THE ROLE OF VOCATIONAL EDUCATION AND TRAINING IN PROMOTING TECHNOLOGICAL INNOVATION AMONG SMALL SCALE ENTERPRISES IN TANZANIA

The Case of Metal Working Enterprises in Dar es Salaam

Heric Thomas

MA (Development Studies) Dissertation
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The Case of Metal Working Enterprises in Dar es Salaam

By

Heric Thomas

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree of Masters of Development Studies of the University of Dar es Salaam

University of Dar es Salaam
September, 2011

CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the University of Dar es Salaam a dissertation entitled: "***The Role of Vocational Education and Training in Promoting Technological Innovation among Small Scale Enterprises in Tanzania: The Case of Metal Working Enterprises in Dar es Salaam,"*** in partial fulfilment of the requirements for the degree of Master of Arts (Development Studies) of the University of Dar es Salaam.

……

Dr. Adalgot A. Komba

(Supervisor)

Date……

DECLARATION

AND

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I, **Heric Thomas** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any University for similar or other degree award.

Signature……

AKNOWLEGDEMENT

I thank the Almighty God who loves me and enabled me to see this wonderful joyous occasion of completing my MA programme, both course work and the dissertation. May His name be glorified for ever and ever.

My sincere gratitude should go to different people who in one way or another helped me to produce this dissertation. I would like to give special thanks to my supervisor Dr. Adalgot Komba, for his supportive and constructive guidance throughout the period I was writing this dissertation. His advice, commitments and encouragement finally made this dissertation successful.

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Finally, I bear the responsibility for any shortcoming arising from this work.

DEDICATION

I dedicate this work to my late mother Bernarda Kavishe who passed away in 2002. Her foundation to my education has made me reach this level of education.

ABSTRACT

This study investigated the role of vocational education and training in promoting technological innovation among small scale enterprises in Tanzania, specifically metal working enterprises. The study was carried out in Dar es Salaam, in Kinondoni District. Literature on innovation and the role of vocational training on innovation were extensively reviewed. To measure innovation, three groups of entrepreneurs were used for comparison, namely; those trained by VETA, those with apprenticeship and VETA and Non-VETA. However, those with apprenticeship and VETA were used as a control group. To achieve the desired results, questionnaire, interviews and field observation were used for data collection. The statistical Package for Social Sciences (SPSS) was used for data analysis.

Study findings revealed that the role of vocational training in promoting technological innovation among small scale enterprises in Dar es Salaam was low. In order to respond positively to the situation, the study recommends that regular training of teaching staffs in order to acquire new and changing technology is required; periodic modernization of workshops/training facilities and replacing older training equipment and tools with new ones, policy strategies that focus on increasing time for the field training are required. Policy strategies that help entrepreneurs to open up new markets are required. Additionally, financial support in promoting innovation among small scale enterprises in the country is needed.

