situated at the then Central Teacher Training College, the present location of Kenya Institute of Curriculum Development (KICD). To-day, KICD is a curriculum development and research centre which develops materials for use in education at all levels except universities. As a curriculum development and research centre, among its functions it is mandated to prepare curriculum and curriculum guides for non-degree Technical education and Teacher education programs.

The recent curriculum reform by KICD which has introduced a modular curriculum is an important step in the right direction as it provides students with greater flexibility in adapting to the job market requirements (Glennerster, Kremer, Mbiti & Takavarasha, 2011). This will help narrow the gap between college graduates and job market demand. However, mismatch between training offered at universities and skills required by the labour market UNESCO (2010) remains a paradox to be solved. This is because improving the quality of curriculum materials without improving the quality of the curriculum implementer will have little impact to the quality of the program product. It is in light of these that this study addressed the quality of technical teachers by studying the relevance of Automotive Technology technical teacher preparation curriculum to the job market.

2.2.7 Job Market Entry Behaviour

A good "national learning system" will enhance the process of human capital formation. Lall and Kraemer-Mbula (2005) recommend that a good national learning system should include raising the quantity and the quality of formal education especially at the Secondary and Tertiary education levels, increasing the focus on

technical and managerial skills, conducting a comprehensive audit of skills needs not only just at present but in the future in a more complex and competitive industrial structure, and continue such surveys on a regular basis. For instance, the government should target new skills that are likely to be critical for new technologies that provide the basis for future competitiveness (Lall & Kraemer-Mbula, 2005). This demonstrates the fact that the government needs to be concerned with the kind of academic Programs being offered in national higher education institutions especially universities (Riechi, 2008).

Overall, government run vocational training institutes in Kenya have been criticized by scholars and industrialists circles for failing to adequately provide marketable and relevant skills to students and failing to respond and adapt to a rapidly changing labour market driven by technological advances (Johanson & Adams, 2004). There is a growing sentiment that the public provision of training produces graduates with obsolete or market-irrelevant skills (Johanson & Adams, 2004). Further, Johanson and Adams (2004) argue that the TVET institutions' problems are worsened by the centralization of the vocational training curriculum which has in-turn prevented close collaborations between industry and the vocational sector in Kenya.

Although Johanson and Adams (2004) argues that teachers with sufficient work experience were critical in order to ensure that vocational training provides students with market-relevant skills. Data from the Vocational Voucher Project (VVP) in Western Kenya shows that on average instructors in vocational training schools had about only 4 years of practical experience and over 10 years of teaching experience (Glennerster, Kremer, Mbiti & Takavarasha, 2011). Further, the data shows that public school teachers have fifty percent more teaching experience than private school

teachers. With rapid technological changes, recent practical experience in industry may be a particularly important dimension of teacher quality, and one which may enhance the labour market relevance of the training program (Glennerster, Kremer, Mbiti & Takavarasha, 2011). The longer a teacher is out of the labour market the more likely their labour market experience is depreciated (Glennerster, Kremer, Mbiti & Takavarasha, 2011). This shortage of labour market experience is exacerbated by the lack of a properly educated workforce that meets the demands of the 21st century manufacturer (Judy & D'Amico, 1997).

Technical and Vocational graduates do not meet job market skills requirement. Researchers have cited the under-preparation of teachers who may not be effective at the point they enter the profession as an important contributor to poor achievement (Boyd, Grossman, Lankford, Loeb & Wykoff, 2009; Sawchuk, 2010). This argument and others have led to concerns regarding teachers' readiness for the workforce, to call for improving Teacher preparation (Boyd, Grossman, Lankford, Loed & Wyckoff, 2009). It is because of the mentioned short-coming that the study purposed to establish the relevance of Automotive Technology teacher preparation curriculum to the job market to try and solve the problem of ill-prepared technical teachers at the point of entry to the job market in Kenya.

2.3 Related/specific literature

According to Shiundu and Omulando (1992) curriculum contains three major elements: (1) Objective of the curriculum (2) The learning experience as means of achieving those objectives and (3) the evaluation process for appraising the effectiveness of the program or measuring the extent to which objectives have been achieved. Madaus and Kelleghan (1992) suggested that a good curriculum should

consist of six components: 1) Content 2) General objectives 3) Specific objectives 4) Curriculum materials 5) Transaction 6) Results. For the purpose of this study Shiundu and Omulando (1992) and Madaus and Kelleghan (1992) suggestions were integrated to come up with the five elements of the curriculum used in this study i.e. purpose (goals and objectives), content or subject matter, material, methods and evaluation. These five elements of the curriculum are what have been discussed in this section of specific literature including challenges encountered in the quest of attaining relevant curriculum.

2.3.1 Curriculum purpose

In the study the purpose of the curriculum included aims of the curriculum, philosophy of the curriculum, objectives of the curriculum, mission of the curriculum and the role of the Technology Education Department. For any curriculum to remain relevant then the purpose of the training curriculum should agree with the job market requirement (Heywood, 2000). Rono (2015) reports that technical teachers are not relevant to the job market requirement. This is why the study purposed to explore the relevance of the Automotive Technology technical teacher preparation curriculum to the job market.

Aims, mission statements and goals of the curriculum: Unfortunately, there is no agreed terminology about the use of these terms. They are often used interchangeably (Heywood, 2000; Yokomoto & Bostwick, 1999). Even the term objective may be used instead of aim or goal (Heywood, 2005). Since the curriculum is a means by which institution strive to achieve the aims of education, it is necessary to spell out those aims as first step of planning a relevant curriculum (Shiundu & Omulando,

1992). The aims of TVET as outlined in the master plan on education and training 1997-2010 (Republic of Kenya, 1998 cited by Sabulei, 2012) among other things are:

a) To inculcate the vocational and entrepreneurial skills necessary for self-employment.

b) To develop the scientific, technological, practical and attitudinal skills needed for specific jobs in various trades, vocations and professions.

c) To provide avenues for skills improvement and further training in TVET institutions.

d) To provide skilled labour to match the demand for human resources in the scientific, technological and commercial sector of the nation's economy.

One of the reasons for seeking a sharper focus is that many of the statements of aims become a pious list of platitudes that academics use when they have to defend what they do (Heywood, 2005). In fact most institutions have no means of judging whether, what they have done was achieving the goals they believed in (Heywood, 2005). It is imperative to note that one cannot plan without knowing the expected end results. Therefore, if we were to establish what academics have achieved, it would be necessary to have some criteria against which the performance of students could be judged. These criteria have to be derived from the aims that the institution has since objectives strongly control all curriculum activities.

A mission statement should be the emotional hook on which an institution hangs on. If a mission statement lacks substance the linkage between mission statement and the reality of the institution is broken (Heywood, 2005). As Nichols, J and Nichols, K (2000) wrote

> Instead of assuming' their accomplishments, institutions are being challenged to demonstrate their overall effectiveness through assessment of departmental program outcomes and objectives linked closely to the institution's statement of purpose. This requirement changes the mission statement of purpose from a shelf document with little practical use to the basis for institutional action and that is what it was intended to be (p, 13).

For a program to be relevant to the job market the mission statement has to be expanded considerably and a working relationship between the statement of purpose and the intended outcomes and objectives at departmental and program levels must be established.

The purpose of technology teacher education should be well stated. DeVore stated that the fundamental purpose for any technology teacher curriculum is to teach the knowledge and skills for individual to become technologically literate (1988). Daiber and LaClair (1986) defines an individual as technologically literate if he is able to : (1) To contribute to the improvement of society by using technology (2) To assess technology (3) To control technology (4) To adapt and adopt to a changing world and technology. The above abilities form a critical basis for the development of technology education curriculum. In a report on the role of standards as a catalyst for educational reform issued by the National Research Council (NRC), the assertion is made that significant improvement in student learning is "unlikely until teachers are educated in ways that enable them to implement and teach curricula that are consistent with the vision, goals, and content of the national standards" (NRC, 2000, p. 18). That's why this study investigated whether the purpose of Automotive Technology teacher preparation curriculum is relevant to the job market requirements.

Philosophy of the curriculum by operational, philosophy means the value system that drives a particular curriculum, syllabus, course or teaching session (Heywood, 2005). Sherren and Long (1972) operationalized that an educator must consciously program those desirable Automotive technology characteristic, behaviors having elements of influence, thought and action, which (s)he will teach before (s)he considers the creation or adoption of an instructional system. In order to know which "Automotive technology characteristics" (s)he would like to teach, (s)he must first examine the philosophy of Automotive Technology education to understand his goals and attitudes. Likewise, an understanding of the relationship between the philosophies of the student and the teacher will, allow him/her to choose a compatible educational theory which may be sensitive to the goals and attitudes of both. Sherren and Long (1972) further argued that if an educator has not examined his/her own philosophy, he/she could not be expected to examine the career goals of his/her students. Everyone teaches to his own philosophy. Sherren and Long (1972) listed four philosophies that teachers might choose to follow. These are realism, pragmatism, idealism and naturalism. Johnston et al (1995) stipulated that a philosophy of engineering (technology education) would seem to be possible, and to provide a basis for better training engineers (technology educationist) and better understanding of the roles of technology teachers and technology in our society.

Sinclair and Tilston (1979) asserts that technology education teachers needs a philosophy to answer such questions as: 1. How does technology education relate to engineering and science? 2. What is the relationship of engineering to 'technology' (as interpreted by engineers, and as interpreted by social scientists)? **3.** What is the proper field of activity for technical education technologists, as for example, as compared to that of engineers? 4. What degree of responsibility should technology

educationist take in relation to the social impact of works of technology? When technology educationists lack a philosophical base for answering such questions as these, it is virtually impossible to formulate an adequate concept of what constitutes technology education. Without such a concept, the educator is severely handicapped in developing suitable curricula in technology education. Heywood (2005) argued that philosophy has an important role to play in determining the aims of the curriculum. It is important that technology education educators formulate or adopt a philosophy of technology education that describes the context and states the rationale for the development of the curriculum (DeVore, 1988).

Early in educational experience, technology education students should be involved in developing a contemporary philosophy that is built upon an understanding of the role of TVET in meeting the needs of students and the needs of society (DeVore, 1988). This philosophy should focus on developing relevant technological literacy in all students at all levels. The philosophy should also help students appreciate the technological, social, cultural, and economic benefits for studying technology. A curriculum rationale according to Lauda and McCrory (1986) "presents assumptions about the students, the needs of the society, the nature of the subject matter, a statement of the purpose of the curriculum, identification of the data sources, and provides an outline of the subject matter to be taught" (p.32). This is why this study investigated whether the philosophy of Automotive Technology teacher preparation curriculum is relevant to the job market requirements.

2.3.2 Content or subject matter

Maintaining a strong, quality-driven technology education program begins with the preparation of competent and caring instructors (Kozak & Robb, 1991; Wright and

O'Neill, 2002). Daiber and LaClair (1986) defines an individual as technologically competent if he is able to : (1) To contribute to the improvement of society by using technology (2) To assess technology (3) To control technology (4) To adapt and adopt to a changing world and technology. The above abilities form a critical basis for the development of technology education curriculum. Prior to developing an instructional strategy, the cognitive, affective, and psychomotor skills that are to be taught must be defined and their interrelationships specified (Daiber & LaClair, 1986). If prospective technology education instructors are prepared for available jobs, then the status quo is perpetuated; if they are trained for the future they may not find relevance at the present. Therefore it is imperative that an intricate balance be found on what to train (Daiber & LaClair, 1986). This will be made possible by understating the nature of technology through the lens of philosophy of technology. The challenge facing teacher educators is to design a technology education program that is future oriented yet provides its graduates with the ability to teach technology education in the existing school environment (Kozak & Robb, 1991).

With the escalating demands toward technology-based programs at the middle level TVET institutions, major changes in teacher preparation programs are necessary to prepare teachers who have a comprehensive understanding of the content, organization, philosophy, and methodology of such a program. However, in many instances program changes at the university level are lagging behind curriculum changes taking place in the middle level colleges (Kozak & Robb, 1991). Erekson (1997) predicted that technology instructors will be required to develop competence in mathematics, sciences, computer science, computer applications, economics, labor relations, industrial psychology, sociology, history of technology, and languages. As Maley (1987) pointed out: “There is a need, as well as a challenge, to educate a new

breed of teachers who can deal with the issues related to technology education" (p. 14). This will go beyond the mere capability of teaching being doomed to the art of transferring knowledge but rebirth as the science of generating knowledge.

Technology Education Teacher Preparation Programs content should strive to serve the following purpose as delineated by (Kozak & Robb, 1991, p.139).

- Develop a personal theory. A personal theory provides future teachers a rational basis for their professional activities. Its development hopefully forces a theory that is comprehensive, internally consistent, and individually accurate.

- Use instructional technology. The use of instructional technology refers to the efficient and appropriate practice of teaching.

- Develop a value system. This is essential in a world that is based on technological development. A strong value system will help teachers view technical progress more in terms of bettering the quality of life than in simply producing something to make a profit.

- Develop a futuristic orientation. This will make it possible for future teachers to consider alternatives and make decisions regarding those alternatives if and when they become reality.

- Become independent lifelong learners. Technology education teachers need to understand the continually changing nature of the curriculum they will be teaching. Along with that understanding is the need to develop ways in which

to become continually educated about those changes, their nature, and their ability for impact.

- Develop a positive self-concept. A positive self-image will help a technology education teacher, or any teacher, succeed in the classroom (Henak & Barella, 1986).

Technology education teacher preparation program content should be based on the need for future teachers to become technologically literate and in turn, be able to develop the technological literacy of their students since change is basic to technology. Conversely, since it is agreed that change is basic to technology, then it should also be accepted that technology education is a constantly changing curriculum with certain elements periodically being eliminated and others being added (Pullias, 1987). If students are taught to-learn-how-to-learn-use, rather than how to use technological innovations, then not only will they have the direct experience but, in addition, they will be more able to transfer the learning process to technological innovations of the future (Kozak & Robb, 1991). This is so because today's students need to know not only how "staff" are produced and how to make projects from them, they also need to know how to live with this "staff", how this "staff" have become an integral part of their everyday life, and the effects this "staff" will have on their future.

'Therefore, technology education must be the preparation of people to exist in, and to relate to, a rapidly changing world. Technology educators must include all levels within the domains of learning in their teaching. Technology educators must also develop in students a cohesive philosophy of technology, and an appreciation of the interrelatedness of all technological systems (Kozak & Robb, 1991, p.145). It is

because of this that the study explored the relevance of the Automotive Technology curriculum content to the job market.

2.3.3 Curriculum materials

This phase concerns the determination of facility requirements such as structural design and utility requirements of curriculum materials and equipment. The guideline for the structural design is the Kenya basic building code. The three design issues, flexibility, safety, and quality of environment, apply in the determination of a structural design. Workshop equipment has unique characteristics such as space requirements, weight factor, stability requirements, and utility specifications. If a structure is not designed to accommodate equipment, then problems may develop. Doors, elevators, and service ramps should be designed for equipment installation, operation, and maintenance. A good designed technology education workshop should take care of the delineated objectives: (1) Philosophy of technology education, (2) Purpose of technology education, (3) Development of a curriculum rationale, (4) Preparation of a curriculum plan and (5) Completion of needs assessment.

Also identifying data sources that will be used to develop instructional materials is important. This is to make sure that the curriculum meets the demand of society and students occupational needs. The subject matter outline should identify the topics, instructional objectives, sequence of instruction, evaluation methods, and instructional strategies which will be used. Kemp and Schwaller (1988) identified six approaches to learning technology education: (1) Conceptual learning approach (2) Interdisciplinary approach (3) Social/cultural approach (4) problem solving approach (5) Integration of technology system approach and (6) Interpretation of job market approach.

The curriculum material plan provides the connection between the curriculum rationale and the actual needs of students and teachers in the school. This material plan identifies and justifies the arrangement of people, content, materials, time, space and activities directed towards attaining desired educational goals and condition (Lauda & McCrory, 1986). A properly designed workshop will assist students in the completion of instructional objectives. The designing of technology education workshop is a laborious and complex endeavor. The complexity is inherent in striking a balance between types of equipment's, facility needs, obsolete versus modern equipment and other supporting instructional materials. BrayBrooke (1986) identified flexibility (the ease with which a class environment, workshop environment, and instructional resources can be adopted/adapted to teach various subjects), safety (of students, teachers, support stuff, environmental health factor and structural soundness) and the quality of the environment (lighting, ventilation, temperature, humidity, classroom arrangement, access, drainage and appropriate furniture) as the three key factors to be considered in technology education workshop design. The purpose of identifying these issues is to provide the philosophical guidelines upon which the design occurs. A need assessment will be appointed to collect data, analyze data and prepare a need assessment report.

2.3 4 Curriculum methods

Which way to go in technology education? Do we train, teach or coach? This is the question that remains an answered. Training refers to all those activities associated with the instructions that prepare one by performing a set of activities, so as to draw in a desired competence. Training and acquisition of skills have become increasingly urgent policy issues in the industrial world. Skills developments are important for

economic growth, poverty alleviation, youth and women empowerment and social inclusion (Sabulei, 2012). Never the less, the role of TVET is absent to a large extent in most policy documents (Sabulei, 2012).

Educational aims can be achieved through raising the quality and relevance of TVET program by developing relevant curriculum methodologies and the provision of essential technologies and materials (Sabulei, 2012). Essentially, learning takes place through the experiences which the learner has, that is, through the reactions he makes to the environment in which he is placed (Tyler, 1949). It is through these experiences that the objectives can be attained (Shiundu & Omulando, 1992). Many students have been known to copy or emulate the behaviour of their teachers and fellow students. Recently, much attention has been paid to learning strategies in higher education although it seems that in engineering education more attention has been focused on learning styles (Heywood, 2005). In relation to the learning of concepts, strategies are very important, and the strategies that students employ may be strongly influenced by the instructional method and assessment procedures used (Heywood, 2000).

Marton and Saljo (1984) found that for some (students) learning is through discourse (deep leaners) and for others learning is discourse". Those who adopt the former strategy get involved in the activity while those who take the latter view allow learning to happen to them. It is this second group who are surface learners, who pay only superficial attention to the text, who are passive, who do not reflect, and who do not appreciate that understanding involves effort. Therefore, the teaching and assessment strategies used can influence the orientation that students take to deep and surface learning (Heywood, 2005). Clearly, if students are to overcome the misconceptions they have about concepts, then a deep learning approach will have to

be encouraged. In this situation a traditional lecture approach, however good the lecturer may not be adequate (Heywood, 2005).

We all have preferred ways of organizing what we see and think about or different styles of conceptualization and patterning activities Messick and Associates (1976), and these may be the most important characteristics of an individual with respect of learning (Tyler, 1978). The varied learning styles have been identified by Melton et al (1999) as sensing, intuitive, visual, verbal, inductive, deductive, active, reflective, sequential and global. For these learning styles to have great relevance the teaching methods and educational media should march the learning styles (Heywood, 2005).

Based on the view that no one theory embraces everything, Grasha (1990) took an eclectic view and considered that all theories should be examined for their potential in teaching and learning, and this is the approach taken here. A student teacher who has good master of content and conception of learning is most likely to be a good teacher. Despite this, no mention has been made of the conceptions that technology education students have of learning and the way that those conceptions influence their approaches to teaching which by extension will make them relevant to the job market. For this reason, this study seeks to establish the relevance of the teaching and learning methods in technology education to the job market.

2.3.5 Curriculum evaluation

Evaluation is the process of determining the extent to which curriculum objectives are being or have been achieved (Shiundu & Omulando, 1992). In America the Accreditation Board for Engineering and Technology (ABET) requires the institutions to say how the objectives are met, that is, measured. Thus for a particular course the

assessment criteria will be stated and tools of assessment determined that should measure against these criteria. The same function is performed by the Engineers Board of Kenya (EBK) in Kenya for engineering courses. Some of the assessment criteria will be the tools that are normally used to measure student learning.

It is also from evaluation that a graduate profile is demonstrated by individual universities and this profile is what potential employers will use to judge the ability of the graduate to perform (Heywood, 2005). A consequence of this structure is that there is no national concern for the assessment of student learning because the educational dimension of quality is vested in the individual university and the professional dimension is vested in the professional institutions acting through the Teacher's Service Commission (TSC). What is clearly left out is the role played by the Engineers Board of Kenya in maintaining quality in technical teachers since these teachers are going to train engineering courses at the diploma level. This consternation is really affecting the job prospects of the technology education students and narrowing them to classroom teaching. This is the reason why this study seeks to find out the relevance of technical teachers preparation curriculum to the job market.

2.3.6 Challenges of Today's Technical Teachers Training for the Learners of Tomorrow

In the past few years, TVET in Kenya has grown enormously, however TVET has equally encountered many challenges in recent years. A rapid development of new technologies requires engineers and technologist educators to face new situations in their working environment all the time (Khambayat & Majumdar, 2010). For example in case of computer, 50% knowledge loses its relevance within a year's time (Khambayat & Majumdar, 2010). This phenomenon is pertinent to many fields in

TVET. To-day the product life cycle has also considerably reduced. It is the job of the TVET graduate to co-ordinate the development, design and manufacture of these products in the most efficient and economic ways and ensuring quality within shorter time frame. In order to meet these emerging needs, the Technical institutions need to relentlessly modify and improve the quality of its graduates (Khambayat & Majumdar, 2010). Such diversified roles have required a new focus by TVET practitioners on reflecting on own professional practice and to acquire skills beyond the core teaching and learning competencies (Khambayat & Majumdar, 2010).

Another significant aspect is the impact of changes in ICT and The New Knowledge Economy on TVET education. These have influenced the educational environment, consequently, calling for changes in approaches to teaching and learning. The changes are also influencing teaching and learning paradigms and hence the curricula (Nyerere, 2009; Asunda & Hill, 2008; Khambayat & Majumdar, 2010). The economic restructuring brought about by globalization means the nature of skills required for the knowledge economy is a moving target, and can only be predicted at a highly aggregated level for a few years ahead (Khambayat & Majumdar, 2010).

The New Knowledge Economy demand Higher Order Thinking (HOT) skills. Higher Order Thinking involves the learning of complex judgmental skills such as critical thinking and problem solving (Khambayat & Majumdar, 2010). Higher Order Thinking is more difficult to learn or teach but also more valuable because such skills are more likely to be useable in novel situations i.e., situations other than those in which the skill was learned (Khambayat & Majumdar, 2010). Therefore, it demands a new set of skills among TVET teachers for preparing the workforce as per the rising demands of work (Khambayat & Majumdar, 2010). This essentially will demand

TVET teachers to be more aware of the rising expectations to prepare the young workforce for the changing world of work (Kafu, 2011).

2.4 Critical review

From literature review the Technical and Vocational graduates (output) do not meet the job market skills requirement. Some researchers have cited the under-preparation of teachers who may not be effective at the point they enter the profession as an important contributor to poor achievement (Boyd, Grossman, Lankford, Loeb and Wykoff, 2009; Sawchuk, 2010). This argument and others have led to concerns regarding teachers' readiness for the workforce, to calls for improving teacher preparation (Boyd, Grossman, Lankford, Loed, and Wyckoff, 2009).

To produce a quality TVET graduate it calls for a competent TVET teacher (Corbin & Reynold, 2011). Despite this knowledge, most of the approaches and efforts that have been adopted by researchers and educators as Boyd, Grossman, Lankford, Loeb and Wykoff, (2009); Sawchuk, (2010); Sang, Muthaa, and Mbugua, (2012); Wafula (2012); Sabulei (2012); Ferej, Kitainge and Ooko, (2012); Nyerere, (2009) to examine the root cause of poor quality graduates in TVET revolve around middle level college curriculum, middle level college staffing and middle level training infrastructure. Thus, mismatch between training offered at universities and skills required by the labour market remains a paradox to be solved. What researchers have omitted is to investigate whether the quality of university of Eldoret Automotive Technology teacher preparation curriculum is relevant to the job market. This is why this study purposed to establish the relevance of Automotive Technology teacher preparation program from a curriculum angle.

Conversely, since the inception of the technical teacher training curriculum in the department of Technology Education in Moi University no research has been done to ascertain the relevance of the curriculum to the job market. This is happening despite most researchers citing the under-preparation of teachers who are not effective at the point they entered the profession as an important contributor to poor achievement (Boyd, Grossman, Lankford, Loeb, and Wykoff, 2009; Kerre 2010, Sawchuk, 2010). It is on the backdrop of the above observations that the study embarked to ascertain the relevance of UoE Automotive Technology teacher preparation curricula to the job market in order to effectively respond to the ever changing demands for new knowledge and skills in the modern workplace.

2.5 Summary

Summarily, from literature review, scholars tend to agree that in the twenty-first century skills involve combining technology literacy, critical thinking, creativity and mastery of core subject matter as the lifeblood of a productive workforce in today's global, knowledge-based economy. Therefore, training providers and teachers need to be adequately equipped to deliver the same. This can be achieved by researching on our curriculum, pedagogy and andragogy to be more sensitive and responsive to technological changes while retaining it sharpness to business needs.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This section deals with finding and description of the rationale for research design and methodology that the study employs. These include:

i. Research methodology

ii. Research design.

iii. Population and Sample selection

iv. Data collection instruments, their reliability, validity and data collection.

v. Data processing and analysis.

The issue of methodology is complex, with confusion often arising between the terms methods and methodology (Kothari, 2004). Crotty (1998) suggests two issues that researchers should resolve in the process of designing a study. These are; what methods and methodologies should be used and the justification of the chosen methods and methodologies? For the purposes of this study, Crotty (1998) definition of methods and methodology was adopted. Methods were taken as the techniques or procedures used to gather and analyse data related to some research question for example, questionnaire, observation and document analysis. Methodology is the strategy, plan of action, process, or design behind the choice and use of particular methods and linking the choice and use of particular methods to the desired outcomes for example, case study research.

3.2 Knowledge claim

Knowledge claim is knowing how you can know what you know. This is at times referred to as epistemology. The knowledge claimed by the researcher affects the way the researcher seeks for the truth since the way we know has weighty implications on the way we perceive reality. Setting a knowledge claim means that researchers start a study with certain assumptions about how they will learn and what they will learn during their inquiry (Creswel, 2003). This study was conducted from a pragmatic perspective. Pragmatism derives from the work of Peirce, James, Mead and Dewey Cherryholmes, (1992), Murphy and Rorty (1990) and Patton (1990) who hold that present is always a new starting point. Pragmatism not only appreciates that there is reality that exist independently of the human mind but also appreciate the meaning of that reality is socially constructed. In this paradigm, instead of methods being important, the problem is most important and researchers uses all approaches to understand the problem (Rossman & Wilson, 1985). Pragmatism is not committed to any one system of philosophy and reality. This gives this study the advantage of honouring subjectivism as opposed to objectivity which form greater barrier to quality in mixed method research. Savage (1988) defined quality in mixed method research as "the ability of research to link itself with community social action and social consequences" (p.7). This definition is in-line with the study as it is a community project that aims to emphasize rigor and polyvocality. This is because a fact in mixed method research is another voice (Thody, 2006).

3.3 Research methodology

Mixed method research is used in the design of the study. This method is used as it brings with it the following advantages to the study as identified by (Schofield and Anderson, 1984; Rallis and Rossman , 1998; Eisner, 1991; Mertens, 2003):

i. Mixed method research is conducted in natural settings rather than laboratory manipulation. The researcher conducted the study on site (school) of the participant. This gave the study an advantage, as the school was the natural setting of the respondents. This enabled the researcher to report the reality on the ground. Also, it was imperative that the study does not disturb the normal running of the research sites. This was made possible by using mixed method where the method that caused the least disturbance was given preference by the researcher. In the case of this study document analysis, observation and questionnaire were used.

ii. Mixed method utilizes the researcher as the chief "instrument" in both data-gathering and analysis. This gave the study a great advantage because as the researcher observed reflexivity he also filtered the data through a personal interpretive lens that was situated in a specific educational, social, economic, political and historical moment as envisage in pragmatism paradigm.

iii. Mixed method has the advantage of emphasizing "thick description." This was realized by the researcher by obtaining "real," "rich," "deep," data which illuminated everyday patterns of action and meaning from the perspective of the participant and his environment. Curriculum evaluation being a political process this helped to reduce illusions and rhetoric's as the recommendations were contextual and generated from the findings.

iv. Mixed method research uses an inductive approach to data analysis. This gave this study an advantage because the researcher extracted the themes from the mass of the generated data which constituted the database. This phenomenon added to the positives as the conclusions were poly-vocal and heavily

grounded on the generated data. This increased the trustworthiness of the research and the probability of the actors implementing the recommendations.

3.4 Research Design

Research design is important because it's a conceptual frame-work within which research is conducted. Research design further informs the arrangement of the conditions for the collection and analysis of the data in a manner that aims to combine relevance to the research purpose (Kothari, 2004). Summarily, it is the adhesive that is used to join the whole study to come up with a coherent study (Wanyeki, 2012).

The study utilized exploratory case study research design. This is because in exploratory case studies, the researcher explores in depth a program, event, activity, a process, or one or more individuals (Creswel, 2003). The case(s) are either bounded by individuality (Automotive Technology curriculum in UoE), time or activity and researchers collect detailed information using a variety of data collection procedures (Stake, 1994).

This design fits the present study because it is the preferred strategy when "how" or "why" questions are being posed (objectives), when the investigator has little control over events (training), when thick description of reality is required and when the focus is on a contemporary phenomenon (curriculum) within some real life context (Yin, 2003). Also the study proposed some changes on the current practices and thus case study was preferred because case studies are 'a step to action'. Further, case study method recognizes the complexity and 'embeddedness' of curriculum reality and social truths and case study data is strong in reality (Aldelman et al, 1980 cited in Cohen, Manion and Morrison, 2005). These is the kind of strong reality and evidence

the Kenyan government and universities management appears to need in order to support and redirect energies and resources towards improving the quality of Technical Teacher Training and thus the choice of exploratory case study for this research.

3.5 Study site

The study was conducted in University of Edoret, Rift Valley and Western Kenya Association Technical Training Institutions (KATTI) regions. This selection was done purposively because the study area had to be a participant rich area. UoE made to the study sample because it was the only university in Kenya that had offered Technology Education for the last 27 years. Thus, UoE had alumni working in different fields unlike Moi University where the Programs were hardly two years old and have no graduates who could form part of the respondent of the study. Also, Rift Valley and Western KATTI regions were preferred because it was the home to many Technical Training Colleges where technology education department graduates were practicing.

3.6 Target population

Jeanings (2001) defines population as all the study subjects or study units that are focus of the research project. In this study the population consisted of University of Eldoret Technology education Program and University of Eldoret Technology education graduates working in Technical Training Institutes in Kenya. Mature entry and school based alumni were not included in the population because their earlier training could have influenced their learning process. Moi University Automotive Technology Program was not included as its first cohort of graduates had not been in the field longer than a year. Thus, Moi University had no graduates who could form

part of the respondent of the study. Also, its Automotive Technology Programs was still under formative evaluation and the study was a summative evaluation therefore locking them out of the sample.

3.7 Sampling procedure

Merriam (1998) stated that non-probability sampling was the method of choice in case studies. For the study, purposive sampling was used. This was done because the study targeted information rich participants. All the Automotive Technology subjects and curriculum materials were used in the sample. The Automotive Technology Education graduates were categorized according to the institutions where they worked. Mostly, information rich subjects were sampled by typical case sampling and snowballing from their respective practicing sites.

3.8 Sample size

In a case study, a sample of five or six may suffice a researcher prepared to obtain additional corroborative data by way of validation (Cohen, Manion & Morrison, 2005). The total sample size for the population was 42 lecturers. The lecturers were sampled from 21 technical training institutes that exist in Rift valley and western KATTI region. Only two lecturers were sampled from each of the 21 technical training institutions because the population of UoE Automotive Technology lecturers in technical training institution was very low (Nyerere, 2009). The technical institutes that were selected were only those that were in existence on or before the year 2009. This was because the recently established technical training institutes had either not established automotive engineering department or had not recruited any Automotive Technology lecturer.

3.9 Data collection tools

In researching about human beings, no single source of information could be trusted to provide a comprehensive perspective in any study program. As a result it was imperative to use several methods of data collection to improve on the reliability and validity of the data collected (Smith, 1975; Kitainge, 2005). Evidence for case study may come from six sources; documents, archival records, interviews, direct observation, participant observation, and physical artefacts (Yin, 2003). For this study three methods were used:

i. Document analysis

ii. Questionnaire

iii. Observation.

Schofield & Anderson (1984) and Yin (2003) reports that using a combination of data sources and collection methods are a validating aspect which cross-checks the data. This study used a combined data collection methods and sources such as questionnaire, document analysis and observation thus increasing the validity and reliability of the information since the strength of one approach compensates for the weakness of another approach (Cohen, Manion & Morrison, 2005; Yin, 2003).

Denzin (1970) and Johnson, Onwuegbuzie and Turner (2007) described the combined data collection methods as methodological triangulation. The study used methodological triangulation because it is a powerful way of demonstrating concurrent validity, particularly in mixed method research (Campbell & Fiske, 1959; Yin, 2003).

Thus, the justification for using triangulation in the study was based on the premise that it was an ideal method as a check for concurrent validity, the between methods approach embraces the notion of convergence between independent measures of the same objective (Campbell & Fiske, 1959). Further, through methodological triangulation, the researcher interference was controlled (Smith, 1975).

3.9.1 Questionnaire

The study employed sets of questionnaire in collecting data. This was because it provided an efficient way of collecting responses from a relatively large sample prior to data analysis (Lewis, Thornhill and Saunders, 2007). This tool was used in this explorative research because it enabled the researcher to identify and describe the variability in different phenomena (Lewis, Thornhill and Saunders, 2007). In addition, questionnaires if worded correctly normally require less skill and sensitivity to administer than in-depth interviews (Jankowicz, 2000), thus making it possible to use a research assistant in collecting data. The questionnaire was designed as a self-administered questionnaire as the researcher avoided contaminating the respondents' answers. Also, the respondents were competent and it was an efficient way of collecting data from a large sample. The questionnaire consisted of six printed pages. This was because research had found that four to eight A4 pages to be acceptable for self-administered questionnaire (Lewis, Thornhill and Saunders, 2007). Items using likert-style rating scale were used. The aim was to make the questionnaire attractive and easy for the respondent to understand. Further, the questionnaire was made short so as the respondent to consume less time responding and to improve the ease of coding when entering the data into the programs for analysis (Mugenda & Mugenda, 1999; Kothari,

2005). The ease of analysis of the data was the guiding principle at the design stage of the questionnaire.

3.9.2 Observation

Observational data was appropriate for this study since it accoded the researcher the opportunity to gather 'live' data from 'live situations' and in natural participant site settings (Morrison, 1993; Cohen, Manion & Morrison, 2005). The researcher also had the opportunity to participate and observe what was taking place *in situ* (in position). This is the advantage of observation as stipulated by Patton (1990). Participant observation was the preferred choice in this study because it enabled the researcher to understand the context of curriculum, to be open ended and inductive. Further, participant observation enabled the researcher to view things that might otherwise be unconsciously missed and to discover things that participants might have not freely responded to in questionnaires. Consequently, it enabled the researcher to move beyond perception-based data and to access personal knowledge. This is what Cohen, Manion & Morrison, (2005) stated as one of the greatest advantage of participant observational method. The study adopted a semi-structured observation format because it had an agenda of issues but it further gathered data to illuminate those issues in a far less pre-determined or systematic manner (Cohen, Manion & Morrison, 2005). This format was very suitable for the exploratory case study because it was solution generating, rather than solution-testing, which was the objective of the study. Also, the participant observer assumed a variety of roles within the case study situation and actually participated in workshop practice being studied. Yin (1982) observed that participation ranged from social interaction to doing the real activity.

This gave the researcher a unique opportunity to ask clarification questions that enabled a multi-dimensional data to be generated.

3.9.3 Document analysis

Documentary information is likely to be the most relevant data generating tool to every case study (Yin, 2003). This is because the researcher is less likely to be misled by documentary evidence and more likely to be critically correct in interpreting the contents of such evidence (Yin, 2003). For this case study, the most important use of document analysis was to corroborate augment evidence from other sources and identify points of curriculum weakness through constant comparison. When the documentary evidences were found to be contradictory rather than corroboratory, the study pursued the issue through further inquiry. Also, document analysis had an added advantage because it could be retrieved repeatedly for references and clarification.

3.10 Validity and Reliability of Research Instruments

In order to reduce the risk of obtaining incorrect answers to research questions emphasis on validity and reliability of research instruments were considered (Sunders et al, 2007). For convenience and clarity these two issues were handled separately.

3.10.1 Validity of data collecting instruments

A high reliability for the data collection instruments is necessary but not sufficient criterion for the adequacy of an instrument, it must be valid too. For data collection instrument to have been considered valid in the study the content selected and included in the instruments must have been relevant to the need or gap that had been established (Koul, 1992). Validity is mostly referred also to as construct validity.

Haynes et al (1999) and Trochim (2002) cited in Richard, Netemeyer and Bearden (2003, p. 2), ague that "construct validity represent the overarching quality of a research study… with other category or types of validity being subsumed under construct validity."

While ensuring construct validity in the study it is important to note that construct validity for the measure was not assessed directly but was "inferred from evidence that the measured substantive scores performed as expected…from the quality of the procedures that were employed in the development and validation of data" (Richard, Netemeyer & Bearden, 2003, p. 2). Therefore, the design of the data collecting instrument for the study was such that a lot of emphasis was placed on the use of simple clear language, appropriate response formats, objective observation, avoiding personal questioning, methodological triangulation and posing tautological questions to increase the research instrument validity.

Perhaps the most practical way of achieving greater validity in the study was to minimize the amount of bias as much as possible (Cohen, Manion & Morrison, 2005). Also validity was ensured by preventing research participants from responding in a socially desirable manner. This was actualized by preventing Socially Desirable Responding (SDR) that stems from both Impression Management and Self-deceptive Bias. The techniques that the study employed to prevent SDR included; upholding strictly to research ethics by assuring research respondents anonymity and confidentiality and using a researcher assistant anonymous to the participant.

Also experts in the school of education helped establish content validity Mitchell (1996); Richard, Netemeyer and Bearden (2003) as they enabled the researcher to make necessary amendments prior to pilot testing. It was in light of this that the

researcher asked four experts to comment on the representativeness and suitability of the data generating instruments. The experts were provided with a scale to rate the validity of different sections of the questionnaire and observation guide. All the four experts found the data generating instruments to be valid. The experts also provided suggestions and modifications that were made on the structure of the research questions hence improving the instruments validity.

The researcher ensured validity of the data generating instruments through the following order. After the instruments were designed, firstly, the opinions of colleague post-graduate students within the University were sought regarding the format and the content of the instruments. This led to the first revision of the instruments which entailed language correction, removal of some sections and addition of others to improve the data collecting instruments validity. Secondly, the opinions of two academic supervisors and two other senior experts and members of the Faculty were sought. Their opinions led to the second revision of the instruments and this involved presenting the cover letter in a letter format, reducing the amount of wording in the research instruments, making each item to ask a specific item and introduction of subheading in each section so as to guide the thinking of the respondent.

3.10.2 Reliability of data collecting instruments

In research, reliability can be regarded as a fit between what researchers' record as data and what actually occurs in the natural setting that is being researched (Bogdan & Biklen, 1992). Reliability of the data affects implementation of the research findings. That is, the degree of accuracy and comprehensiveness of coverage be very high and holistic respectively. Brock-Utne (1996) argued that research being holistic

it should strive to record the multiple interpretations of intention and meanings given to situations and events. Thus, in the study reliability was construed as dependability and conformability of data collected to the reality (Guba & Lincoln, 1984).

For the study, dependability was ensured through piloting and establishing the coefficient of reliability, member checks (respondent validation), triangulation, prolonged engagement in the field, persistent observations in the field, reflexive journals, and independent audits (identifying acceptable processes of conducting the inquiry so that the results are consistent with the data) (Cohen, Manion & Morrison, 2005). Audit trails and critical subjectivity enabled the study to address the issue of conformability of results. These helped the study to avoid responding only to the 'loudest bangs or the brightest lights' (Cohen, Manion & Morrison, 2005).

Prior to using the research questionnaire to collect data it was pilot tested. The purpose of the pilot test was to refine the questionnaire so that respondents could have no problems in answering the questions and there could be no problems in recording data. In addition, it enabled the researcher to obtain some assessment of the questions validity, the likely reliability of the data that was to be collected and gave the researcher an idea of the questionnaire success rate (Bell, 1999; Saunders, 2011). Preliminary analysis using the pilot test data was undertaken to ensure that the data collected enabled the research investigative questions to be answered.

The number of people on whom to pilot the questionnaire and the number of pilot tests to be conducted is dependent on the research item(s), research objectives, the size of the research project, the time and money resources the researcher have available and how well the researcher has initially designed the questionnaire (Fink, 1995). For small research of less than hundred respondents, the minimum number for

a pilot test should be ten respondents (Fink, 1995). Therefore this study used 10 respondents from university of Eldoret fourth year class since they had the experience of teaching practice and industrial attachment to conduct the pilot study. Cronbach's coefficient Alpha was used to ascertain internal consistency within related group of data collecting tool. Developed by Cronbach (1951), the coefficient alpha method was used in this study because the items were not scored dichotomously.