TABLE OF CONTENTS

Certification i

Declaration and Copyright ii

Dedication iv

Abstract v

Table of Contents vi

List of Tables x

List of Figures xi

List of Plates xii

List of Abrreviations xiii

CHAPTER ONE: INTRODUCTION 1

1.1 Introduction 1

1.2 Background to the Problem 1

1.3 Statement of the Problem 3

1.4 Objectives of the Study 4

1.4.1 Main Objective 4

1.4.2 Specific Objectives 4

1.5 Research Questions 4

1.6 Significance of the Study 5

1.7 Conceptual Framework 5

1.8 Limitations of the Study 7

CHAPTER TWO: LITERATURE REVIEW 8

2.1 Introduction 8

2.2 Innovation 8

2.3 Types of Innovation 11

2.3.1 Product innovation 11

2.3.2 Process innovation 11

2.3.3 Market innovation 11

2.4 Technological Learning 12

2.5 Technological Capability 12

2.6 Vocational Training in Technological Capability Building 14

2.7 Small Scale Enterprises and its Contribution to Economic Growth 16

2.8 Literature Gap 17

CHAPTER THREE:RESEARCH METHODOLOGY 18

3.1 Introduction 18

3.2 Study Area 18

3.3 Research Approach 19

3.4 Population 19

3.4.1 Sample Size 19

3.4.2 Sampling Techniques 20

3.5 Data Collection Methods 20

3.5.1 Questionnaire 20

3.5.2 Interviews 21

3.5.3 Field observations 21

3.6 Validity and Reliability of Data 21

3.7 Data Analysis 22

CHAPTER FOUR:DATA PRESENTATION, ANALYISIS AND DISCUSSION .. 23

4.1 Introduction 23

4.2 Basic Information about Respondents 23

4.3 Characteristics of the Enterprises 25

4.4 Extent of innovation among Enterpreneurs 28

4.4.1 New Product Innovation 29

4.4.2 Adoptive Product Innovation 29

4.4.3 Incremental Product Innovation (Modified Products) 32

4.4.4 Adoptive Process Innovation 34

4.4.5 Incremental Process Innovation 37

4.5 Marketing Strategies among Enterpreneurs 46

4.5.1 VETA Entrepreneurs 47

4.5.2 Apprenticeship and VETA Entrepreneurs 47

4.5.3 Non-VETA Enterpreneurs 48

4.5.4 Constraints to Innovation among Entrepreneurs 51

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS.55
5.1 Introduction……55

5.2 Summary 55

5.3 Overall Conclusion 56

5.4 Recommendations.....57

5.5 Areas for Further Research 59

REFERENCES.....60

APPENDICES 65

LIST OF TABLES

Table1: Entrepreneurs Level of Education ……..24

Table 2: Entrepreneurs Working Experience …….24

Table 3: Age of the Enterprises……...25

Table 4: Enterprises Ownership……..……26

Table 5: Number of Workers in Enterprise…..……27

Table 6: Type of Products Produced by Enterprises……...27

Table 7: Entrepreneurs with Adoptive Product Innovation……30

Table 8: Number of Entrepreneurs with Incremental Product Innovation …….33

Table 9: Number of Entrepreneurs with Adoptive Process Innovation……. 34

Table10: Entrepreneurs with Incremental Process Innovation ……...37

Table11: Entrepreneurs Marketing Strategies…….……47

Table 12: Constraints to Innovation among Entrepreneurs…….51

LIST OF FIGURE

Figure1. Conceptual Framework for Technological Learning……...6

LIST OF PLATES

Plate 1: Adopted bicycle for disabled people…….....31

Plate 2: Adopted motor vehicle…….... 32

Plate 3: Adopted grain milling machine…….35

Plate 4: Block mixer machine…….…..36

Plate 5: Modified vibrated block making machine……...38

Plate 6: Modified Hydraulic block making machine……....39

LIST OF ABRREVIATIONS

BRELA	Business Registration and Licensing Agency
CBA	Competence Based Assessment
CBET	Competence Based Education and Training
GDP	Gross Domestic Product
HP	Horse Power
ILO	International Labour Organization
NVTCs	National Vocational and Training Centres
NVTD	National Vocational Training Division
SIDO	Small Industrial Development Organization
SPSS	Statistical Package for Social Sciences
SMEs	Small and Medium Enterprises
SSEs	Small Scale Enterprises
STI	Science Technology and Innovation
VETA	Vocational Educational and Training Authority
VTC	Vocational Training Centres
UK	United Kingdom
URT	United Republic of Tanzania
UN	United Nation
WB	World Bank

CHAPTER ONE
INTRODUCTION

1.1 Introduction

This chapter presents the background to the study, statement of the problem, and objectives of the study. It also presents the questions which guided the study, significance and conceptual frame work.

1.2 Background to the Problem

Small Scale Enterprises (SSEs) are important forces for economic development. SSEs are common in most developing countries, including Tanzania, where they dominate both the urban and rural areas. However, most of these SSEs are located in big cities and towns (Bagwacha, 1990). The SSEs produce affordable goods and services, create employment to many people and thus contribute significantly to country's development and economic growth (Chao, 1988). Wangwe and Semboja (1997) noted that, in Tanzania, SSEs contribute more than 30 percent of the Gross Domestic Product (GDP). It is also important to point out here that SSEs act as an essential medium for efficient utilization of both skills as well as resources available within local community (URT, 2002).