Table 3. 1: Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.939	0.94	118

The Cronbach's Alpha was found to be 0.939 and this indicated that the tool was highly reliable due to its high internal consistency that is how closely asset of items are in a group.

3.11 Procedure of data collection

Formal authority to conduct research was sought from the Ministry of Education science and technology. Data generation was achieved through the administration of the data generating instruments. The order of data generation was document analysis followed by observation and then administration of questionnaire. The sequential order was important because document analysis data informed the researcher on what to expect to observe and generate in the questionnaire.

3.12 Data analysis

In case study data analysis, much depends on researcher's own style of rigorous linking, researcher's experience, along with sufficient presentation of evidence and careful alternative interpretations (Yin, 2003). To circumvent this disadvantage, the research objectives clearly helped to focus attention on certain data and to ignore others (Yin, 2003). The research objectives also enhanced a cross-case analysis Miles & Huberman (1994) where the researcher compared and contrasted different respondents through constant comparison (Glaser and Strauss, 1967). Constant comparison and contrasting further helped the researcher to come up with alternative explanations of the same phenomenon.

Once the data generation exercise was over, responses were categorized depending on their type to facilitate coding and processing. A master codebook for quantitative data was designed with the help of SPSS version 20 to ensure that all the generated data was coded uniformly. After cording was done qualitative data was keyed in the data view book of SPSS program. The keyed data was then cleaned to remove typing errors. Analysis of the data was then done by running descriptive and frequency analysis. The generated data and tables were then copied to the word program and edited to APA sixth edition format.

Parton (2005) notes that the analysis of qualitative data depends on the nature of the data and the conceptual framework employed in the analysis. Taking into account the above, the study utilized content analysis approach in analyzing qualitative data and it involved quantizing where numbers will articulate the message clearer than words. Firstly, a master code book was established using the Microsoft word. The generated qualitative data was then keyed in to the code book. Themes were then generated

from analysis of the generated content. Data interpretation was then done according to the emerging themes.

3.13 Field Experiences

The researcher faced various constraints in the process of data collection including absence of respondent in some institutions, reluctance to respond to the questionnaire by the respondents, and delays in completing the research instruments. Also financial constrains was experienced by the researcher due to under budgeting for the research process. Thus, the researcher recommends that during proposal presentation, budgeting be treated with utmost seriousness and the candidates be asked to explain vividly how they are going to raise the money for the research. Failure to probe budgeting deeper may lead to "Under the Tree Data (UTD)" due to lack of finances to conduct a genuine data generation exercise.

Also the researcher encountered some respondents who requested payment before they could respond to the questionnaire. This is because there is a lot of misunderstanding by TVET trainers in middle level colleges about the function of research. The researcher observed that trainers undertaking postgraduate studies or with postgraduate degrees were more willing to respond to the questionnaire than their counterpart colleagues with bachelor's degree only. This could be because the former had been exposed to research methods and its importance while the latter had not. The research therefore proposes that research methods as a course be introduced in undergraduate level and be a requirement that they must write a research project for examination purposes. This will introduce the TVET graduate to research and make them appreciate the same.

3.14 Summary of the chapter

This chapter highlighted the methods and methodology used for this study. It further stated the rationale for the choice of the methods and methodology used. The study used explorative case study design. Questionnaire, observation guide and document analysis guides were used to generate data. Reliability and validity of the data generating instruments were established first through a pilot study and expert check respectively. The generated data was coded and analyzed according to the nature of the generated data.

CHAPTER FOUR

DATA PRESENTATION, INTERPRETATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This study investigated the relevance of UoE Automotive Technology Technical teacher training curriculum to the job market. The respondents were drawn from 21 Technical Training Institutions (TTI) with a total of 42 respondents. The focus of the study mainly looked at answering the following research questions:

1) How relevant is the purpose of Automotive Technology to job market requirement?
2) What is the relevance of subjects offered in Automotive Technology to job market requirements?
3) Are the university Automotive Technology curriculum materials relevant to the job market?
4) How do the teaching methods affect the relevance of Automotive Technology program to job market requirement?
5) Is the Automotive Technology curriculum evaluation mechanism effective to ensuring relevance of the curriculum to the job market?
6) What are the challenges facing effective preparation of relevant Automotive Technology graduates for the world of work?

This chapter outlines the results of the study from the different data generating tools used. The chapter includes data generated by questionnaire, observation and document analysis.

4.2 Presentation

The quantitative data generated from questionnaire is of likert scale and open ended question. The data is presented in tables and graphs where appropriate. The qualitative data is coded and quantized for easy understanding.

The qualitative items were embedded in the questionnaire for the sake of getting any omitted information or getting an explanation of the feelings of the respondent. For this qualitative data the voice of the respondents is the unit of analysis. This is because in education individuality of instruction is held important thus every view counts with equal weight. The generated data was coded, analyzed and the emerging themes generated.

Data from document analysis was also presented. The documents that the research used to generate data were diploma and craft automotive engineering curricula published by Kenya Institute of Education (KIE, 2012) and the University of Eldoret Automotive Technology curriculum. The document analysis data focused mainly on the following objectives:

1) To explore the relevance of the course purpose of power mechanics technology to job market requirement.

2) To review the relevance of subjects offered in power mechanics technology to job market requirements.

The observation guide was also used to generate data for this study. Observation took place between 20th February 2015 and 4th march 2015. The observation sough to find out the appropriateness of curriculum materials in the School of Education in

preparing graduates in automotive technology who are relevant to the job market. The data generated from all the tools is discussed concomitantly.

The study discusses the findings from questionnaire, observation and documents concomitantly as they are to collaborate each other to increase the validity and reliability of the findings. The findings are discussed in the context of existing literature. Later on, conclusion and recommendations are made based on the research question and the data generated.

4.3 Demographic data

Section one of the questionnaire consisted of two items. The items were demographic in nature. These items included respondents' year of graduation and gender. From table 4.1 the distribution of the respondents based on the year of graduation was fairly uniform with (33.4%) of the respondents graduating between 2007 and 2008. This is important for this study as the year of graduation will not influence the out-come of the results since it is homogeneous.

It is also worth noting that from 2010 to 2015 there were very few respondents (4.8%) and this can be attributed to the fact that it takes on average five years for an Automotive Technology graduate to be employed by Teachers Service Commission (TSC). This long stay before a teacher is employed may have been caused by withdrawal of the Technical subjects from secondary school curriculum and the refusal of TSC to employ Automotive Technology graduates as mathematics/physics teachers in secondary schools. Ideally, Technical subjects should have been retained in secondary schools. This is because the technical subject gives the learner a perfect foundation of pursuing Technical and Vocational careers in higher institutions of

learning and equipping the youth with employable skills after secondary school. In fact if the country is committed towards vocationalization of education in secondary schools, the Technical subjects should be made compulsory. That is, the student should be required to take one technical subject as a compulsory subject.

Table 4. 1: Automotive Technology alumni Year of graduation

Year of Graduation	Frequency	Percent
1995	2	4.8
1997	1	2.4
1998	1	2.4
1999	3	7.1
2000	1	2.4
2001	1	2.4
2003	2	4.8
2004	4	9.5
2005	3	7.1
2006	3	7.1
2007	7	16.7
2008	7	16.7
2009	5	11.9
2012	2	4.8
Total	42	100.0

Source: Field data.

The sex distribution is skewed with majority of respondents being male. This observation can be attributed to the fact that the field is dominated by male even at the university enrolment level. This is clearly shown in Figure 4.1.

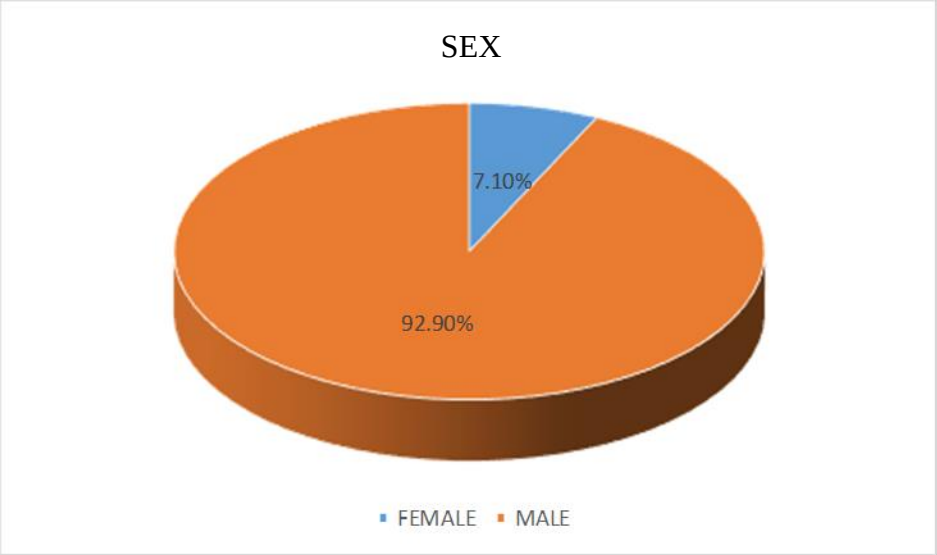

Figure 2: Pie Chart Showing Distribution of Respondents By Sex

4.4 The relevance of the purpose of Automotive Technology to job market requirement.

The first research question was addressed by four items in the questionnaire and document analysis data. For clear representation of the data, the items are presented differently.

4.4.1 Purpose of Automotive Technology as compared to job market requirement

The purpose of the course is very paramount in the delivery of a curriculum. In this study the purpose of the curriculum includes aims of the curriculum, philosophy, objectives, mission and the role of the Technology Education Department. For any curriculum to remain relevant, the purpose of the curriculum should be relevant to the job market requirements. This section evaluates and presents the University of Eldoret and the curriculum for Technical Institution simultaneously for comparison purposes.

Objectives of the University of Eldoret Automotive Technology Education curriculum

The training in automotive technology in the University of Eldoret is guided by the following objectives:

a) To prepare graduate teachers who will be able to teach the 8-4-4 secondary level technical group of subjects, namely: metal work, woodwork, building construction, drawing and design, electricity and power mechanics
b) To prepare teachers in technical education for training institutions where such level of competence may be needed
c) To improve the quality of teaching of the technical subjects in the education system.

National goals for education as stipulated in Technical Institute Curriculum

The education systems in Kenya should be guided with the national goals of education. Thus, all educational institution should work towards achieving the national goals of education. The following are the national goals for education (KIE, 2012)

1. Foster nationalism, patriotism and promote national unity
2. Promote the social economic, technological and industrial needs for national development
3. Develop individual development and self-fulfillment
4. Promote sound moral and religious values
5. Promote social equality and responsibility
6. Promote respect for and development of Kenya's rich and varied culture
7. Promote international consciousness and foster positive attitudes towards other nations.
8. Promote positive attitude towards good health and environmental protection

National aims of Technical Training programs

All institutions that are classified as TVET institution should develop their curriculum to be in tandem with the national aims of Technical training programmes. This means that the University of Eldoret Automotive Technology curriculum should aim at achieving the national aims of technical training program. The following are the national aims of Technical Training program (KIE, 2012)

a) Provide training opportunities for the increasing number of school leavers to enable them to be self-supporting.
b) Develop practical skills and attitudes which will lead to income generating activities in the urban and rural areas through self-employment
c) Provide practical education and training skills which are responsive and relevant to Kenya's agricultural, industrial, commercial and economic needs
d) Provide the technical knowledge and vocational skills necessary to enhance the pace of national development
e) Encourage self-employment while at the same time producing skilled artisans, technicians and technologists for both formal and informal sectors at the ratio of one technologist to five technicians to 30 craftsmen/artisan

Objectives of the Technician Training Programmes

Technical Training Institutions (TTIs) were established in 1986 to train technicians. The UoE Automotive Technology education graduates are required to train technicians in TTIs. Thus they should be well trained so as to be able to implement the objectives of the technician training program which are:

1. Develop skills which will be responsive and relevant to the country's human resources required at the middle level
2. Prepare the trainees so that they can enter the world of work with confidence for either salaried employment or self-employment
3. Impact adequate skills which will enable the trainee to perform middle supervisory functions.

General objective of Diploma in automotive engineering course

Diploma in automotive engineering course is the course that the automotive technicians go through. The UoE Automotive Technology graduates should be able to ensure that by the end of the course, the automotive trainee in TTIs is able to:

a) Test and analyze vehicle performance
b) Interpret technical information on vehicle body work and performance
c) Manage a vehicle production line
d) Apply information communication technology in the vehicle industry
e) Design and implement environment, health and safety programmes
f) Apply information communication and technology in vehicle production line and research
g) Create a firm foundation for further training

The purpose of Automotive Technology curriculum is very important in making the course products relevant to job market. However from the generated data, the stated course purpose for the UoE Automotive Technology education curriculum was very broad. The purpose of the course is meant to cover all the courses offered in Technology Education Department. In-fact the course objectives stated in the

technology education curriculum was not specific for the Automotive Technology curriculum. It is worth noting that the purpose of the course of Electrical and Electronics Technology, Building and Construction Technology, Metal Technology, Computer Technology and Automotive Technology should not be the same as they purpose to serve different interests. Therefore lack of specific purpose of Automotive Technology curriculum is a great omission and a big contributing factor in making the curriculum not to meet the job market expectations. In addition, the curriculum was devoid of stated philosophy of the course, mission of the course and aims of the course. This scenario is propagated despite Shiundu and Omulando (1992) advice that since the curriculum is a means by which institutions strive to achieve the aims of education, it is necessary to spell out those aims as first step of planning a relevant curriculum.

Lack of specific stated objectives of Automotive Technology curriculum, puts the evaluators of the course in an awkward situation since they don't know what to evaluate the course against and the criteria to use when evaluating. In fact lack of clearly and specifically stated aims of automotive technology curriculum means that the University of Eldoret has no means of judging whether what they are doing is achieving the intended goals (Heywood, 2005). As Nichols, J and Nichols, K (1991) advises, "Instead of universities assuming' their accomplishments, institutions are being challenged to demonstrate their overall effectiveness through assessment of departmental program out-comes and objectives linked closely to the institution's statement of purpose" (p, 13). It is on this basis that the study finds that the Automotive Technology curriculum is not relevant to the job market.

A mission statement should be the emotional hook on which an institution hangs on (Heywood, 2005). It is disturbing that evidence from the generated data indicates that the UoE Automotive Technology curriculum lacks a mission statement. This means that the linkage between the mission of the curriculum and the reality of the institution is broken (Heywood, 2005). For a program to be relevant to the job market the mission statement has to be expanded considerably and a working relationship between the statement of purpose and the intended out-comes and objectives at departmental and program levels must be established. It is lack of this mission statement that research still reports negative attitudes among TVET graduates towards TVET education (Wanyeki, 2012). This is because the University of Eldoret graduates do not know the clear mission of Automotive Technology education.

Also, from the study, at the time of the study the Automotive Technology curriculum lacks the philosophy of the curriculum. This means that Automotive Technology curriculum lacks the value system that drives a particular curriculum, syllabus, course or teaching session (Heywood, 2005). Lack of the philosophy of the curriculum implies that every lecturer teaches using his/her own philosophy Sherren and Long (1972) which could be different from the intended philosophy of the curriculum. Sherren and Long (1972) further conclude that if a curriculum has no philosophy, it could not be expected to examine the career goals of its students. In order for the lecturer to know which “Automotive technology characteristics” he/she would like to teach, he/she must first examine the philosophy of Automotive Technology education to understand its goals, attitudes and a compatible educational theory which may be sensitive to the goals and attitudes of the students. Lack of the philosophy of the curriculum leaves lecturers to fumble, not being able to pinpoint the exact Automotive Technology characteristics to teach and the most appropriate educational theory to

employ while teaching. This occurrence may contribute enormously in propagating mediocrity in teaching of Automotive Technology.

Sinclair and Tilston (1979) asserts that Technology Education teachers need a philosophy of the curriculum to answer and address important technological questions and raging controversies in TVET. It is the lack of this philosophy of Automotive Technology that to date the following questions remains a paradox to be solved and a never ending debate in University of Eldoret.

1. How does Automotive Technology Education relate to teaching, training, engineering and science?
2. What is the relationship between Automotive Engineering and Automotive Technology (as interpreted by engineers, technologists and social scientists)?
3. What is the proper field of activity for an Automotive Technologist as compared to that of automotive engineer?
4. What degree of responsibility should Automotive Technology Educationist take in relation to the social impact of the works of technology?
5. Who should train Automotive Technology graduates?

Since Technology Education in UoE lack a philosophical base for answering such questions as these, it is virtually impossible for the educationist to formulate an adequate concept of what constitutes Technology Education. Without such a concept, the educator is severely handicapped in developing suitable curricula for Automotive Technology education. This is among the major reasons why UoE Technology Education Department is still struggling in coming up with a suitable Automotive Technology curriculum since the questions of what to train? Who should train? Who to train? How to train? And purpose for training? Remain answered. Also these

questions were the major pillars for Ogola, Ondieki and Akumu (2014) paper titled "Re-Orienting Engineering profession Bodies Towards Industrialization for Sustainable Development in Kenya" which tried to seek answers for the questions. Heywood (2005) recommended that a philosophy of the curriculum has an important role to play in determining the aims of the curriculum. It is, therefore, important that UoE Technology Education Educators to formulate or adopt a philosophy of technology education that describes the context and states the rationale for the development of the curriculum.

Also from the broad objectives stated in the Technology Education curriculum of UoE, the curriculum is to prepare professional Technical teachers for secondary and post-secondary institutions where such level of competence may be needed. This is a complete mismatch with the aim of Technical institution automotive curriculum objective which is to prepare trainees to work in automotive repair and assembly industry. If the Automotive Technology teacher himself/herself is not trained to work in the industry how can he/she train trainees to work in the industry? This lack of industrial perspective in the UoE Automotive Technology curriculum may be the contributing factor that makes graduates enter the field of work ill-prepared.

4.4.2 Ability of UoE Automotive Technology Curriculum to develop the intended Purpose

This study was able to gather from literature review the main purpose Automotive Technology curriculum should strive to serve. This is what was used to test if the automotive curriculum was achieving its intended purpose. This is because at the time of the study the purpose of the curriculum was conspicuously missing in University of Eldoret Automotive Technology curriculum. Thus, this study sought to find out if

Automotive Technology curriculum helped students to develop critical and creative thinking skills.

The purpose of the curriculum is to impart positive change in curriculum stated behaviors. From the behaviorist perspective, for learning to have taken place an individual ought to have positive change in behavior. Thus, one of the questionnaire items sought to find out the extent to which Automotive Technology curriculum helped respondents to develop the eleven behaviors shown in Table 4.2. From the table the responses indicate the extent to which Automotive Technology curriculum helped develop critical and creative thinking skills in the students.

An examination of the responses indicate agreement that actually the respondents were able to develop ability to gather evidence by asking in depth questions, using data to make informed judgments about a technical problem and identifying problems using technology. Conversely, the respondents were able to develop ability to solve problems using technology, evaluate technical problem solution alternatives using technology and take intellectual risks while solving new technical problems. Equally, the graduates acquired ability to integrate existing technical knowledge across disciplinary boundaries, evaluate the limits of own technical knowledge, contribute to the improvement of society by using technology and cope up with the changing technology by self-learning. This implies that the UoE Automotive Technology curriculum is able to attain the fundamental purpose for any Technical teacher curricula as stated by DeVore (1988) which is to teach the critical thinking skills for individual to become good Automotive Technology teacher. On the responses on ability to control technology by operating different automotive repair machines, it is established that the respondents feel that the Automotive Technology curriculum did

not facilitate them to acquire this ability. Since Automotive Technology is a practical oriented course, lack of practical skills among teachers propagates mediocrity in teaching Automotive Technology since the teachers are required to handle practical skills. This implies that the curriculum is only good in imparting theoretical knowledge and teaching skills as seen in table 4.2, but poor in imparting practical skills. Therefore, Automotive Technology graduates could be termed as good in theory Knowledge but poor in psychomotor skills as they cannot control technology. According to Daiber and LaClair (1986) anybody who cannot control technology is technologically illiterate. This is because at a basic level the preparation of Technology Education teachers should involve three primary dimensions. Namely, knowing, Doing, and Valuing (De Miranda et al, 2009). Therefore, because the respondents lacked capability "to do" they are irrelevant to the world of practical work. In addition, the Automotive Technology curriculum does not meet job demand KIE (2012) which is to train Automotive Technology teachers who should be able to: test and analyze vehicle performance, interpret technical information on vehicle body work and performance and manage a vehicle production line.

This irrelevancy in the UoE Automotive Technology curriculum as shown in table 4.2 calls for the curriculum to be reviewed so as to meet the job market demand. This will make the curriculum to produce market relevant graduates. Also this study in table 4.3 established the extent to which automotive technology curriculum helped respondents develop teaching literacy. In Table 4.3 the respondents' decisions rate how Automotive Technology curriculum helped develop teaching literacy in the respondents. The responses on some of the items were in agreement. The respondents were in agreement that Automotive Technology curriculum developed in them ability to identify information effectively from a variety of sources and formats.

Table 4. 2: Responses on the Extent to which Automotive Technology Curriculum Helped Respondent Develop Outlined Skills

Behavior	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Ability to gather evidence by asking in depth questions	2.4	26.2	2.4	57.1	11.9	3.50
Ability to use data to make Informed judgments about a technical problem	2.4	38.1	38.1	38.1	21.4	3.38
Ability to identify problems using technology	2.4	31	2.4	42.9	21.4	3.50
Ability to solve problems using technology	9.5	40.5	0	23.8	26.2	3.17
Ability to evaluate technical problem solution alternatives using technology	7.1	31	4.8	40.5	16.5	3.29
Ability to take intellectual risks while solving new technical problems	7.1	45.2	0	26.2	21.4	3.10
Ability to integrate existing technical knowledge across disciplinary boundaries	2.4	40.5	0	40.5	16.7	3.29
Ability to evaluate the limits of my own technical knowledge	2.4	26.2	2.4	45.2	23.8	3.62
Ability to contribute to the improvement of society by using technology	7.1	14.3	0	47.6	31	3.81
Ability to cope up with the changing technology by self-learning.	4.8	11.9	0	54.8	28.6	3.90
Ability to control technology by operating different automotive repair machines	14.3	57.1	0	26.2	2.4	2.45

Source: Field data. $X \geq 3.00$ Agree

Conversely, respondents developed ability to critically evaluate information effectively from a variety of sources and formats, use information effectively from a

variety of sources and communicate numerical data. Also, this study established that the respondents developed ability to select appropriate technology to enhance the communication of knowledge and communicate key information from complex texts effectively to respondents. Equally, respondents developed ability to use different teaching methods effectively, team work in a collaborative manner with team members to complete tasks and demonstrate ethical reasoning of mind in decision making including academic integrity. These demonstrate that the curriculum is achieving its objective of developing critical thinking skills (Heywood, 2005).

From the responses in table 4.3 it is clear that the Automotive Technology curriculum is responsive in helping graduates develop most of the required professional teaching literacy. This is the reason why this study finds that the respondents are good in teaching theoretical content. A view supported by Rono (2015) study. This is because the respondents are adequately trained on how to be effective teachers and have good mastery of content to teach especially in theoretical lessons.

Further analysis of the responses indicate that Automotive Technology curriculum did not develop in respondents ability to create visual media for teaching and communicate complex engineering design blue prints. Lack of these abilities may deny the respondents ability to teach technologies relevant to the world of work (Rono, 2015). Also the teachers will be unable to take advantage of the computer technology to develop relevant learning resources that may enhance the teaching process (Collins & Halversone, 2010). This makes the respondents to have inadequacies especially when it comes to designing and communicating complex engineering designs as they cannot design, interpret and communicate engineering blue prints.

Table 4. 3: Responses on the extent to which Automotive Technology curriculum helped respondents develop teaching literacy

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Ability to identify information effectively from a variety of sources and formats	0	19	2.4	50	28.6	3.88
Ability to critically evaluate Information effectively from a variety of sources and formats	4.8	28.6	2.4	47.6	16.7	3.43
Ability to use information effectively from a variety of sources and formats	0	28.6	4.8	47.6	23.3	3.71
Ability to communicate numerical data	0	23.8	0	42.9	38.1	4.00
Ability to select appropriate technology to enhance the communication of knowledge	4.8	19	0	54.8	21.4	3.69
Ability to use appropriate technology to enhance the communication of knowledge	0	23.8	0	57.1	19	3.71
Ability to create visual media for teaching.	14.3	42.9	0	28.6	14.3	2.86
Ability to communicate complex engineering design blue prints(TD)	14.3	47.6	0	33.3	4.8	2.67
Ability to communicate key information from complex texts and effectively to students	2.4	23.6	2.4	40.5	31	3.74
Ability to use different teaching methods effectively	0	11.9	0	38.1	50	4.26
Ability to team work in a collaborative manner with team members to complete tasks	0	11.9	0	38.1	50	4.26
Ability to demonstrate ethical reasoning of mind in decision making including academic integrity	2.4	9.5	0	35.7	52.4	4.26

Source: Field data. $X \geq 3.00$ Agree

Also the respondents have inability to create visual teaching aids for teaching purposes which could help during teaching especially where the realer is not available

or real practice is very expensive (Dos Reis & Santo, 2016). This in-turn led to ill-preparation of the students in psychomotor skills as the lack of materials and inability of the teacher to create models means no practices will be carried out (Collins & Halversone, 2010).

4.4.3 Extent to which Automotive Technology curriculum helped respondents develop learning outcomes

Table 4. 4: Responses on the extent to which Automotive Technology curriculum helped student develop learning outcome

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Diagnosing an automotive engine	19	59.5	0	19	2.4	2.26
Preparing parts list for design purpose	16.7	52.4	0	28.6	2.4	2.48
Welding using arc welding	35.7	52.4	0	11.9	0	1.88
Welding using gas welding	49.9	42.9	0	14.3	0	1.86
Repairing an automotive engine	16.7	64.3	0	19	0	2.21
Developing good command of automotive theoretical knowledge	7.1	19	0	33.3	40.5	3.81
Developing engineering drawings skills using computer software's	69	26.2	0	4.8	0	1.4
Selecting engineering materials for engineering design	7.1	54.8	0	31	7.1	2.76
Carrying out spray painting and auto body repairs	69	31	0	0	0	1.31
Becoming an effective teacher	0	11.9	0	50	38.1	4.14

Source: Field data. $X \geq 3.00$ Agree

Table 4.4 demonstrates the respondents' rating on how Automotive Technology curriculum helped develop the desired learning outcome. The respondent's rating in

only two of the items are in agreement. The respondents were in agreement that Automotive Technology curriculum developed in them mastery of automotive theoretical knowledge and made them effective teachers of automotive technology theory. This finding is in agreement with Rono (2015) study finding. This confirms that the curriculum is rich in theoretical content and the prerequisite professional teacher courses as seen in table 4.4 and Rono (2015) study.

From table 4.4 respondents indicate that Automotive Technology curriculum is not able to impart psychomotor skills in its students. These skills include diagnosing an automotive engine for problems, preparing parts list for design purpose, arc welding and gas welding. Equally, the respondents did not acquire skills for repairing an automotive engine, developing engineering drawings skills using computer software's, selecting engineering materials for engineering design and carrying out spray painting and auto body repairs. A critical analysis of these shortcomings indicates that they are all elements of psychomotor skills. A technical teacher is trained to go and teach, among others, artisan courses which call for 90% practical application. The lack of these psychomotor skills makes the respondents incompetent to handle technical education (Atsumbe, Raymond, Idris, & Mele, 2012). A teacher who is not skilled in production process is not able to instruct practical courses (MoE, 2000). This is why in Denmark one ought to have at least five years relevant labour market experience before he is enrolled as a TVET teacher (Kingombe, 2012).

Automotive technologies, being a hands-on course, respondents are required to be able to control technology by operating different machines (Daiber & LaClair, 1986). From the generated data in Table 4.4 the Automotive Technology curriculum failed to impart this ability in the respondents. The curriculum is only able to develop

theoretical literacy in the students and not practical competencies. This might be attributed to the fact that UoE Automotive Technology curriculum lacks a philosophy of the curriculum and specific aim or objective of the curriculum addressing the practical competencies required. This is a clear contradiction to the objectives of Diploma in automotive engineering which are to enable trainees to be able to, test and analyze vehicle performance, interpret technical information on vehicle body work and performance and manage a vehicle production line (KIE, 2012). This may be among the reasons why there are complaints from the job market about the ability of the University of Eldoret graduates to teach practical skills in the job market. In fact this may have contributed to the motion proposed by Technical Principals in a KATTI conference held in Mombasa to allow Diploma graduates to be re-considered for teaching jobs in Technical institutions as they are considered to be stronger in practical knowledge than degree holders. The element that makes Diploma graduates to be stronger in practical skills than the degree holder is the model of teacher education that is used to train TVET teachers. For diploma TVET Teachers a model mainly based on the recruitment of practitioners of a certain field of occupational work, who complete additional courses in teaching and training management techniques usually leading to a teaching certificate, which provides the necessary qualification for the work in the education sector. For the degree teachers an integrated model is used where course content and pedagogy is taught concomitantly.

Also the curriculum materials and equipment's are either inadequate or missing from the UoE workshop. This inadequacy contributes greatly to poor practical acquisition by the Automotive Technology curriculum graduates (Rono, 2015). The respondent also indicated that there is no a stand-alone practical examination for evaluating the practical competence of the learners. This could have contributed greatly to poor

practical skill acquisition by the respondents since they knew they were not to be assessed based on their practical capabilities and therefore, did not bother acquiring practical skills at all.

For anybody to be technological literate he/she must be able to control technology (Daiber & LaClair, 1986). Because this has not been achieved by Automotive Technology curriculum, then the study concludes that the Automotive Technology graduates are technologically disadvantaged in terms of practical competencies, and are not relevant for the field of practical Automotive Technology work in the modern world.

4.4.4 Relevance of UoE Automotive Technology to TTIs goals

Table 4.5 presents response to the questionnaire items concerning relevance of UoE Automotive Technology curriculum to TTIs goals. The respondent's decisions are in agreement that Automotive Technology curriculum assisted them to learn teach theoretical lessons in Technical Training Institutions and also gave them a base for academic development. This data is in concurrence with data in Table 4.3 that shows that the curriculum is rich in theoretical content.

Also, the ability of the curriculum to inculcate lifelong learning in the student could be the reason why some of the technical teachers after spending some years teaching, they manage to self-train and acquire the practical skills while in the field (Sawchuk, 2010). This is a great advantage to the UoE Automotive Technology curriculum as technology is changing at a very high rate and the teachers have to cope which the speed at which Automotive Technology is changing.

Further analysis of the responses in table 4.5 indicates that the respondents are of the opinion that Automotive Technology curriculum did not assist them to develop mastery of teaching practical lessons. These by extension affected their ability to be self-employed by running an automotive garage because they lack practical skills. This may be the reason why Wanyeki (2012) in a study titled adoption of new technology by Jua Kali automobile mechanics in Eldoret municipality observed that very few graduates are found practicing in the automotive repair industry. This is because the graduates have negative attitude towards blue color jobs and lack employable skills (Wanyeki, 2012)

Table 4. 5: Responses on the question: What I learned in Automotive Technology curriculum was relevant to my?

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Teaching theoretical lessons	2.4	16.7	2.4	31	47.6	4.05
Teaching practical lessons	9.5	64.3	0	21.4	4.8	2.48
Self-employment (running an automotive garage)	14.3	66.7	0	19	0	2.24
Academic Development (Lifelong learning- become continually educated)	2.4	7.1	0	35.7	54.8	4.33
Community Development	4.8	23.8	2.4	45.2	23.8	3.6

Source: Field data. $X \geq 3.00$ Agree

In addition, in table 4.4 the lowest scoring item with a mean of 1.4 is that the respondents were not able to draw basic engineering drawings using relevant computers software's. The situation is not made any better as respondents cited that Automotive Technology curriculum is only relevant to a very little extent in preparing

them to teach practical lessons and, by extension, using the same practical knowledge for self-employment (table 4.5). This makes the UoE Automotive Technology curriculum inadequate to the job market requirements. This is because one of the National Aims of Technical Education is to make graduates self-reliant, self-employed and to use information communication and technology in automotive production line (KIE, 2012). Astride that UoE Automotive Technology curriculum has failed to achieve thanks to its lack of practical domain (Rono, 2015). These consternations are responsible for ill-prepared teachers, and if they are not controlled by the university, the menace of mediocre teachers will be difficult to eliminate.

However, it is worth noting that the Automotive Technology curriculum is responsive in meeting one of the national goals of education which is to create graduates who could assist in community development (KIE, 2012). This is important as the respondents are expected to teach in Technical institutions while working very closely with the community as they fulfill their social-corporate responsibilities.

4.5 To review the relevance of subjects offered in Automotive Technology to job market requirements.

The second research question was addressed by three items in the questionnaire and document analysis data. For clear representation of the data, the items are presented differently.

4.5.1 To what extent are the subjects offered in Automotive Technology relevant to job market requirements?

Table 4.6 presents the students responses on how Automotive Technology curriculum prepared them to teach theory lessons. The respondents decisions are in agreement that Automotive Technology curriculum assisted them learn to teach theoretical

lessons in engine technology, vehicle technology, technical drawing and design. Also the respondent agree that they are competent to teach technical drawing, thermodynamics, Strength of materials, fluid mechanics, kinetics and kinematics, engineering mathematics, engineering materials and workshop organization and management. Maintaining a strong, quality-driven Technology Education program begins with the preparation of competent and caring instructors (Kozak & Robb, 1991; Wright, 2002). Prior to developing an instructional strategy, the cognitive, affective, and psychomotor skills that are to be taught must be defined and their interrelationships specified (Daiber & LaClair, 1986). These should be done in line with Piaget (1964) theory that cognitive development is a progressive reorganization of mental processes resulting from biological maturation and environmental experiences. Piaget (1964) believed that trainees construct an understanding of the world around them, experience discrepancies between what they already know and what they discover in the environment, and then adjust their ideas accordingly. This is because he believed that cognitive development is at the center of human organism. The cognitive skills in the Automotive Technology curriculum are clearly defined and this could be the reason why the respondents indicated that the subjects taught to them were relevant in developing their abilities to teach theory lessons.

The data presented in table 4.6 confirms that indeed the respondents feel competent in handling most of the theoretical content. However, from analysis of the same data Automotive Technology graduates indicated that they completely lack ability to handle theory in vehicle bodyworks technology. This agrees with Rono (2015) findings. The study went further to establish the reason for this by reviewing the relevance of subjects offered in UoE Automotive Technology curriculum to job

market requirements. Table 4.7 presents the analysis of the results which compares the Automotive Technology subjects offered in the UoE and those offered in TTIs.

Table 4. 6: Responses on how Automotive Technology curriculum prepares students to teach theory lessons

Behavior	Not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Engine technology	0.0	9.5	0.0	76.2	14.3	4.0
Vehicle technology	0.0	4.8	0.0	64.3	31.0	4.2
Technical drawing and design	2.4	21.4	0.0	40.5	35.7	3.9
Technical drawing and sketching	7.1	26.2	0.0	38.1	28.6	3.6
Thermodynamics	0.0	7.1	0.0	57.1	35.7	4.2
Vehicle body works	42.9	52.4	0.0	4.8	0.0	1.7
Strength of materials	0.0	11.9	0.0	61.9	26.2	4.0
Fluid mechanics	0.0	7.1	0.0	40.5	52.4	4.4
Kinetics and kinematics	2.4	33.3	0.0	54.8	9.5	3.4
Engineering mathematics	2.4	21.4	0.0	45.2	31.0	3.8
Engineering materials	0.0	7.1	0.0	47.6	45.2	4.3
Workshop organization and management	0.0	11.9	0.0	47.6	40.5	4.2

Source: Field data. $X \geq 3.00$ Agree

From table 4.7 it is evident that the UoE Automotive Technology curriculum offers some courses that are not found in the job market. None the less the courses help the students to be better practitioners. Also data in table 4.7 indicate that the UoE Technology Education curriculum is void of subjects like vehicle body work technology, computer aided design, electrical and electronic principles and control

system. The omission of these subjects is the reason why the respondents had no knowledge of vehicle body theory because curriculum is not fully meeting the job market demand. This finding agrees with Rono (2015) finding. This inadequacy on the part of the curriculum is a major contributor to producing ill-prepared graduates. Among the causes of omission of some subjects in the UoE curriculum is the lack of touch of the UoE with the job market dynamics. Because of the weak linkage UoE Technology Education Department has with the job market it is hard for the university to exactly know the demands of the job market. Also, lack of touch of the UoE Automotive Technology lecturers with the job market dynamics affects the prospects of the curriculum being relevant to the job market. Lecturers are the implementers of the curriculum but because of their out of touch with the job market they take allot of time before they learn of changes in the job market dynamics. Other causes of omission of some subjects in the UoE curriculum include lack of clearly stated job opportunities for Technology Education graduates in the curriculum, lack of philosophy of Technology Education and lack of agreement among scholars on what to train in technology education (Axmann, 2004; Nyerere, 2009).

What to train in automotive technology is of great importance because if prospective technology education instructors are prepared for available jobs, then mediocrity is perpetuated; if they are trained for the future they may not find relevance at the present. Therefore, it is important that an intricate balance be found on what to train. This will be made possible by understating and viewing the nature of Automotive Technology education through the lens of philosophy of Automotive Technology education (Heywood, 2005). The challenge facing Teacher Educators is to design Technology Education curriculum that is future-oriented yet provides its graduates with the ability to teach Technology Education and practice in the existing school and

industrial environments.

Table 4. 7: Relationship between automotive technology subjects offered in UoE and in Technical Training Institution

Technical Subject offered in the UoE	Technical Subject offered in the TTIs
Computer techniques	Information communication technology
Mathematics	Mathematics
Basic physics, basic chemistry	Mechanical science
**	Electrical and electronic principles
Technical drawing	Basic engineering drawing
Engineering materials	Materials technology and metallurgy
Metals technology and practice	Workshop technology
Power mechanics and practice	Vehicle technology
Solid and structural mechanics	Strength of materials
Kinematics	Mechanics of machines
Workshop planning and management	Industrial organization and management
Power mechanics and practice	Engine technology
**	Vehicle body work
**	Computer aided design
Thermodynamics	Thermodynamics
Fluid mechanics	Fluid mechanics
**	Control system and instrumentation
Auto electrics	Auto electrics and electronics
Industrial attachment	Industrial attachment
Engineering design	**

Technical Subject offered in the UoE	Technical Subject offered in the TTIs
Diesel mechanics	**
**	Driving lessons
History, problems and trends in technology	**
Project	Project

Source: Document analysis data **= No matching subjects

4.5.2 How Automotive Technology curriculum prepared students to teach practical lessons in automotive

Table 4.8 presents the responses on the extent to which automotive technology curriculum prepared students to teach practical lessons in automotive. The respondents' ratings are in agreement that Automotive Technology curriculum assisted them to learn teach practical lessons in only workshop organization and management. This is because the practical domain of workshop organization and management can be taught through pictures and electronic educational media. Also this is usually practically done in the industries. As the students proceed for attachment they are able to see how the production chain is arranged for easy flow of the work. The industrial attachment experience enables the students to reconcile what they learned in class with real field experience (Ferej, 2012).

For Automotive Technology technical teacher to be relevant to the world of work he or she should be able to teach practical lessons in automotive since it is the major pillar for establishing Technical Training Institution (KIE, 2012). Since respondents lacked practical skills then Automotive Technology curriculum was found to be wanting since it did not facilitate Automotive Technology graduate to be fluent in

handling practical lessons in, engine technology, vehicle technology, technical drawing, thermodynamics, vehicle body works, strength of materials, fluid mechanics, kinetics and kinematics, engineering mathematics and engineering materials. This is the reason why Rono (2015) and this study finds automotive TVET graduates to be irrelevant to the world of work. This is because the graduates should be able to handle both the practical and the theory component of the TTI curriculum competently.

Table 4. 8:Responses on how Automotive Technology curriculum prepared students to teach practical lessons

Behavior	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Engine technology	4.8	88.1	0.0	4.8	2.4	2.1
Vehicle technology	4.8	88.1	0.0	4.8	2.4	2.1
Technical drawing and design	11.9	45.2	0.0	31.0	11.9	2.9
Technical drawing and sketching	23.8	35.7	0.0	28.6	11.9	2.7
Thermodynamics	21.4	71.4	0.0	4.8	2.4	2.0
Vehicle body works	40.5	57.4	0.0	2.4	0.0	1.6
Strength of materials	26.2	71.4	2.4	0.0	0.0	1.7
Fluid mechanics	23.8	73.8	0.0	2.4	0.0	1.8
Kinetics and kinematics	21.4	76.2	0.0	2.4	0.0	1.8
Engineering mathematics	9.5	50.0	0.0	35.7	4.8	2.8
Engineering materials	14.3	81.0	0.0	4.8	0.0	2.0
Workshop organization and management	11.9	35.7	0.0	33.3	19.0	3.1

Source: Field data. $X \geq 3.00$ Agree

Lack of the ability of the curriculum to help respondents to acquire practical skills, is an indicator that the psychomotor domain is neglected. This is partly because the

workshop is poorly equipped, poor industrial attachment assessment techniques are used and short industrial attachment period. Also poor teaching methods used by subject lecturers, lack of practical examination and poor practical evaluation criteria could lead to poor practical acquisition (Rono, 2015).