It is argued that, although SSEs is potential in improving economic growth, the main problem facing the SSEs sector is lack of adequate skills and knowledge (Matambalya, 2002). Accordingly, the sector needs skilled working staffs and managers. Tanzania has been addressing the problem of shortage of skills in SSEs but success has not been

achieved as expected. For example, in 1973, Small Industrial Development Organization (SIDO) was established to engage its staffs in training and consultancy in SSEs (Mwangombola, 2005). With these efforts, a report by ILO (1984) points out that Tanzania's SSEs did not increase productivity but rather discouraged innovation in the industrial sector.

The World Bank points out that the fundamental solution for the manpower problem facing Tanzania's SSEs was the establishment of vocational schools and training centres since they are important for formation of industrial manpower (World Bank, 1991). It is therefore advanced that effective use of the vocational skills acquired from vocational education and training could serve as a basis for technological innovation within the SSEs in Tanzania (Ishumi, 1998).

Indeed, the importance of vocational training as a tool for SSEs growth has been recognized worldwide. Historically, it supported the industrial revolution by producing required artisans and is recognized as among the key factors that have contributed to the unique and rapid industrialization of South Korea and Singapore (known to have the world's most productive forces) fostering higher productivity and scaling down the level of unemployment (Mahigig, 2001).

Scholars have also argued that this kind of training contributes significantly to growth of SSEs. For example, Mshoro (2010) has noted that vocational training adds skills to owners of small scale enterprises change their behaviour on how they can conduct business activities and in turn enhance their ability to perform better. Through vocational

training, entrepreneurs can acquire networks, transfer technology, and develop commercial entities and better management techniques. This is because vocational training is mainly geared towards building entrepreneurial skills of trainees in order to better their business practices (Moshi, 2010).

Given the positive role vocational training has played and continue to play elsewhere in the world, the Tanzanian Government embraced vocational training as a tool for the development of SSEs in the country (VETA, 2003). Thus, in 1994, Vocational Educational and Training Authority (VETA) was established as an autonomous government agency responsible for coordinating, regulating, financing and providing vocational educational and training in the country (VETA, 2003).

1.3 Statement of the Problem

The government of Tanzania has taken some initiatives to transfer skills and knowledge in SSEs by building Vocational Training Centres (VTC) in each region. The purpose is to impart technical skills and innovative ideas to entrepreneurs so as to exploit market opportunities when setting up their enterprises. Several years have now passed since introduction of Vocational Training Programme. Experience shows that this kind of training is supposed, among other things, to equip trainees with practical innovative skills and knowledge. In Tanzania, very few studies have shown the performance of the entrepreneurs who have acquired skills through VETA. Therefore, this study was a modest attempt to shade some lights on this.

1.4 Objectives of the Study

1.4.1 Main Objective

The purpose of this study was to investigate the role of vocational educational and training centres in promoting technological innovation among SSEs, focusing on metal working enterprises.

1.4.2 Specific Objectives

- To examine innovativeness of the entrepreneurs who have acquired skills through VETA against Non-VETA
- To assess the marketing strategies used by entrepreneurs who have acquired skills through VETA against Non-VETA
- To find out the constraints to innovation facing entrepreneurs among SSEs

1.5 Research Questions

This study was guided by three research questions as follows:

- How innovative are entrepreneurs who have acquired skills through VETA against Non-VETA?
- What are the marketing strategies used by entrepreneurs who have acquired skills through VETA and that of Non-VETA?
- What are the constraints to innovation facing entrepreneurs among SSEs?