4.5.3 Strength that makes Automotive Technology curriculum relevant to the job market

Table 4.9 presents the responses on the strength that makes Automotive Technology curriculum relevant to the job market. The respondents' ratings are in agreement that Automotive Technology curriculum has several strengths that make it relevant to the job market. This are: The curriculum content accurately captures the type of duties a graduate could expect to perform in the technical institute work environment, the curriculum length is sufficient to produce graduates with the required entry level knowledge to the world of work, the Automotive Technology curriculum subjects are relevant to the job market requirement and the sequencing of training (i.e. order of courses) within the curriculum properly addressed course pre-requisites.

Also the presentation in table 4.9 reveals several weaknesses in the Automotive Technology curriculum. The ratings indicate that the respondents are of the opinion that the curriculum content did not accurately capture the types of duties an Automotive Technology graduate expected to perform in the automotive repair/manufacture industry work environment. In addition, there is no proper balance between theory and practice during training and that the length of industrial attachment was not sufficient to further build on the students' skill level already developed in class (Rono, 2015).

Table 4. 9: Responses on the strengths that makes Automotive Technology curriculum relevant to the job market

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
The curriculum content accurately captures the types of duties a graduate can expect to perform in the technical institute work environment	0.0	28.6	7.1	45.2	19.0	3.6
The curriculum content accurately captures the types of duties a graduate can expect to perform in the automotive repair/manufacture industry work environment	14.3	40.5	2.4	23.8	19.0	2.9
The curriculum length is sufficient to produce graduates with the required entry level knowledge to the world of work	0.0	40.5	0.0	38.1	21.4	3.4
The Automotive Technology curriculum subjects are relevant to the job market requirement	0.0	19.0	0.0	54.8	26.2	3.9
Does the sequencing of training (i.e. order of courses) within the curriculum properly address course pre-requisites?	0.0	33.3	9.5	42.9	14.3	3.4
Do you feel that there is a proper balance between theory and practice during training	23.8	61.9	2.4	9.5	2.4	2.1
The length of industrial attachment is sufficient to further build on the students' skill level already developed in class?	45.2	31.0	0.0	23.8	0.0	2.1

Source: Field data. $X \geq 3.00$ Agree

From table 4.9 the lack of industrial domain in UoE Automotive Technology curriculum is a gross omission. This is the main reasons why the respondents found it

difficult to train technical institutes' graduates for the industry because they lack the same expertise. A teacher who is not skilled in production process is not able to instruct practical courses (MoE, 2000).

That is to say, a doctor should train a doctor, an engineer should train an engineer and so it should follow that an automotive technologist should train an automotive technician and/or technologist. Therefore, the major undoing of the UoE Automotive Technology curriculum is that it is preparing teachers to train technicians for the industry. Instead, the curriculum should be training technologists with teaching skills to train technicians for the industry

4.6 To investigate the relevance of Automotive Technology Education curriculum materials to the job market requirement.

Table 4.10 presents the responses to the questionnaire item; how relevant is the Automotive Technology curriculum materials to the job market requirements? The respondent ratings are in agreement that Automotive Technology curriculum materials are relevant to the job market only in two premises. Namely, the respondents are of the opinion that the entry behavior of the Automotive Technology students is relevant to the job market and that the available Automotive Technology textbooks are relevant for Automotive Technology curriculum delivery. Education is a system and in a system the input of the system determines the output quality of the system (Heywood, 2005). Thus the respondents feel that the input criteria used to admit the students in to Technology Education is satisfactory.

Table 4. 10: Responses on the question: How relevant are the Automotive Technology curriculum materials to the job market requirement?

Behavior	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
The curriculum current admission requirements will ensure that students will have the basic knowledge required.	0.0	26.2	2.4	45.2	26.2	3.7
The tools, equipment and supplies listed for practical components of the curriculum are satisfactory for curriculum delivery.	11.9	42.9	9.4	26.2	9.5	2.8
The curriculum textbooks are relevant for Automotive Technology curriculum delivery	7.1	31.0	0.0	59.5	2.4	3.2
There is adequate learning resources (i.e. print media, audio-visual materials, etc.) provided for curriculum delivery.	19.0	73.8	0.0	7.1	0.0	2.0
The instruction is reinforced with appropriate technologies to prepare a technologically relevant teacher.	54.8	38.1	0.0	4.8	2.4	1.6

Source: Field data. $X \geq 3.00$ Agree

For Automotive Technology Teacher Preparation curriculum to be relevant to the world of work, it must have relevant teaching materials (Kafu, 2012). It is on the following accounts that Automotive Technology curriculum is found to be irrelevant to the job market, that is, the curriculum has unsatisfactory tools and equipment supplies listed for delivery of practical components of the curriculum. Also, there are inadequate learning resources (these are print media and electronic materials) provided for curriculum deliver and the teaching instructions are not reinforced with appropriate technologies (like On-Board Diagnostic kit, Computer Aided Design software's, equipment, etc.) to prepare a technologically relevant teacher.

Automotive technology being a practical subject, the study investigated the quality of the UoE workshops as they constitute one of the key training materials (Kafu.2012). This was done by participation and observation. The data is presented in observation themes as follows:

General location of the workshop

The UoE automotive workshop is poorly located in relation to the main building. This is because it is located very close to the administration offices and learning classroom, and normal running of the workshop could easily interfere with classes and administration of the university. This is because most of the workshop operation produces high pitched noise. Therefore the workshop should be located far away from classrooms. Also the workshop is not appropriately located in relation to other workshops. This is because its current location could hinder the flow of work processes that require to be completed from different workshops. This may lead to time wastage and extra expenses if specialized equipment is employed to transport the work pieces. To counter this challenge the workshops should be located in a central place and preferably arranged according to work flow.

The workshop is excellently located in-terms of accessibility. This is because the workshop is served by a tarmacked road from the main road that allows easy access of deliveries. However, the workshop itself is very small for it to allow reasonable work to be done in it. This could easily affect the quality of work especially if it required high level of precision and cleanliness.

The workshop space

The workshop is poorly designed with very small total floor area. This has resulted to congestion of the tools in the workshop. The ceiling height is short and thus can’t

allow work pieces of eight feet and above to be worked on in the workshop. These inadequacies could lead to injuries and poor learning environment due to congestion and suffocation. Since the trainees will be learning under fear, the learning objectives will not be achieved as the trainees will be concerned of their security more than learning. From the interview data the facility was not meant for Automotive Technology workshop. This is why it does not meet the basic requirements of a workshop according to the building and construction code.

Floor Surface treatment

The workshop floor has no potholes and is nicely done with terrazzo. The floor material is of appropriate friction to prevent slipping. The wall is built using concrete and motor and the ceiling is also properly done using concrete and motor since the workshop is located at the basement. The wall and ceiling is painted with oil based paint with is flammable. This is not appropriate as the walls and ceiling should be painted with fireproof paints. This will enable the student to be assured of their safety. A safe environment enhances learning as the learners will not be worried of their safety (Brown, 2006).

Workshop Doors

The students use a single door for access and exit. This is contrary to the workshop safety rules and procedures (University of Wollongong, 2011). The workshop safety rules stipulate that different doors should be used for access and exit (University of Wollongong, 2011). This is done to ensure safety of all personnel in the workshop. The door is in good condition and is properly located. The size of the door is also appropriate as it may allow a vehicle to be driven into the workshop and the door is in

good serviceable condition. However, the emergency door is of very small size and poorly located. The location and size of the door could easily cause a stampede in case of emergencies. This is because the door would be too small to allow quick and safe evacuation. In addition, the emergency door is leading to other rooms instead of open air. Also the emergency door was not well labeled and at the time of the observation access to it was denied by work pieces.

Workshop Windows

The windows are appropriately located although they are of very small size and located only on one side of the wall. This made the windows not to be able to control natural light due to its minimal number per unit area. They are also located very high on the wall that leads to poor lighting and ventilation especially where dangerous denser gases are involved. This could lead to health hazard of both the students and the instructors. Thus, the workshop environment was not conducive for learning.

Heating, Ventilation and cooling of the workshop

Due to geographical location of the University of Eldoret forced heating and cooling is not necessary. This could easily be achieved by the use of appropriate doors and window sizes. As per the time of the observation, heating and cooling was not fully achievable due to the small window sizes and window number per unit area. This made the learning environment in the workshop not conducive for learning.

At the time of the observation, ventilation was not adequately done due to few window numbers per unit area. This led to poor air circulation and dust control. The situation was made worse by lack of air purification machines and system. This could

affect the ability of the students to work in the workshop and to some extent some students may develop negative attitudes towards workshops.

Illumination of the workshop

The general lighting of the workshop is not good. This could be attributed to few windows to provide natural lighting and also the lack of mechanism to control the light intensity from the natural lighting system. The situation is not made any better by the artificial lighting system. This is because the lighting system is centrally located thus not lighting the extreme ends of the workshop. Also all the artificial lights are permanently secured and thus could not be moved to illuminate hidden areas like beneath the vehicle.

Electrical servicing of the workshop

Electrical system is available and in satisfactory serviceable condition. The workshop is supplied with three phase power and has convenience outlets. The outlets are adequate in number bearing in mind the small size of the workshop. Also the power outlets are well located close to the service benches, of good height from the ground and fitted with machine connections that are easy to connect.

It is worth noting that the power outlets have no surge protectors and are not flexible thus making them prone to failure due to power surge and difficult to relocate. Due to lack of flexibility of the power outlets, the power cannot be moved closer to the work piece thus calling for long extension cables which might bring in safety problems. Further, the electrical system lacks master control with multiple shut-off locations for easy control from different points and for safety measures during emergency.

Other workshop utilities

The workshop lacks work benches, demonstration benches, compressed air, water (Personal washing and drinking fountains) and servicing bays.

Major Area considerations of the workshop environment

The workshop is very small and poorly organized for instruction and teaching to take place. The workshop instruction materials are very poorly organized putting the life of the students in great danger. Also due to the poor organization of the workshop there is very little space left for students to seat forcing some of them to hang dangerously on machines and practical materials during lessons. The instructor is also greatly limited to attend to individual students due to poor student accessibility caused by poor workshop organization. The workshop design also limits its ability to have educational media capabilities. It is difficult for the instructors to use educational media during teaching due to limited space and lack of demonstration benches. Also the workshop organization limits instructors from using ICT during teaching because of lack of space to project demonstration materials.

The workshop is equipped with instructor's office although awkwardly located between a computer room and the workshop. The instructor's office is very small and also serves as tool room, preparation room and a store. This left the instructor with very minimal space to prepare for lessons. Also the lack of workshop stores make it very difficult for the instructor's to store students projects, potable tools and teaching materials. Lack of store for storage left the project scattered all over the workshop and may have made the student to wonder about the usefulness of the project anyway. This sends a very negative message to the students and could have made them not to

take their project work seriously. The problem is wrapped up by the fact that the students learn workshop organization and management but their model workshop is a poor one.

From observation, working in the workshop is not made easy because the workshop lacks finishing rooms, display areas for the students to show case their work, production assembly area, workshop library equipped with reference materials, workshop manuals and adequate instructional materials. Lack of this fundamental educational media might have led to poor preparation of the trainees especially in psychomotor skills. Also the ability of the instructors to see all areas from any position in the workshop is impaired by the poor organization of the workshop. Lack of this ability by the technician may have led to poor training and by extension ill-prepared graduates.

Equipment/machines in the workshop

At the time of observation the workshop was poorly equipped. The workshop was inadequate to facilitate meaningful instruction to the trainees. In fact the practical lessons were reduced to theory lessons where the instructors taught practical work theoretically. The students were reduced to passive participants instead of active participant. It was also observed that the students did not dress in workshop attire and broke all the workshop rules and regulation during practical lessons. This made the workshop inappropriate for anticipated use envisaged by the curriculum.

Also, due to the small size of the workshop, lack of workshop hand tools, machines and work stations the workshop did not meet the physical needs of all the students. This could easily be realized as some of the students were involved in playing around

the workshop as the instructor was heavily surrounded by eager students and could not have a view of every corner of the workshop. Also some interested students were hanging dangerously on the old John Deere tractor in the workshop so that they could catch a glimpse of what the instructor was demonstrating and explaining.

The few available teaching materials and equipment in the workshop are poorly organized and are not in good serviceable condition. In addition, the placement of equipment's in the workshop was done haphazardly and not according to the recommended workshop sequential placement that is guided by easiness of workflow. These make the work area unsafe for the machine operator. If the workshop remains poorly equipped the graduates produced will continue to be ill-prepared in psychomotor skills. This is because the graduates will lack appropriate attitude, work ethics, workshop practice and practical experience required by the job market.

Traffic analysis of the workshop

The human traffic in the workshop is in its worst scenario. The aisle is not provided and the situation is not made any better by the poor organization of the workshop. This does not allow good traffic flow in the workshop and more often than not the students lean dangerously on machines to allow others to pass or to find their way to the next workstation. The spacing between the available machines is poorly done thus further restricting traffic flow. In addition the machines and equipment are not placed according to sequential use of the machines increasing traffic movement in the workshop. This environment is not conducive for proper training and could be the contributing factor to ill-prepared graduates as most of the time is wasted in movement. Also, the instructor cannot attend to individual needs of the students due to traffic restrictions.

Safety of the workshop

At the time of observation, safety of the students was not put in place. The machines available lacked machine guards, safety color codes, equipment parts and the workshop safety zones had not been identified and marked. The fire detectors and fire alarm system were not working and the alarm safety glasses had been broken. The fire extinguishers were not put in place and the workshop lacked fire proof storage for specialized equipment and materials. Also, the workshop lacked automatic sprinkler system and first aid kit that could be used in case of fire out-breaks. It was also noticed that the workshop lacked waste storage. The waste was dangerously scattered on the floor thus a safety hazard to the students. Also the design and arrangement of equipment in the workshop did not take care of students with special needs. This omission placed the special need students at a more dangerous environment. Lack of safety could easily cause anxiety and fear during practical classes. This will make the students not to participate wholly during the practical lessons and thus leading to ill-preparedness for the world of work.

A properly designed and equipped workshop should assist students in the completion of instructional objectives. This is because essentially, learning takes place through the experiences which the learner has, that is, through the reactions he makes to the environment in which he is placed (Tyler, 1949). From observational data it is clear that the Automotive Technology curriculum lacks strong support of relevant curriculum materials. The workshops are insufficiently equipped, poorly organized and designed to support any meaningful implementation of the Automotive Technology curriculum. The workshop lacks both basic and specialized instructional materials and equipment for training Automotive Technology. These inadequacies in

the workshop may contribute to a great extent in producing ill-prepared Automotive Technology graduates as they lack practical competencies.

Further, the UoE workshop lacks simple basic tools and machines which question the commitment of the curriculum implementers in meeting job market requirements. The acute inadequacies of the teaching materials may be attributed to be among the main contributing factors for the curriculum not meeting the job market requirements.

However well theory content in Automotive Technology is presented to the learners, the graduates will remain ill-prepared because they lack practical skills demanded by the job market. This is because, for example, the Automotive Technology graduates are required by the job market to teach among others artisan courses that call for ninety percent practical. This will lead to mediocre teaching because the Automotive Technology graduates lack psychomotor skills to handle such a curriculum. This inadequacy of the automotive technology graduates will perpetrate mediocrity to their students and by extension generating a vicious cycle of patchiness. This could explain why despite the fact that respondents found the curriculum theory content relevant to the job market, they still maintained that the curricula delivery is not relevant to the job market due to its lack of practical domain. This makes the Automotive Technology curriculum inadequate to meet the job market requirements.

4.7 To what extent do the teaching methods affect the relevance of Automotive Technology program to the job market requirements?

This research question is addressed by two questionnaire items which are discussed in this section separately for the purpose of clarity.

4.7.1 Extent to which the stated experiences contributed to making graduates more relevant to the job market.

Table 4.11 presents responses on the extent to which varied experiences contributed to making respondents more relevant to the job market.

Table 4. 11: Responses on experiences contributing to making graduates more relevant to the job market

Behavior	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Sitting CATs	0.0	31.0	0.0	31.0	38.1	3.8
Take away assignment	0.0	33.3	33.3	33.3	0.0	3.7
Workshop practice	4.8	35.7	0.0	28.6	31.0	3.5
Industrial attachment	4.8	14.3	0.0	40.5	40.5	4.0
Supplementary exams	19.0	33.3	11.9	16.7	19.0	2.8
Final Exams	0.0	19.0	2.4	35.7	42.9	4.0
Final year project	7.1	4.8	0.0	47.6	40.5	4.1
Academic Field trips	23.8	9.5	0.0	26.2	40.5	3.5
Teacher centered teaching(lecture method)	2.4	33.3	0.0	38.1	26.2	3.5
Learner centered methods	2.4	14.3	0.0	42.9	40.5	4.1
Group discussion	7.1	14.3	0.0	40.5	38.1	3.9
Own reading and learning	4.8	9.5	2.4	38.1	45.2	4.1
Library textbooks	2.4	38.1	2.4	31.0	26.2	3.4
Internet	16.7	16.7	0.0	21.4	45.2	3.6

Source: Field data. $X \geq 3.00$ Agree

The respondents ratings are in agreement that sit-in continuous assessment tests (CATs), take away assignment, workshop practice, industrial attachment, final examination, final year project, academic field trips, teacher centered teaching, learner centered methods, group discussion, own reading and learning, library textbooks and internet contributed to making the graduates more relevant to the job market. It is worth noting that the respondents agreed that supplementary examination did not contribute in making a graduate more relevant to the job market.

Teacher trainees learn by imitating their teachers as they are their role models (Tyler, 1949). Therefore, the teaching method used by the teacher will affect the understanding and teaching methods employed by the teacher trainee (Heywood, 2000). A student teacher who has good mastery of content and conception of learning is most likely to be a good teacher (Heywood, 2000). University of Eldoret teachers use a variety of teaching methods but the respondents are of the opinion that supplementary exams did little in making trainees relevant to the job market. This may be because when students fail practical examination which is marked out of 20% they are asked to take a supplementary examination in theory. This way, however good the examiner may have set the supplementary examination; it would not have addressed the course of the poor performance.

Clearly, if students were to overcome the misconceptions they have about Automotive Technology concepts, then a deep learning approach should be encouraged (Heywood, 2000). In this situation a traditional lecture approach and supplementary exams, however good the lecturer or examiner may not be adequate (Heywood, 2005). This is the reason why in table 4.11 the respondents preferred learner-centered teaching methods for practical lessons to teacher-centered teaching method

Also, from table 4.11 the respondents cited own reading, learner-centered methods, final examinations and final year project as the methods that may contribute greatly to making graduates relevant to the job market requirement. This observation leads to the big question: Which way to go in Technology Education, Do we train, teach or coach? A close analysis of respondents preferences reveal that the 21st century students may want to be guided on how to generate knowledge rather than to be fed with knowledge. This is a good recipe for lifelong learning in the rapidly changing technological environment. Automotive Technology curriculum aims can be achieved through raising the quality and relevance of TVET program by developing relevant curriculum methodologies and the provision of essential technologies and materials to reinforce the methodologies employed.

4.7.2 Respondents feeling about the curriculum content and instructional materials

Table 4.12 presents the responses on the item requesting the respondents to state their feelings about the curriculum content and instructional materials. It is clear from the responses that the respondents feel that the available curriculum content and instructional materials are inadequate. That is, the available curriculum instructional materials for Automotive Technology did not model appropriate work habits for the Technical Training institutions (TTIs) and the automotive repair industry job market.

Also, the respondents indicated that the Automotive Technology curriculum content/learning activity is not consistent with TTIs and automotive repair industry job market practices. This indicates clearly that the respondents feel that the Automotive Technology curriculum learning activities are not relevant to the automotive repair industry. This is contrary to the government intended purpose of Technical and Vocational education which is to equip youth with knowledge and

skills for self-reliant (Nyerere, 2009). Furthermore it will be a waste of time to teach UoE automotive technology education graduates entrepreneurship courses and yet they don't have skills to repair vehicle that would enable them establish garages (Ferej, 2012).

Table 4. 12: Responses on the question: What is your feeling about the stated statements?

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Do you feel that available curriculum instructional materials for Automotive Technology model appropriate work habits for the TTI job market?	14.3	61.9	4.8	19.0	0.0	2.3
Do you feel that available curriculum instructional materials for Automotive Technology model appropriate work habits for the automotive repair Industry job market?	19.0	61.9	0.0	16.7	2.4	2.2
Do you feel that the Automotive Technology curriculum content/learning activities are consistent with technical institute's job market practices?	7.1	45.2	4.8	33.3	9.5	2.9
Do you feel that the Automotive Technology curriculum content/learning activities are consistent with Automotive repair industry job market practices?	9.5	45.2	2.4	38.1	4.8	2.8

Source: Field data. $X \geq 3.00$ Agree

4.8 Extent of the curriculum evaluation mechanism effectiveness to ensuring relevance of Automotive Technology to the job market

Table 4.13 presents the responses from a questionnaire item. From the results the respondents rating are in agreement that sit-in examination evaluation used for Automotive Technology curriculum are appropriate to the job market. This is because examinations encourage the students to read and in the process they become richer in theoretical knowledge which makes them better Automotive Technology teachers (Mehrens & Lehmann, 1991). This is the same impact practical examination will have on the students if it is introduced. Also the respondents felt that graduates of this curriculum should be registered with both Teachers Service Commission (TSC) and a professional body for technologist. This is because the respondents felt that if they are registered by both professional bodies they will be allowed to teach in class and practice in the industry and thus gain practical skills necessary for one to be an effective practical teacher (Grollmann & Rauner, 2006). Also the respondents felt that the passing grade requirements for successful completion of the curriculum are sufficient to the job market requirements. This implies that the minimum requirement for one to be allowed to go and practice in the field is sufficient enough to discriminate between competent graduates from incompetent graduates.

Further analysis of the responses indicates that the respondents think that supplementary examinations and take away assignments as evaluation tools are not appropriate to the job market. Also the respondents feel that there is inadequate balance between theoretical and practical assessments in Automotive Technology program (Rono, 2015). Further, the respondents' rate industrial attachment period and the final project as not sufficient to the job market requirement.

Throughout the data, tables 4.11, 4.12 and 4.13, the respondents have consistently indicated that supplementary examination evaluation used is not relevant to the job

market requirement. The respondents also felt that take away assignments, practical assessments, industrial attachment assessments and final project assessments employed irrelevant evaluation criteria to the job market requirements. A close analysis of these phenomena indicates that the evaluation criteria used are the ones that make the exercises irrelevant to the job market but not the exercises in themselves. This is because; in the case of take away assignments the students download the assignments from the internet and present it for evaluation even without reading through it. Further, the students would copy the assignments from the colleagues and these could be some of the reasons why the respondents found assignments as an evaluation tool irrelevant.

In the case of assessment of practical, the evaluation process is flouted as the practicals are conducted theoretically and the assessment only serves to formalize the evaluation process. The students are examined theoretically in a practical examination. This may be the reason why the respondents found this practical assessment not being relevant to the job market. This is because the assessment procedure used is contrary to the recommended procedure where the students should be assessed while conducting the real practice (Ferej, 2012). This way the assessors will be able to judge both the true hard and soft skills of the students. For the case of industrial attachment assessments the students are assessed through report writing which could easily be manipulated. Also the lecturers and technicians visited the students on industrial attachment at their places of industrial attachment averagely once and for very few minutes. This undermines the whole purpose of assessment and dramatized an already flouted process. This is the reasons why the respondents in this study felt that industrial attachment assessment requirements for completion were not sufficient.

Table 4. 13: Responses on the item: To what extend do you agree with the following statements

Behavior/percentage	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Supplementary exam evaluation used for Automotive Technology curriculum is appropriate to the job market	16.7	42.9	11.9	26.2	2.4	2.6
Take away assignment evaluation used for this curriculum is appropriate to the job market	9.5	42.9	2.4	31.0	14.3	3.0
Sitting exams evaluation used for Automotive Technology curriculum are appropriate to the job market	4.8	23.8	0.0	42.9	28.6	3.7
There is an adequate balance between theoretical and practical assessments in Automotive Technology program	23.8	47.6	0.0	19.0	9.5	2.4
The industrial attachment requirement for successful completion of the curriculum is sufficient.	9.5	47.6	0.0	35.7	7.1	2.8
The final project requirement for successful completion of the curriculum is sufficient.	7.1	54.8	0.0	26.2	11.9	2.8
The passing grade requirements for successful completion of the curriculum are sufficient.	0.0	21.4	0.0	45.2	33.3	3.9
The graduate of this curriculum should be registered by the engineering regulation board	4.8	4.8	0.0	28.6	61.9	4.4

Source: Field data. $X \geq 3.00$ Agree

Equally, for the case of final year project the students are not well prepared by the curriculum and lecturers on how to carry out projects yet they are required to produce an innovative working project. Further, the university does not facilitate the students

financially leading to inability of the students to carry out the projects to completion. In full understanding of the circumstantial problems the students face while carrying out the project, the project assessors compromise the project quality. Conversely, the projects that the students undertake have little relevance in solving existing industrial problems. This is happening despite Nyongesa (2011) and Some (2011) recommendation that students projects should be linked with industry requirements and should have relevance in solving industry-based problems.

The Automotive Technology curriculum lacks specific stated criteria and tools of assessment dedicated to evaluating the Automotive Technology curriculum against the job market requirements. In engineering the function of quality assurance is performed by the University senate and the Engineers Board of Kenya (EBK). For Technical Education, the dimension of quality is vested in the university senate only and the professional dimension is vested in the professional institutions acting through the Teacher's Service Commission (TSC). Unfortunately, TSC is not recognized by Automotive Manufactures, Transport and Repair Industries as an authority in Technical quality assurance. This has placed the automotive technology student in an awkward position as they cannot secure industrial attachment position to sharpen there practical skills. The situation is also addressed by Ogola, Ondieki and Akumu (2014) in their study "Re-Orienting Engineering profession Bodies Towards Industrialization for Sustainable Development in Kenya" and concluded that although EBK regulates engineering profession and provides very deterrent penalties for offering employment to persons not registered with EBK, the functions and the powers of the board do not mention anything about Technology Teachers who form part of a key stakeholder in training of Artisans, Craftsmen and women and Technicians. The observation is not unique to Kenya as in Malaysia (2016) strategic

plan titled Transforming Technical and Vocational Education and Training to Meet Industry Demand observed that the main challenge in TVET is that graduate teachers are classified as technologists but are not registered by Board of Engineers Malaysia (BEM) as professionals under the Registration of Engineers Act, 1967. As such, technical teachers do not have professional status and hence cannot demand for higher wages or work in industry so as to gain industrial experience. As a result most TVET teachers do not have the prerequisite industrial experience required to teach in technical institution.

From Ogola, Ondieki and Akumu (2014) conclusion, what is clearly left out is the role played by the EBK in regulating Technical Education since these teachers are going to teach engineering courses in Technical Institutions. It is imperative that TSC works with Engineers Board of Kenya in maintaining quality in TVET. Also Automotive Technology teachers need professional recognition in TVET so as to be able to work in industries in order to gain practical competence to teach practical's in class. These are the same reasons Ogola, Ondieki and Akumu (2014) based on while establishing a body known as Institute of Engineering Technologists and Technicians (IET) so as to address problems facing Technical Education programs. Also, TVETA act 2012 demands that Automotive Technology teachers should be registered or registerable by a relevant professional body for them to be allowed to practice as technical teachers.

Recognition of Automotive Technology education graduates only by TSC and not both TSC and EBK has really affecting the job prospects of the Technology Education students and narrowing them only to classroom teaching. With the increasing rate of unemployment in Kenya and the nature of Automotive Technology

education training and working conditions, both TSC and EBK should recognize the Automotive Technology graduates to improve their job prospects and industrial linkage. Item number fourteen in the questionnaire sought to find out the occupational position(s) for which automotive technology graduates would have wished to be considered for employment after successful completion of the course. The emerging occupations from the responses to this question were workshop manager, fleet manager and transport manager. Also the respondents wished to be employed as automotive lecturer, system analyst and field service mechanic. Equally, respondents wished to be employed as automotive engineer. Also, stating own garage featured in the wish list of the respondents. Most of the mentioned positions the respondent might not hold without being registered or registerable by EBK despite the fact that they are already recognized by TSC.

Also lack of a committed professional body regulating Technical Education quality in Kenya could be a main contributing factor to the poor practical ability demonstrated by the Automotive Technology graduates. This is because there is no Technical professional body regulating Technical Education quality in Kenya. For example in Germany and China one has to be a practicing engineer trained in pedagogy to be allowed to teach practical lessons in TVET institutions (Zhao & Lianwei, 2006). This means that they are registered as both engineers and teachers. This might be the reason why Automotive Technology graduates overwhelmingly are of the opinion that they should be registered with both Teachers Service Commission (TSC) and the Engineers Board of Kenya (EBK). This will make it possible to regulate the quality of Automotive Technology graduates both in classroom and in industry. The registration will also open a broader market for the Automotive Technology graduates and broaden the scope of application of their knowledge and capabilities.

4.9 Overall, is Automotive Technology curriculum relevant to the job market?

Table 4.14, presents the results of the response to the relevance of core subjects to the job market.

Table 4. 14: Relevance of core subjects to the job market

	Frequency	Percent	Cumulative Percent
Extremely relevant	12	28.6	28.6
Moderately relevant	26	61.9	90.5
Slightly relevant	1	2.4	92.9
Moderately irrelevant	2	4.8	97.6
Extremely irrelevant	1	2.4	100
Total	42	100	

Source: Field data

From table 4.14, (61.9%) of the respondents feel that Automotive Technology curriculum is moderately relevant. This means that in a likert scale of one to five, majority of the students were scoring a four. This implies that the respondents find that the market needs graduates of Technology Education. Actually, the respondents feel that there is a ready market for Technology Education graduates only that the market is complaining that the graduates are not well prepared to satisfy the market needs (Rono, 2015). A further (28.6%) feel that the Automotive Technology curriculum is extremely relevant to the job market. Therefore, it is clear that (90.5%) of the responded are of the opinion that Automotive Technology curriculum core subjects are relevant to the job market. Only (7.2%) feel that Automotive Technology curriculum is irrelevant to the job market requirement. Table 4.15, presents the results of the response to the relevance of professional educational subjects to the job market.

Table 4. 15: Relevance of professional educational subjects to the job market

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely relevant	14	33.3	33.3	33.3
Moderately relevant	19	45.2	45.2	78.6
Slightly relevant	5	11.9	11.9	90.5
Slightly irrelevant	1	2.4	2.4	92.9
Moderately irrelevant	2	4.8	4.8	97.6
Extremely irrelevant	1	2.4	2.4	100
Total	42	100	100	

Source: Field data

From Table 4.15, (45.2%) of the respondents feel that the professional educational courses are moderately relevant to the job market demand. This implies that the respondents feel that pedagogy was important and assisted them to carry out their duty as teachers in TTIs. The reason why most of the respondents feel that it was moderately important is because they are frustrated that they have the teaching skills but they lack the mastery of teaching of practical subjects.

Also (33.3%) of the respondent feel that the educational professional courses are extremely relevant to the job market. This implies that the respondents feel that professional educational courses met the job market requirement. The reason why the number of the respondents holding this view is slightly low is because most of the respondents feel that a lot of emphasis and time has been directed to professional causes at the expenses of the practical skills. Therefore, educators must strive to strike

a balance between teaching of pedagogy and practical subjects. Only (9.6%) respondents are of the opinion that the professional courses are irrelevant to the job market. These are the group of respondents who hold that one can be a teacher without training in pedagogy. This implies that the teachers of professional educational courses should strive to make sure that the students appreciate the role played by educational professional courses in the job market.

4.10 Challenges facing effective preparation of relevant Automotive Technology graduates for the world of work

Table 4.16 shows the extent to which the sampled curriculum challenges affect effective preparation of relevant Automotive Technology graduates for the world of work. From the respondent's perception, it is clear that the low student motivation, student entry behavior and curriculum goals not being clearly stated, influence greatly ineffective preparation of relevant Automotive Technology graduates. Also, inadequacy in the syllabus, absenteeism of lectures, lack of enough curriculum teaching materials, large class sizes during lectures, weak linkages with job market, poor teaching methodologies and poor administration of examination (cheating in examinations) negatively affected the quality of Automotive Technology. Further, the respondents indicated that incompetent lecturers, too much non-teaching duties on the subject lecturers, absenteeism of students and too much stress on examination did not contribute significantly towards producing ill-prepared graduates.

In the past decade, TVET has grown enormously in Kenya; however, in the process it has equally encountered many challenges in recent years. From the generated findings in table 4.16 there is agreement among respondents that the low student motivation is a challenge. This could be attributed to the fact that most of the students are forced by

the admission body to take the Automotive Technology course during admission (Ochuotho & Kitainge, 2016). In addition, during course selection for specialization the same vice is perpetrated (Katumbi, 2016). Some of the students are forced to take a specialty against their will. This occurrence really affects the student motivation. This is why TVETA Act (2012) suggests that the government should re-brand and reposition TVET to be a sector of choice for candidates.

The entry behavior is also a challenge in the sense that most students have not learnt Technical subjects at high school level unlike sciences like Physics, Biology, Mathematics and Chemistry which are learnt all the way from high school. It should be made mandatory that one ought to have done automotive in high school and scored a minimum of C+ for one to qualify to pursue Automotive Technology education at University of Eldoret. This should be done because the university training period is limited to four years only and there is no time to cover pre-requisite knowledge. This is paramount because the poor entry behavior will continue to contribute to ill-prepared graduates as the in-put quality determines the out-put quality since education is a system. Also there is agreement among the respondents that goals of the curriculum are not clearly stated. This poses a great challenge to attaining relevance of Automotive Technology curriculum. This is because the students lack direction on what is expected of them at the end of the course. This also denies the students the chance to carry out self-assessments tests as they lack the reference on which to measure themselves against. The curriculum content is inadequate as the respondents report in table 4.7 that some key knowledge areas are omitted from the curriculum. These include Vehicle Body Works, Electrical Principles, Driving and Computer Aided Design. This omission could be the contributing factor of the respondents' inability to meet the market requirements.

Table 4. 16: Responses on the extent to which the following experiences contributed to making graduates more relevant to the job market

Behavior	not at all	To a little extent	I don't know	To a great extent	To a very great extent	X Mean
Low student motivation	2.4	42.9	2.4	23.8	28.6	3.3
Entrance behavior	19.0	21.4	9.5	28.6	21.4	3.1
Too much stress on examination	4.8	61.9	4.8	16.7	11.9	2.7
Curriculum goals not stated clearly	0.0	21.4	7.1	45.2	26.2	3.8
In adequacy in the syllabus	0.0	19.0	0.0	54.8	26.2	3.9
Too much noon teaching duties on the subject lecturers	9.5	40.5	9.5	23.8	16.7	3.0
Absenteeism of lecturers	4.8	42.9	2.4	23.8	26.2	3.2
Absenteeism of students	11.9	42.9	4.8	26.2	14.3	2.9
Lack of enough curriculum teaching materials	2.4	14.3	0.0	42.9	40.5	4.1
Irrelevant curriculum materials	19.0	28.6	7.1	26.2	19.0	3.0
Incompetent lecturers	21.4	33.3	2.4	26.2	16.7	2.8
Large class sizes during lecturers	16.7	21.4	2.4	31.0	28.6	3.3
Weak linkages with job market	7.1	14.3	0.0	47.6	31.0	3.8
Poor teaching methodologies	9.5	40.5	0.0	38.1	11.9	3.0
Poor administration of examination (cheating in exams)	0.0	14.3	0.0	40.5	45.2	4.2

Source: Field data. $X \geq 3.00$ Agree

The inadequacy of the curriculum is not made any better by subject lecturers' absenteeism. This implies that the syllabus cannot be completely covered and if it is,

it is done in patches. This affects the quality of the Automotive Technology graduates. The respondents add on that lecturers cover the syllabus in patches with full knowledge that they are the examiners. The lecturers teach for examination purposes and not for knowledge sake. Therefore the empirical importance of vocational learning as a bridge between the working world and the education system is overshadowed by the big emphasis society puts on academic education and examination credits (Grollmann & Rauner, 2006). Also, due to lack of enough time to deliver content most lecturers resort to crude teaching methods which may be adopted by the teacher trainees (Tyler, 1949). This is why most respondents voiced that the lecturers should improve their teaching methods.

Large class size during lectures is also a challenge facing delivery of Automotive Technology curriculum (Rono, 2015). This challenge is aggravated by lack of enough educational resources, teaching staff and weak linkage of the curriculum to the job market. This challenge may take part of the responsibility of producing ill-prepared graduates.

Teaching cannot be well delivered in congested classes and this coupled with inadequate supply of educational resources makes the teaching environment worse (Kafu, 2012). Besides, the curriculum lacks linkages with the job market. There is no way a trainee can be trained to be a teacher only without industrial dimension and yet he is expected to train students for the industry (Zhao & Lianwei, 2006). The teacher must first have touch with the industry before he/she can train others for the same. Work experience is often required for teachers in vocational education. For example Brazil, Denmark, Japan, and the UK put particular emphasis on this dimension in their teacher recruitment. In the aforementioned countries industrial work experience is the

major precondition for entering the vocational teaching field (Grollmann & Rauner, 2006). Even in Germany, which maintains the highest formal level in terms of academic requirements for entering the vocational teaching field, there is usually real-work experience prescribed through the University curricula (Grollmann & Rauner, 2006). The majority of student teachers in Germany hold an occupational qualification in their field; in case that they do not hold this they have to undergo an internship in an enterprise (Grollmann & Rauner, 2006).

Poor administration of examinations was cited as an acute challenge facing Automotive Technology curriculum in its quest of producing market relevant graduates. From Table 4.16, poor administration of examinations had a mean of 4.17 indicating that respondents felt that it contributes to a very great extent in perpetrating mediocrity in Automotive Technology training. Examination is a measuring tool from which assessment and evaluation is done. When examination administration and management is flouted, wrong assessment and evaluation is likely to occur (Mehrem & Lehmann, 1991). This leads to faulty nominal and criterion evaluation (Mehrem & Lehmann, 1991). This is why the respondents felt that the quality of the Automotive Technology graduates is highly affected by examination cheating and poor examination management and by extension faulty nominal and criterion referenced evaluation. One of the functions of examination is to motivate students to read and understand the subject matter (Mehrem & Lehmann, 1991). But since the students can be able to cheat in examinations, they do not read at all, instead, they prepare to cheat in examinations. This can clearly be seen from the increased cases of examination cheating in the University of Eldoret. Since the university graduates are a product of examination cheating and are the people expected to administer national examinations on behalf of Kenya National Examination Council (KNEC) they may facilitate the

students to cheat in examinations. This may be the reasons for increased cases of cheating in the KNEC examination and ill-prepared Automotive Technology graduates in the job market.

4.11 Areas of improvement in Automotive Technology curriculum

The questionnaire sought to find out if there were areas of the curriculum that need to be revised, removed or added to the curriculum to make it relevant to the job market. The emerging themes from the responses to this item were as follows:

i. Vehicle bodywork technology to be added to the curriculum as it is omitted completely from the Automotive Technology curriculum. This omission is contributing to poor technical knowhow because vehicle bodywork knowledge is required for one to fully meet the TTIs curriculum requirements.

ii. Auto Computer Aided Design (CAD) and other CAD programs to be included in the automotive technology curriculum. This is because a TTI teacher is required to teach the same at diploma level and higher national diploma level.

iii. Auto electrics units to be increased and the content to be revised so as to be in-line with the current market demands. The electrical and computing technology used in motor vehicle is the most dynamic part of the engine. Although the engine layout has remained the same over the years, the electrical and computing component of the engine has been changing frequently. There is need to align auto electrics content to the job market requirement.

iv. Include units on control system in the automotive technology curriculum. This is because the job market requires automotive technology teachers to teach the same but is lacking in UoE Automotive Technology curriculum.

v. Omit Pascal programming as it do not have any relevance at all to the job market. Modern vehicles are programed with higher level languages and not pascal.

vi. Practical lessons to be done because they are not carried out at all.

vii. The automotive workshop to be equipped with modern equipment that will act as a model industry for the learners. This will enable the learner to be well equipped with industry based skills.

viii. Introduce driving courses as the job market demands the UoE graduates to teach driving lessons in the TTIs.

ix. Engineering materials to be divided in to two semesters as the content is too broad to be covered in one semester. The respondents felt that they were given too much within a short period and thus felt that engineering materials should be offered in two semesters.

x. Improve on the teaching methods used in teaching Technical drawing. Respondents observed that technical drawing teachers taught a practical subject theoretically. They indicated that most of the times the lecturers attend classes without drawing instruments. This left the learners with a lot of difficulties in learning the trade. Thus it is recommended that the teachers teach technical drawing practically.

xi. Enhance the linkage of the department with the industry so as the industry will always be informing the subject content of the curriculum. For example in china Many specialized course teachers, especially those who teach specialized courses or practical courses in vocational senior schools, are experienced technicians from enterprises, especially in short term specialties. This ensures that they are constantly infiltrating new technology to the learning institutions (Zhao & Lianwei, 2006).