1.6 Significance of the Study

The research is expected to provide knowledge on the role of VETA in promoting technological innovation among small scale enterprises in Tanzania. In addition, it will contribute to policy formulation and strategic intervention by the government on VETA. Moreover, it provides empirical evidence about performance of metal enterprises in Tanzania in terms of innovative capabilities. Lastly, the study may also provide reference for other researchers intending to conduct studies on related issues.

1.7 Conceptual Framework

The conceptual framework used in this study is summarized in Figure 1. The assumption made from conceptual framework is that there is technological learning from VETA whereby trainees acquire skills and knowledge. Likewise, it assumes that trainees will make effective use of the skills and knowledge acquired from VETA to assimilate, use, adapt and change the existing technology. In connection to that, it is assumed that the trainees will have ability in making some modification of the existing technology, adaptation of new products and introduction of new machines. Therefore, the concepts used are interrelated in a way that reflects a holistic understanding of the subject matter. That is, technological learning is a function of technological capability, technical change and productivity capability.

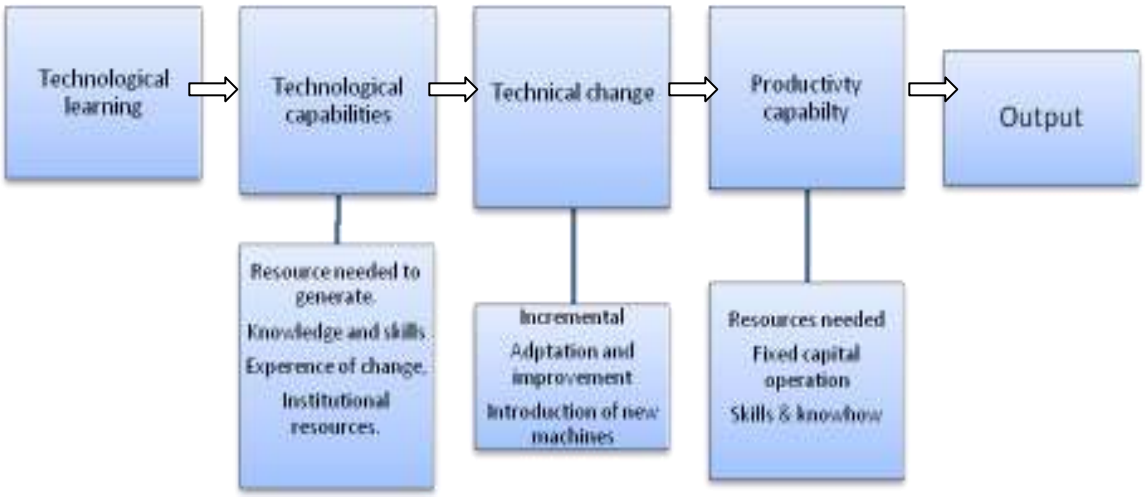

Figure 1: Technological Learning, capability, productivity and technical change. Adopted from Bell and Pivitt's (1993)

Using Bell and Pavitt's conceptual model, it is easy to see how entrepreneurs with a fixed set of technological capabilities may generate a stream of improvements in production capacity over time. Such improvements may be important in enabling entrepreneurs to modify or scale-up production. An entrepreneur with no technological capabilities at all, would be rigidly unable to adapt to any changes in its environment, and may not survive for long. Also, such an entrepreneur may not be able to change radically enough to bridge the discontinuities that occasionally arise in technical change, and may not be able to compete with others.

This study used this model of technological learning to study entrepreneurs who had undergone training by VETA. VETA acted as an institutional resource for

entrepreneur's technological acquisition. It was assumed that entrepreneurs with technological capabilities from VETA might generate a stream of improvements in production capacity over time than Non-VETA.

1.8 Limitations of the Study

It was very difficult for the researcher to get entrepreneurs trained by VETA because few of them had managed to establish their own enterprises. Therefore, much more time was used than was originally planned. On top of that, power interruption was a problem during dissertation writing process.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter provides the surveyed literature. It begins with definition of terms relating to the topic under study, namely: “innovation”, “technological learning’’ and “technological capabilities’’. Moreover, the chapter presents an overview of VETA technological capability building and role of small scale enterprises in Tanzania. The chapter aims at finding what other researchers have said in relation to the study topic and to identify the literature gap.