4.12 Obsolete units in automotive technology Education curriculum

The questionnaire item sought to find out the learning experiences or aspects of the Automotive Technology curriculum that have been least beneficial to the respondents in relation to job market requirements and relevance. The emerging learning experiences/aspects from the responses to this question were that Pascal programing is obsolete and should not be included in the curriculum as the modern vehicles are programed using high level languages. Besides, basic chemistry should not be taught as the respondents could not link its relevance and application to Automotive Technology.

Also, physics should not be taught as a standalone subject but should be embedded into the subjects that require physics as a prerequisite knowledge. This way it will create more time for new specialty subjects to be embedded in the curriculum. Entrepreneurship education was also seen as irrelevant as it did not constitute the respondents teaching subjects. This is because students take entrepreneurship courses but very few manage to engage in entrepreneurship. Also the university does not have a feed-back mechanism to show how many TVET graduates have entered self-employment upon completion of their training (Ferej, 2012). Ferej (2012) indicate

that few graduate have shown interest in joining the informal sector as employees or owners. This is not surprising as the training exposes the respondents to very little or no information regarding self-employment in the informal sector (Ferej, 2012). This can be seen clearly as students are routinely guided to take industrial attachment with formal sector organization only and yet they are expected to start businesses in the informal sector where they have little knowledge about. Perhaps this is why respondents are of the opinion that the entrepreneurship course is of least importance to them.

Conversely, the respondents felt that history and trends in technology education did not add any value in them. This is disturbing revelation as history in technology education is very important as it position the student in the current educational setup by painting to the student the original and the future expectation of technology education. The study recommends that more investigations need to be done to establish the root cause of student indicating that history and trends in technology education did not add value to them. Finally, student's final project was deemed not relevant by the respondents because the projects materials are not provided and thus no meaningful project is undertaken. From the study, the students value the importance of the projects but are frustrated due to lack of financing of the project by the university. This results in the student learning minimal skills during project implementation and thus finding it irrelevant.

4.13 Way forward in automotive technology Education

The questionnaire sought to find out the respondents recommendations on how to improve Automotive Technology curriculum. The emerging suggestions from the respondents to this question are as follows:

i. Technology Education Department to review Automotive Technology curriculum to be in line with the TTIs curriculum and automotive repair and assembly industry. This can be achieved by allowing TTIs and automotive industry to dictate the nature of the training. One way of doing this is through partnering with the TTIs and industry. This will in turn improve collaboration and shearing of knowledge between TTIs, industry and the university.

ii. Build and equip Automotive Technology workshop with modern facilities. This will enable the learners to acquire relevant practical skills.

iii. Increase the duration of industrial attachment period from two to three months and the industrial attachment session from one to two sessions. The first attachment should be done in second year. This way, it will allow the learners to acquaint themselves with the industry and know the expectation of the industry. The second attachment should be done in fourth year. This will allow the learner opportunity to practice what they have learnt in classroom. Also the second industrial attachment will present the learners with opportunity to be employed in the industry as they will have completed their University training.

iv. Introduce CAD programs in automotive curriculum. This will equip the learners with the required competence to handle CAD program courses in the job market. Also this will make the learners to be at per with industry knowledge requirements as most industries have replaced their drawing tables with computers.

v. Put emphasis on practical lesson. Practical's will enrich the learners with relevant psychomotor skills (Rono, 2015). More importantly this will build the soft skills of the learners including positive work attitudes towards blue color jobs and self-employment (Ferej, 2012). Practical's can be done more frequently by having live work. This will give the students the opportunity to interact with live work and customers. It will also make the course self-sustaining as it will be generating money that can be used to purchase more practical material.

vi. Introduce diagnosis of automotive problems using computer into the curriculum. When learners enter the automotive industry without this knowledge they become technical misfits. Long are the days when automotive technicians used bulb testers to diagnose automotive problems. Introduction of this body of knowledge to the curriculum will make automotive technology graduates compliant to the world of work requirements.

vii. Introduce the use of Information Communication Technology (ICT) in teaching. This will come with several advantages including enhancing understanding as ICT will enable teachers to use models and animations to explain process that would have been otherwise difficult to explain (Collins & Halversone, 2010). The use of models and animation will also cut the cost of instruction delivery as it does not consume materials which could have otherwise been very expensive (Collins & Halversone, 2010).

viii. Include field trips in the automotive technology curriculum. This will give the learners opportunity to interact with technologies that are too expensive for the university to acquire.

ix. “Lecturers teaching automotive technology subjects should be pushed to better their teaching methods and class attendance”.

x. The Automotive Technology course to be offered under the School of Engineering. This way the learners will graduate with Bachelor of Technology in Automotive Technology (with education). To actualize this one extra year need to be added to the course so as to take five years. This will allow the learners to cover both specialty and pedagogy subjects. This will be very advantageous to both the University and the learners as the University will be graduating market relevant graduates while the graduates will be registerable with both Engineering Board of Kenya (EBK) and Teachers Service Commission (TSC). This will open wide employment opportunities for the Automotive Technology graduates.

xi. Improve on the practical expertise of the Automotive Technology technician. This will be achieved by enrolling the automotive technicians to refresher courses and periodical industrial attachment. This way the technician will be in a position to handle the practical lessons better.

xii. Rename Automotive Technology subjects and degree titles to be in line with the job market. Rebranding the University of Eldoret Automotive Technology education is paramount in the quest of making Automotive Technology curriculum relevant to the job market. For the Automotive Technology curriculum to stay competitive and relevant to the job market re-brand the program to Bachelor of Automotive Technology (with education). The Automotive Technology subjects should also be re-branded to Automotive Technology instead of Power Mechanics Technology.

4.14 Additional comment that can improve automotive technology education as envisaged by the respondents.

An item in the questionnaire sought to find out any additional information that the respondents felt was important but had not been addressed by the questionnaire items. The respondents provided the following information.

i. The UoE Automotive Technology student should be exposed to practical skills through live work. This is where the learner under instructions of technician services and repairs vehicles that are in good serviceable condition. The Automotive Technology training should be modeled from the medical training model. This means that automotive technology training should be located in a busy garage. This will enable the learners to practice their trade from day one. Also this will assist the learners to learn soft skills including positive attitude towards automotive technology education and customer handling techniques.

ii. Lack of learning materials has not been addressed by Technology Education department. The Automotive Technology Department should show commitment in providing educational resources.

iii. The UoE to provide enough materials for the final year project. Automotive technology Department should provide the learners with the necessary materials to facilitate them to carry out final year project. This will give the learners opportunity to demonstrate their skills, creativity and theory knowledge already acquired from class.

iv. The UoE automotive curriculum should be revised so that practical to be examined through stand-alone sitting examinations. This will require the

learner to be evaluated in both practice and theory during the final examination. Implementing this proposal will motivate the UoE to equip the workshops and provide practical equipment's and materials.

4.15 Summary of the chapter

This chapter analyzed and presented the generated data in tables, graphs and texts. The chapter also provided the interpretation and discussion of the generated data. The data rated UoE Automotive Technology curriculum as being rich in imparting theoretical knowledge to the student but lacking capacity to impart practical skills to the students. Besides the curriculum lacked some key content areas and suffered acute shortage of educational materials. Also the workshops were ill-equipped to support teaching of practical skills. The respondents were of the opinion that UoE Automotive Technology curriculum should be revised and the program to be rebranded from bachelor of education to bachelor of technology in automotive with education.

CHAPTER FIVE

CONCLUSIONS, RECOMMENDATIONS AND SUMMARY OF THE STUDY

5.1 Introduction

This chapter highlights conclusions, recommendations and summary of the study. Conclusions were drawn from the generated data and the recommendations were further arrived at by relating the conclusions to the objective of the study. The conclusions and recommendations are presented according to the objectives. Also the chapter gives recommendations for further research, summary of the chapter and summary of the study. Recommendations for further research are based on the emerging gaps in the study that needs further investigation.

5.2 Conclusions

The study was designed to find out why Automotive Technology teachers entered the job market while ill-prepared and failed to meet job market requirements and expectations. This informed this study to address the problem of "half-baked" TVET teachers from the UoE curriculum angle. From the obtained results the question "Is the University of Eldoret Automotive Technology curriculum relevant to the job market?" is answered. The answer is that the UoE Automotive Technology curriculum is rich and relevant in theoretical content but poor and irrelevant in practical content. This is because the UoE curriculum has deficiencies in theoretical content, practical content, curriculum materials, curriculum evaluation and curriculum implementation. Specifically, from the obtained results, the curriculum is deficient because of:

1. The Automotive Technology Education curriculum lacks the purpose of the curriculum. This means that it lacks aims of the curriculum, philosophy of the

curriculum, objectives of the curriculum, mission of the curriculum and the role of the Technology Education in the society.

2. The majority of the subjects offered in UoE Automotive Technology curriculum are relevant in equipping trainees with sufficient theoretical knowledge desired by the job market however Pascal computer programming and advanced vehicle carburetor system were conceived by the respondent to be offering obsolete knowledge. Further, the respondents felt that entrepreneurship and chemistry are irrelevant in their training. The study establishes that Automotive Technology education completely lacked the practical domain besides subjects like Engineering materials and Auto electrics offered too much content to be covered in a semester. The study also established that control system, driving, computer aided design and vehicle body technology were completely omitted from the curriculum.

3. There is inadequacy in the provision of instructional materials which leads to training focusing more in theoretical content thus trainees lacking practical proficiency in their chosen fields of specialization. In addition the workshop being used was not designed according to the building code in Kenya. This makes the workshop unfit to be used to achieve the Automotive Technology education curriculum objectives.

4. Inappropriate teaching methods used for subjects that require the student to gain practical skills. Practical subjects are taught theoretically.

5. The evaluation criteria used to determine student performance is inadequate. The study established that the students were not examined on practical skills

acquired during the final examinations. In addition, whereas continuous assessment on practical skills contributed to twenty percent of the final mark, whenever a student failed the examination he was asked to retake the theory examination only. Also industrial assessment was done only once during the entire attachment period. Besides, the criterion for evaluating the general course performance in relation to the job market is completely missing.

6. The Automotive Technology curriculum implementation is faced with serious challenges including: lack of commitment from the curriculum implementers, large class sizes, cheating in examination, poor examination management, inadequate supply of educational resources and the importance of industrial attachment is relegated in priority. These challenges have contributed in the ill-preparation of Automotive Technology education graduates for the world of work.

5.3 Recommendations

In view of the findings of this study and subsequent conclusions, the following recommendations are drawn based on the study objectives.

1. The general purpose of the curriculum and the specific purpose of each subject to be included in the curriculum by the UoE Technology Education Department. This should include aims of the curriculum, philosophy of the curriculum, objectives of the curriculum, mission of the curriculum and the role of the technology education in the society. The generation of the purpose of the curriculum should be guided by the job market demands, national goals of education, national goals of technician training,

goals of automotive engineering training in TTIs, relevant professional bodies' regulations, experts' opinion, vision 2030 blue print and the societal needs.

2. It is recommended that the subjects in the Automotive Technology curriculum should be realigned so as to meet the Automotive Technical institutions and industry needs by UoE Technology Education Department. This will broaden the job prospects of its graduates. Also, an evaluation and revision of the syllabus is necessary to accommodate the additional courses and content required by the job market. Evaluation and revision of the curriculum will allow deleting the obsolete course contents and subjects. This shall be well achieved by revising the curriculum based on need analysis and training plans developed by recognized organization and experts. The review shall be done after every three years to reflect the technological changes experienced in the world of work.

3. The University of Eldoret Technology Education Department should build their training facilities and resources to be as close and similar to those found at the workplace. This Department should strive to make their workshops to be a model work place so that the trainees are exposed to variety of specialized tools and equipment. Relevant automotive technology text-books and training manuals should also be availed in sufficient quantity to the trainees. For the design and facilities of the workshop to be relevant to the job market, a needs assessment should be done. Appendix 2 provides a checklist designed to assist technology educators in completing the needs assessment component of the procedures of developing a technology education workshop. Subsequently, observation guide facility check list Appendix 3 shall be used to design and organize the workshops.

4. The Automotive Technology lecturers to be inducted on teaching methods to be used for preparing of the 21st century Automotive Technology students by specialist in teaching methodologies. Also Technology Education Department should facilitate the lecturers with appropriate educational media for them to teach the student using experimental and practical method. Besides, it is further recommended that training using simulators, available through modern technology like computers, be explored by lecturers to complement current training method, as a way of reducing cost of consumable materials.

5. The curriculum and students evaluation criteria should be revised by Technology Education Department to suit the job market demands. Since Technology is changing at a very high rate, the study recommends that the curriculum be revised after every three years. This will make the curriculum to remain relevant to the market needs. This shall be made possible by:

i. Technology Education Department through University Senate should introduce practical examinations which should be done and marked out of hundred percent. It should also be examined as a stand-alone unit. This will motivate the university to equip workshops, learners to read and lecturers to teach practical to their students. It will also enable examiners to point out the trainee's area of weakness with much certainty. That is whether the trainee is weak in theory content or practical content.

ii. Technology Education Department through University Senate should increase industrial attachment period to six months. The six months attachment period should be done in two phases of three months each. The first phase should be done in second year so that the student can acquaint him/herself with the job

market and the second phase should be done in fourth year so that the student can practice what he/she has learnt in class. Assessment of industrial attachment should be done through mentorship just like in internship and pupilage. The trainees should be attached to qualified professionals in the industry to guide and evaluate their progress on daily basis. Technology Education Department should identify these master craftsmen and women from industries and train them on how to mentor and evaluate students on attachment.

iii. The number of projects done by the students should be increased to one each academic year by Technology Education Department. This will assist in equipping the students with hands on and innovative skills. The first projects should be designed to duplicating already existing projects while the latter projects should be designed to in co-operating elements of modification and innovation. The projects should be relevant to solving problems found in the market.

iv. The use of take away assignments as an evaluation tool should be stopped by lecturers as it has proved to add no value to the students. Take away assignments are supposed to give the student an opportunity to read and research further about a topic for deeper understanding and then return the feedback to the lecturer for guidance. But since the inception of the internet in the 2000s, it has made it difficult for any meaningful assessment to be done through take away assignments. This is because the students will simply download the material from the internet and even without editing present the assignment to the lecturer for evaluation. Thus the study recommends that

teachers should use more sit-in assessments as opposed to take away assessments. This is because in sit-in assessment the teacher will be able to control the use of internet. This way the true ability of the trainees can be measured.

v. The University of Eldoret should out-source examination services complete with examination invigilators. The examination body shall be charged with setting, moderation, administration and management of the examination. This will reduce examination leakages and cheating in examination. It will also ensure that the examination meets the required standards. Besides, this will force the lecturers to clear the syllabus and not teach for examination purposes as they have little or no control over examinations setting.

6. Technology Education Department should move with speed to address challenges facing Automotive Technology curriculum. This should be done by:

i. Reducing the student in-take to match the available resources. Although the government desire is that more youth should be trained in technical and vocational education for Kenya to be industrialized by the year 2030, the reality is that the educational resources in the University of Eldoret are strained. For skillful human capital development to be achieved the students admissions in UoE should match the available educational resources.

ii. Automotive Technology section should establish links with the world of work and other technology professional bodies. The Automotive Technology education competency attained by the students should be recognized by both TSC and technology professional bodies. An Automotive Technology

industrial liaison office should be established dedicated in maintaining links with the market and giving feedback to the UoE about the markets demands.

iii. Technology Education Department should advise Kenya Universities and Colleges Central Placement Services (KUCCPS) to admit students interested in Automotive Technology only. Further, Technology Education Department should allow the students the liberty to choose their specialty as they proceed to second year. Besides, Technology Education Department should make it mandatory that a student ought to have done automotive as a subject in high school and scored a minimum of C+ for one to qualify for Automotive Technology Education at UoE. If this is not the case the candidate should poses a Diploma certificate in automotive engineering. If the candidate scored a pass he/she begins in first year, if the candidate scored a credit or distinction he/she joins second year and if the candidate has a Higher National Diploma he/she joins in third year.

iv. Technology Education Department should rename the subjects and the program to be in line with the job market. Rebranding the University of Eldoret Automotive Technology education is paramount in the quest of making Automotive Technology curriculum relevant to the job market. For Automotive Technology curriculum to stay competitive and relevant to the job market, the program should be re-branded to Bachelor of Automotive Technology (with Education). The Automotive Technology subjects should also be re-branded from Power Mechanics Technology to Automotive Technology. If possible the subject name should reflect the content. For

example: Engine Technology I, II, Diesel Mechanics, Vehicle body technology, Vehicle Technology.

v. The School of Education through the University of Eldoret senate to add one extra year to the course so as the programme to take five years. This will allow the learners to cover pedagogy subjects and all specialty subjects required by both TSC and technology professional bodies. This will be very advantageous to both the university and the learners as the university will be graduating market relevant graduates while the graduates will be registerable with both Teachers Service Commission (TSC) and technology bodies. This will open broader employment opportunities for the Automotive Technology graduates and also make them compliant with the TVETA act (2012) requirements.

vi. The University of Eldoret should improve its investment in Technology Education Department as justified by the human capital theory. This will enable the department to purchase enough educational resources to support human capital development. In turn the department will produce relevant human capital necessary for industrialization by the year 2030.

vii. The Head of Technology Education Department to monitor the lecturer's class attendance by the use of class attendance sheet to be maintained by the student's class representative and handed in his office every Monday morning for analysis. This will allow the Head of Department to respond on problems on lecturer's attendance to lessons promptly. This will in turn improve the quality of Automotive Technology education as teachers will be able to clear the syllabus on time. This will also help curb the tendency of lecturers

teaching for examination purpose instead they will teach for knowledge purpose.

5.4 Suggestions for Further Research

With the rapid changes in the world of work backed with the findings of this study, it is suggested that the following studies be done:

i. A study to find out the challenges faced by Kenyan TVET graduate venturing in to entrepreneurship.
ii. A study to find out the efficiency of school-based programmes in teaching practical programs.
iii. Andragogy or pedagogy: Which way to go in Technical Education.
iv. A study to establish the number of TVET graduates venturing into self-employment after college.

5.5 Summary of the chapter

The chapter concluded that UoE Automotive Technology education is good in teaching theoretical content but poor in imparting practical skills. Further, the study concluded that the purpose for the Automotive Technology curriculum was not stated besides the curriculum missed key content areas. It is on these grounds that the study recommended that UoE Automotive Technology curriculum should be revised. The revision should target, introduction of practical examination, increasing industrial attachment period, rebranding of the program and inclusion of the missing content areas.

5.6 summary of the study

This study sought to establish the relevance of UoE Automotive Technology curriculum to the job market requirement. The study comprised of five chapters, namely: Introduction of the study, Literature Review, Research Design and Methodology, Data Presentation, Analysis, and Interpretation, Discussion and Conclusions and Recommendations and Summary of the study. Introduction of the study presented the background of the study which led to objectives, significance and justification for the current study. The literature review positioned the study to what other empirical research had established and thus provided the knowledge gap to be filled. Research methods and methodology provided the study with justification for using explorative case study to address the established knowledge gap. It further justified the use of observation, questionnaire and document analysis to generate data for addressing the knowledge gap. The data was analyzed with the help of SPSS, presented in tables, graphs and texts and later interpreted and discussed. After which conclusions and recommendations were drawn based on the generated data and the research objectives.

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APPENDICES

APPENDIX I: TECHNICAL TEACHERS QUESTIONNAIRE

Questionnaire for Moi University Power Mechanics Technology (PMT) Graduates Teaching in Technical and Polytechnics Institutions

Dear TED Alumni,

Hallo alumni, this study is being carried out to investigate how relevant Moi University Technology Education Power Mechanics Technology Curriculum is to the job market. Please answer the questions freely. Even if you feel the items covered may not apply directly to your working life please do not ignore them. Your answers are essential in building an accurate picture of the issues that are important in order to provide recommendation to improve Technology Education Power Mechanics Curriculum. Also, the study is being conducted in partial fulfillment of the requirements for the award of Doctor of Philosophy degree in Curriculum studies at the University of Eldoret.

All The Information You Provide Will Be Treated In The Strictest Confidence.

Please try to complete the questions individually and do not guess the answers. Your first thought is usually your best! Write or tick (✓) where appropriate.

When You Have Completed The Questionnaire Please Hand It To The Research Assistant.

Thank you for taking the time to help improve Automotive Technology Curriculum. Your input in terms of providing information as required in this questionnaire is HIGHLY APPRECIATED and very valuable to the study.

Thank you for your help.

Paul Machocho
PhD Candidate and Power Mechanics Technology Lecturer
University of Eldoret

SECTION A: Demographic information

1. Which year did you graduate from the Automotive Technology Program at Moi University?

_____

2. Please indicate your
gender._____

SECTION B: To what extent is the course purpose of power mechanics technology relevant to job market requirement?