2.2 Innovation

Howell and Higgs (1990) define innovation as “the process by which entrepreneurs convert opportunities into marketable ideas’’. The concept of Innovation “has also defined as practice of bringing inventions into widespread usage, through creative thinking, investment and marketing’’ (Nelson, 1993). Further, innovation is a “complex interaction between human activities, technology, market place, and the interaction must typically happen between all three realms before an innovation has significant economic impact’’

In addition, innovation means as successful application of new knowledge in products and process (Aristid, 2010). This can be either incremental or radical innovation. Incremental innovations are the improvements in the already existing process and products, making them better, faster, and cheaper; and this is sometimes called “market

pull innovation''. While radical innovation is when an entirely new products and process are introduced; and this is sometimes called "technological push'' innovation.

Even so, innovation does not have to be scientific breakthrough like laser. It can be a simple machine adapted and modified at work places. This kind of machine helps workers to increase their productivity to a level beyond subsistence (UN, 2005).

It is worthwhile to point out that technological innovation is unavoidable for enterprise which wants to develop and maintain a competitive advantage and/or gain entry in to new markets (Becheikh *et. al.* 2006). In this, there is substantial evidence that show a number of SSEs in Asian countries do engage in technological innovations, and that these innovations have been important determinant of their success (Hoffman *et. al.* 1998).

At this point, it is worthwhile to advance the fact that technological innovation plays a central role in increasing capabilities of SSEs to meet the unmet demands. Thamhain (1996) theorises that the enterprises that are able to leverage technological innovation to achieve superior performances, new features, and lower cost will add the largest value to their products and eventually compete more effectively in the market. In supporting the statement, Franco (1989) studied 15 major industries in Asia and Europe. The results show that the UK firms lost global market share to Asian firms because they neglected investment in innovation.

Furthermore, one of the striking facts about technological innovation for SSEs is its value-added creation capabilities. It is generally acknowledged that technological innovation creates value added in two ways. First, it directly improves the value of end product or service to its customers. Secondly, technological innovation improves the work process of creating, developing, producing, delivering, and servicing the product. Arguably, the enterprises that are able to survive and prosper in the decades ahead will be those capable of managing technological innovation and derive business from it (Thamhain, 1996)

In modern businesses, entrepreneurs see invention by scientists as creating opportunities for new combination of functions of production (Shane, 1994). Literature by Austrian economist Schumpeter (1947) shows that he was the founder of the idea of innovation and creative destruction. He defined innovation as "to create or use something new". This always goes together with the loss of old products and processes, Schumpeter calls this "creative destruction''. Schumpeter (1947) considered that the term "innovation'' fits into five categories namely;

- Introduction of a new product or a qualitative change of an existing product;
- Process innovation which is new for a business sector;
- Opening of a new market;
- Development of new resources; and
- Change in the organization and management.

This study limited itself to the introduction of new products, process innovation and opening of a new market.

2.3 Types of Innovation

Experts have identified four types of innovation such as products innovation, process innovation, market innovation and organizational innovation. For the purpose of this study, only three types of innovation were identified from extensive literature review.

2.3.1 Product Innovation

Product innovation is the creation and subsequent introduction of goods or services that are either new or improved to the firm. Reiner (2005) specifies that product innovation involves the conceptualization, design, development, validation, and commercialization of new products that provide superior solutions to the needs and expectation of customers, stakeholders and society.

2.3.2 Process Innovation

Process innovation encompasses the envisioning of new work strategies, the actual process design activity, and implementation of the change in its entire complex technological, human, and organizational dimensions (Davenport, 1993). Generally, process innovation captures introduction of new production method, new management approaches to the market at a timely fashion.

2.3.3 Market Innovation

Refers to a newness of approaches that a firm adopts to enter and exploit the targeted market. Normally, market innovation is concerned with the marketing of new products, and covers activities in connection with the launching of the new products. In marketing and launching of the new products variety of promotion and advertisements such as TV

show, business card, brochures, firm website and social networks can be used (Yang, 2004).

2.4 Technological Learning

Technological learning and innovation are the key determinants of the growth and competitiveness of enterprises. Evidence from the field of economics suggests a positive relationship between technological learning and firm productivity (Blundell *et. al.* 1999). The fact is that training activity is associated with a continuous learning culture that stimulates both managers and employees to innovate and improve their ability to assimilate and utilize the new information. Technological learning can be formal or informal. Formal technological learning takes place in education and training institutions such as universities, colleges and training centers, while informal technological learning is associated with unconventional processes embedded in work activities, such as observing, asking questions, problem-solving, project work, coaching and being part of multi-disciplinary teams. Besides these practical advantages, informal learning is understood as beneficial for transfer of knowledge and skills (Eraut, 2004).

2.5 Technological Capability

Technological capability is defined as "the ability to create, change or improve products, processes and production organization, or equipment''**.** It may be described as change-generating capability, consisting of technology-changing skills, knowledge, experiences and organizational arrangements. This depends on investment capabilities, production capabilities, and linkage capabilities (Lall, 1992).

“Investment capabilities’’ are the skills needed to identify, prepare, design, construct, equip, staff, and commission a new facility (Lall, 1992). They determine the capital costs of the project, the appropriateness of the scale, product mix, technology and equipment selected, and the understanding gained by an operating firm of the basic technologies involved. Therefore, investment capabilities are those skills which lead to establishment of an enterprise.

Lall postulates further, that “production capabilities’’ range from basic skills such as quality control, operation, and maintenance, to more advanced ones such as adaptation, improvement or equipment “stretching,” to the most demanding ones of research, design, and innovation. Both investment and production capabilities cover both process and product technologies as well as the monitoring and control functions included under industrial engineering. The skills involved determine not only how well the given technologies are operated and improved, but also how well in-house efforts are utilized to absorb the technologies bought or imitated from other enterprises

On the other hand, “linkage capabilities’’, are the skills needed to transmit information, skills and technology to, and receive them from, component or raw material suppliers, subcontractors, consultants, service firms, and technology institutions. Such linkages affect not only the productive efficiency of the enterprise, but also the diffusion of technology through the economy and the deepening of the industrial structure, both essential to an enterprise development. Therefore, for the purpose of this study the focus was on the production capabilities.

2.6 Vocational Training in Technological Capability Building

The history of vocational education in Tanzania dates back to 1940 when the Apprenticeship Ordinance was enacted to guide training in the industry. They were also intended to produce skilled and semi skilled workers for the industrial sector (Kahindi, 1996). The Apprenticeship Ordinance of 1940 was replaced by the Vocational Training Act of 1974, which established the National Vocational Training Division (NVTD) under the Ministry of Labour.

The 1974 Act was replaced by the 1994 Vocational Educational and Training Act, which established Vocational Educational and Training Authority (VETA) as an autonomous government agency responsible for coordinating, regulating, financing and providing vocational educational and training (VETA, 2003). Its main areas of focus are:

i. To provide vocational education and training which is demand driven and relevant in order to meet the training needs of both formal and the informal sectors of the economy (Private enterprise development);
ii. To ensure quality of training which also integrates training in life skills;
iii. To foster equality and fight poverty through provision of training which is flexible, accessible and equitable considering gender, geographical distribution and disadvantage groups;
iv. To promote and implement training schemes which support the development of small and medium enterprises;

v. To develop and implement training concepts which focus on promoting entrepreneurship that will equip and enable VETA graduates establish viable small and medium enterprises and

vi. To develop and implement special skills training packages to support national social and economic development plans.

It is further clarified by the United Republic of Tanzania (1995) that vocational training constitutes instruction in skills, which enable trainee to develop expertise in a particular group of techniques or technology. Education and training provided by VETA is one aspect of enterprise development and the process of human resource development and utilization (Ishumi, 1998). It focuses on the development and transfer of skills, knowledge that enable recipient to perform task effectively. In addition, VETA is critical in the transfer of technology and the key in development of the SSEs (Moshi, 2010).