3. To what extent did the Automotive Technology curriculum help you develop the following critical and creative thinking skills?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Ability to gather evidence by asking in depth questions					
Ability to use data to make informed judgments about a technical problem					
Ability to identify problems using technology					
Ability to solve problems using technology					
Ability to evaluate technical problem solution alternatives using technology					
Ability to take intellectual risks while solving new technical problems					
Ability to integrate existing technical knowledge across disciplinary boundaries					
Ability to evaluate the limits of my own technical knowledge					
Ability to contribute to the improvement of society by using technology					
Ability to cope up with the changing technology by self-learning.					
Ability to control technology by operating different automotive repair machines					

4. To what extent did the Automotive Technology curriculum help you develop the following teaching literacy?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Ability to identify information effectively from a variety of sources and formats					
Ability to critically evaluate information effectively from a variety of sources and formats					
Ability to use information effectively from a variety of sources and formats					
Ability to communicate numerical data					
Ability to select appropriate technology to enhance the communication of knowledge					
Ability to use appropriate technology to enhance the communication of knowledge					
Ability to create visual media for teaching.					
Ability to communicate complex engineering design blue prints(TD)					
Ability to communicate key information from complex texts and effectively to students					
Ability to use different teaching methods effectively					
Ability to team work in a collaborative manner with team members to complete tasks					
Ability to demonstrate ethical reasoning of mind in decision making including academic integrity					

5. To what extent did the Automotive Technology curriculum help you develop the following learning outcomes?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Diagnosing an automotive engine for problems					
Preparing parts list for design purpose					
Welding using arc welding					
Welding using gas welding					

Repairing an automotive engine					
Developing good command of automotive theoretical knowledge					
Developing engineering drawings skills using computer software's					
Selecting engineering materials for engineering design					
Becoming an effective teacher					

6. Complete this statement. What I learned in Automotive Technology curriculum was relevant to my?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Teaching theoretical lessons					
Teaching practical lessons					
Self-employment (running an automotive garage)					
Academic Development (Lifelong learning- become continually educated)					
Community Development					

SECTION C: To what extent are the subjects offered in power mechanics technology relevant to job market requirements?

7. What I learned in the Automotive Technology curriculum prepared me to **teach theory lessons** in the following disciplines in technical institutions.

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Engine technology					
Vehicle technology					
Technical drawing and design					
Technical drawing and sketching					
Thermodynamics					

Vehicle body works					
Strength of materials					
Fluid mechanics					
Kinetics and kinematics					
Engineering mathematics					
Engineering materials					
Workshop organization and management					

8. What I learned in the Automotive Technology curriculum prepared me to **teach practical lessons** in the following disciplines in technical institutions.

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Engine technology					
Vehicle technology					
Technical drawing and design					
Technical drawing and sketching					
Thermodynamics					
Vehicle body works					
Strength of materials					
Fluid mechanics					
Kinetics and kinematics					
Engineering mathematics					
Engineering materials					
Workshop organization and management					

9. The Automotive Technology curriculum courses has the following strength that makes it relevant to the job market?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
The curriculum content accurately captures the types of duties a graduate can expect to perform in the technical institute work environment					
The curriculum content accurately captures the types of duties a graduate can expect to perform in the automotive repair/manufacture industry work environment					
The curriculum length is sufficient to produce graduates with the required entry level knowledge to the world of work					
The Automotive Technology curriculum subjects are relevant to the job market requirement					
Does the sequencing of training (i.e. order of courses) within the curriculum properly address course pre-requisites?					
Do you feel that there is a proper balance between theory and practice during training					
The length of industrial attachment is sufficient to further build on the students' skill level already developed in class?					

10. Are there areas of the curriculum (i.e. specific courses or learning objectives) that need to be revised, removed or added to the program to make it relevant to the job market? Please specify, providing a rationale where necessary.

_____
_____
_____
_____
_____
_____
_____

SECTION D: How relevant are the Automotive Technology curriculum materials to the job market requirement?

11. To what extend do you agree with the following statements:

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
The curriculum current admission requirements will ensure that students will have the basic knowledge required.					
The tools, equipment and supplies listed for practical components of the **curriculum** are satisfactory for curriculum delivery.					
The curriculum textbooks are relevant for Automotive Technology curriculum delivery					
There is adequate learning resources (i.e. print media, audio-visual materials, etc.) provided for curriculum delivery.					
The instruction is reinforced with appropriate technologies (i.e. OBD kit, CAD software's, equipment, etc.) to prepare a technologically relevant teacher.					

SECTION E: To what extent do the teaching methods and quality of teaching affect the relevance of Automotive Technology program to job market requirement?

12. Reflecting back on your studies, please indicate the extent to which the following experiences contributed to making you more relevant to the job market

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Sitting CATs					
Take away assignment					
Workshop practice					
Industrial attachment					
Supplementary exams					
Final Exams					
Final year project					
Academic Field trips					
Teacher centered teaching(lecture method)					
Learner centered methods					

Group discussion					
Own reading and learning					
Library textbooks					
Internet					

13. What is your feeling about the following statements?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Do you feel that available curriculum instructional materials for Automotive Technology model appropriate work habits for the TTI job market?					
Do you feel that available curriculum instructional materials for Automotive Technology model appropriate work habits for the automotive repair industry job market?					
Do you feel that the Automotive Technology curriculum content/learning activities are consistent with technical institute's job market practices?					
Do you feel that the Automotive Technology curriculum content/learning activities are consistent with automotive repair industry job market practices?					

SECTION F: To what extent is the curriculum evaluation mechanism effective to ensuring relevance of Automotive Technology to the job market?

14. To what extend do you agree with the following statements:

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	2	3	4	5
Supplementary exam evaluation used for Automotive Technology curriculum is appropriate to the job market					
Take away assignment evaluation used for this curriculum is appropriate to the job market					
Sitting exams evaluation used for Automotive Technology					

curriculum are appropriate to the job market					
There is an adequate balance between theoretical and practical assessments in Automotive Technology program					
The industrial attachment requirements for successful completion of the curriculum is sufficient.					
The final project requirements for successful completion of the curriculum is sufficient.					
The passing grade requirements for successful completion of the curriculum are sufficient.					
The graduate of this curriculum should be registered by the engineering regulation board					

15. Please list the type(s) of occupational position(s) for which graduates would have wished to be considered for employment as a result of successful completion of this curriculum (i.e.: Engineer, Systems Analyst, Administrator, etc.)

_____
_____
_____
_____
_____
_____
_____

16. Overall, is Automotive Technology curriculum relevant to the job market?

	Extremely relevant	Moderately relevant	Slightly relevant	Slightly irrelevant	Moderately irrelevant	Extremely irrelevant
Core subjects						
Educational subjects						

17. What learning experiences or aspects of the Automotive Technology curriculum have been least beneficial to you in relation to job market requirements and relevance? E.g Fluid mechanics, Basic chemistry, etc

_____
_____
_____
_____
_____
_____
_____
_____

18. If you were going to improve the Automotive Technology curriculum, what would be your top three recommendations?

_____
_____
_____
_____
_____
_____
_____

SECTION G: What are the challenges facing effective preparation of relevant Automotive Technology graduates for the world of work?

19. To what extent do the following curriculum challenges affect effective preparation of relevant Automotive Technology graduates for the world of work?

(1 = not at all, 2 = to a little extent, 3 = I don't know, 4 = to a great extent, 5 = to a very great extent,)

	1	**2**	**3**	**4**	**5**
Low student motivation					
Entrance behavior					
Too much stress on examination					
Curriculum goals not stated clearly					
In adequacy in the syllabus					
Too much noon teaching duties on the subject lecturers					
Absenteeism of lecturers					

Absenteeism of students					
Lack of enough curriculum teaching materials					
Irrelevant curriculum materials					
Incompetent lecturers					
Large class sizes during lecturers					
Weak linkages with job market					
Poor teaching methodologies					
Poor administration of examination (cheating in exams)					

SECTION H: Additional Comments

20. Please provide any additional comments regarding the Automotive Technology curriculum that you feel have not been addressed to make it more relevant.

_____
_____
_____
_____
_____

THANK YOU VERY MUCH FOR YOUR CONTRIBUTION

APPENDIX II: Needs assessment checklist

This checklist is designed to assist technology educators in completing the needs assessment component of the procedure to develop a technology education workshop. The checklist is comprised of five sections. The first section concerns administrative information; the second section concerns identification of instructional requirements; the third section guides the selection and acquisition of equipment and the determination of the equipment specifications; the forth section aids in the determination of structural requirements and identification of utility requirements; and the fifth section guides the identification and selection of laboratory and classroom furniture. A separate report should be prepared for each question.

Administrative information

1. What is the allocated budget?
2. Who is responsible for project completion?
3. Who is responsible for laboratory safety?
4. Who can authorize changes in design or engineering aspects?
5. Describe any specific requirements that may affect design or construction?
6. What safety requirements must be adhered to?
7. What are the security requirements?

Instructional requirements

1. What courses will be taught in the laboratory?
2. What are the audio-visual requirements?
3. How many students will be enrolled for the course?
4. How many section of the same course will be taught simultaneously?
5. How many teachers will be involved for the program?

6. Which delivery system will be used?
7. Which approaches to teaching technology education will be used?
8. What types of instructional materials are required for laboratory instruction?
9. How much time is allocated for each section?
10. What will be the duration for each completed course?
11. What extramural activity related to coursework will the students engage in?
12. What percentage of each course is taught in the classroom?
13. What percentage of each course is taught in the workshop?
14. What are the specific goals for each course?
15. What are the specific purposes for each course?
16. What are the safety hazards associated with instruction?
17. What are the anticipated future curriculum needs?

Identification of equipment needs and equipment specifications

1. What laboratory equipment is required for teaching each of the courses identified in section one?
2. What instructional equipment is required for teaching each of the courses identified in section one?
3. Which pieces of equipment can be used to teach more than one course?
4. How many pieces of each type of equipment are required to teach each course?
5. How many students will be able to use each piece of equipment during each class period?
6. What are the laboratory equipment specifications?

7. What are the instructional equipment specifications?
8. How will equipment be acquired?
9. What are the specific safety hazards associated with each piece of equipment?

Identification of structural requirements and utility requirements

1. How many laboratories will be required?
2. What types of laboratory are required?
3. What are the access requirements?
4. Which utilities are required for each of the pieces of equipment identified in section two?
5. What are the heating loads?
6. What are the cooling loads?
7. What are the electrical requirements?
8. What ventilation requirements are needed?
9. The walls should be composed of what materials?
10. The floors should be composed of what materials?
11. From what materials should the ceiling be made?
12. From what materials should the utility lines be made?
13. What specialized rooms are required?
14. What are the coordination requirements among rooms, activities, and classes?
15. What are the specific requirements affecting placement of utilities?
16. What utilities already exist in the facility if this is a remodeling project?
17. What aesthetic requirements must be considered?
18. What are the storage requirements?
19. What are the administrative requirements?
20. What are the maintenance requirements?

21. What are the structural support requirements for utilization of each equipment?
22. What are the potential noise problem that might be considered?
23. How much space is required for each classroom?
24. How much space is required for each piece of equipment?
25. How much space is required for each laboratory?
26. What is the desired classroom floor plan arrangement?
27. What is the desired laboratory floor plan arrangement?

Identification and selection of laboratory and classroom furniture

1. What laboratory furniture is required?
2. What classroom furniture is required?
3. From what materials should the above identified furniture be constructed
4. What are the placement specifications?

APPENDIX III: Observation Guide Facility checklist

This list is intended to be a guide for an evaluator who is knowledgeable about automotive educational facilities; therefore, it is not inclusive of all factors affecting all laboratories. **A General location**

1. Location in relation to the main building
2. Location in relation to other laboratories
3. Delivery access
    a. Location
    b. Size
    c. Driveway

B Laboratory space

1. Shape of the workshop
2. Total floor area
3. Area per student squire feet
4. Ceiling height
5. Aisles

C Surface treatment

1. Floors
    a. appropriate material for each area
    b. Conditioning
    c. Color
2. Walls and partitions
    a. Appropriate material for each area
    b. Conditioning

c. Color

d. Acoustical material

3. Ceiling

a. Appropriate material for each area

b. Conditioning

c. Color

d. Acoustical material

D Doors

1. Students access/exit

a. Location

b. Size

2. Service access/exit

a. Location

b. Size

3. Emergency access/exit

a. Location

b. Size

E Windows

1. Location
2. Area
3. Size
4. Area above the floor
5. Control of natural light
6. Number per unit area

F Heating and cooling

1. Size
2. Operation noise level
3. Control
4. Relative humidity

G Ventilation

1. Adequate
2. Control

H Dust control/vacuum system

1. Air purification system
2. Specific machines and equipment

I Illumination

1. General lighting
    a. Artificial
        1) Adequate
        2) Control
    b. Natural
        1) Adequate
        2) Control
2. Task lighting
    a. Artificial
        1) Adequate
        2) Control
    b. Natural

1) Adequate

2) Control

J Electrical servicing

1. General availability
    a. Voltage
    b. Amperage
    c. Phases
2. Convenience outlet
    a. Adequate number
    b. Location
    c. Flexibility
    d. Surge protection
    e. Height from the ground
3. Machine connection
    a. Ease to connect/disconnect
    b. Ease of relocation
    c. Flexibility
    d. Distance from the operation bay
4. Master control with multiple shut-off locations
5. Overload protection

K Other utilities

1. Natural gas
    a. Experiment benches
    b. Demonstration bench

c. Specific equipment

2. Compressed air

3. Water

a. Personal washing

b. Drinking fountains

c. Utility sink

4. Telephone

a. Jacks

b. Modem

c. Charging areas

L Major Area considerations

1. Instruction

a. Location

b. Size

c. Seating

d. Educational media capabilities

2. Instructors area/office

a. Size

b. Location

c. Privacy

3. Storage

a. Teaching materials

b. Students classroom materials

c. Students work e.g. projects

d. Laboratory materials and supplies

1) Active storage small quantities
2) Inactive storage large quantities

e. Portable tools and equipment

4. Finishing area/room
   a. Size
   b. Lighting
   c. Ventilation
5. Display areas
   a. Centrality
   b. Location
6. Project/production assembly area
7. Laboratory library/resource area
   a. Reference materials
   b. Computers with internet
   c. Workshop manuals
   d. Instructional materials

M Visual supervision

1. Ability to see all areas from any position in the workshop

N Equipment/machines

1. Adequate to facilitate instruction
2. Appropriate for anticipated use
3. Meets physical needs of all students
4. Condition of maintenance
5. Logical placement

6. Safe operator area
7. Flexibility

O Hand tools

1. Appropriate
2. Quantity
3. Quality
4. Storage facility and its location in relation to the working area
5. Safety
6. Security
7. Flexibility

P Work station

1. Sufficient in number
2. Appropriate for each activity
3. Location
4. Condition

Q Traffic analysis

1. Aisle width
2. Projection into aisles
3. Spacing between machines
4. Equipment placement for sequential use
5. Corridor area/ width and location
6. Laboratory to laboratory distance

R Safety

1. Machine guards

2. Safety color coded equipment parts
3. Safety zones identified
4. Fire detectors
5. Fire extinguishers
6. Fire alarm system
7. Fire prof storage
8. Automatic sprinkler system
9. Safety glasses
10. First aid kit
11. Waste storage
12. Consideration for students with special needs

S Evidence of proper maintenance

T Restroom facilities

APPENDIX IV: Research Permit

THIS IS TO CERTIFY THAT:
MR. PAUL MACHOCHO WANYEKI
of UNIVERSITY OF ELDORET, 657-50200
bungoma,has been permitted to
conduct research in *Bungoma , Busia , Kakamega , Kisii , Nandi , Nyamira , Siaya , Uasin-Gishu , Vihiga Counties*

on the topic: *AUTOMOTIVE TECHNOLOGY TEACHER TRAINING CURRICULUM IN UNIVERSITY OF ELDORET, KENYA: RELEVANCE TO JOB MARKET*

for the period ending:
18th September,2016

.....
Applicant's Signature

Permit No : NACOSTI/P/15/5997/7675
Date Of Issue : 22nd September,2015
Fee Recieved :Ksh 2,000

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 6659

CONDITIONS: see back page

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:

22nd September, 2015

NACOSTI/P/15/5997/7675

Paul Machocho Wanyeki
University of Eldoret
P.O. Box 1125-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Automotive Technology Teacher Training Curriculum in University of Eldoret, Kenya: Relevance to job market"*** I am pleased to inform you that you have been authorized to undertake research in **selected Counties** for a period ending **18th September, 2016.**

You are advised to report to **the Vice Chancellor, University of Eldoret, the County Commissioners and the County Directors of Education of the selected Counties** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

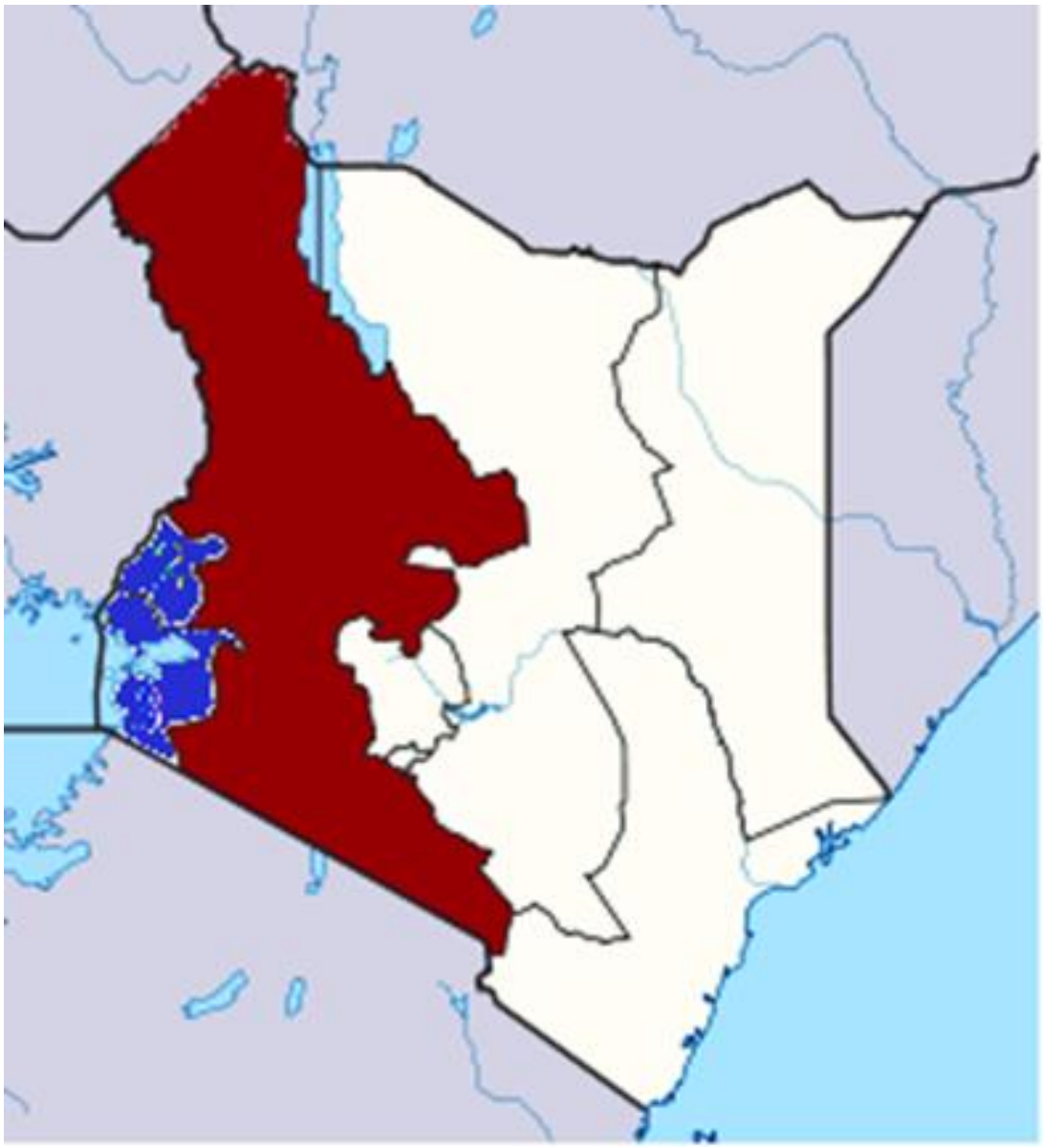
SHussein
SAID HUSSEIN
FOR: DIRECTOR GENERAL/CEO

Copy to:

The Vice Chancellor
University Of Eldoret.

The County Commissioners
Selected Counties.

APPENDIX V: Study Area Map



Key: The study site

North rift KATTI region

Western KATTI region