In connection to that, Shein (2010) points out that the government intends to promote vocational training as one of the pillars of economic development in the country as it develops human resources. He cites examples of German and Republic of Korea as the countries that have achieved tremendous economic achievements through human resource development.

Vocational training has had profound influence on development worldwide. Historically, it supported the industrial revolution by producing required artisans. It is also recognized as one the key factors that have contributed to the unique and rapid industrialization in South Korea and Singapore (known to have the world's most productive forces)

fostering higher productivity and scaling down the level of unemployment (Mahigig, 2001).

Research on vocational training and innovation among micro enterprises was conducted in Ethiopia by Mulu (2009). The enterprises covered a wide variety of non agricultural activities such as manufacturing, trade and services. In innovation, respondents were asked the following question. *Did you make an important improvement/change to your product recently?* Those, who said yes, were then asked to disclose what type of improvement was involved. Researcher categorized them into types of innovative activities such as product/service innovation, process (machinery and equipment) organizational and skills improvement (improving the skills of workers and managers) and marketing (more advertisement). The researcher tested the association between innovation and owners education. The results indicated that owners with vocational training were innovative, while those with no training were less capable. This provides strong evidence that vocational training have positive effects on innovation activity in Ethiopia.

2.7 Small Scale Enterprises and its Contribution to Economic Growth

There has been no clear-cut definition of the term "SSEs.'' Different scholars and authors have used various criteria in defining them. Two examples have been used to explain the argument. Kenya has used a variety of criteria to include the number of employees, value of products and annual sales in defining Small Scale Enterprises. Therefore, in Kenya, small scale enterprises employ 10 to 50 persons (Republic of

Kenya, 1989). In Tanzania, Small Scale Industrial Development Organization (SIDO) clarifies that small enterprises have up to 49 employees (Matambalya, 2002).

SSEs are an important force for economic development and industrialization in developing countries. The sector produces affordable goods, services and creates jobs and thus contributes significantly to the country's development and economic growth (Chao, 1988). Kent (1995) argued that small scale enterprises require less capital investment and shorter gestation period and provide employment to a larger number of people. Therefore, SSEs help to increase the income of people and that of the nation.

2.8 Literature Gap

Studies have shown that vocational education and training are important in promoting technological innovation among SSEs in the world and Tanzania in particular. Nonetheless, little was known about performance of those enterprises owned by entrepreneurs who have undergone training by VETA. For this reason, the study investigated the performance of the entrepreneurs trained by VETA against Non-VETA.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology which was used in this study. The chapter is composed of the description of the study area, sampling techniques and sample size. Other components are data collection methods and techniques, research approach and data analysis.

3.2 Study Area

The study was carried out in Dar as Salaam. This is because most of SSEs in Tanzania are located in urban centers. Hence, Dar as Salaam was considered the most appropriate because it is the most industrialized region in Tanzania. The facts that the VETA headquarters are located in Dar es Salaam attest to significance of the region. Also, it provides market potential to manufactured products due to an increase in the number of population. Among three Districts of Dar es Salaam, Kinondoni was chosen because it is a newly emerging industrial area for entrepreneurs compared with Ilala and Temeke, which have been industrial areas for entrepreneurs for a long time. Likewise, metal working enterprises were selected because they hold 23 percent of SMEs activities (Mwamila and Temu, 2006). Due to this, its activities impact on the day-to-day life of the people.

3.3 Research Approach

The researcher used mixed approaches in conducting the research. These are qualitative, quantitative and case study approaches. Qualitative approach was used in collecting respondents' views during the interviews and observation while quantitative approach was used to collect information from respondents through questionnaire. On the other hand, case studies were used to offer description, provide in depth and detailed empirical information so as to provide a more comprehensive understanding of the study topic.

3.4 Population

In this study, the target population comprised different stakeholders. These included the metal working entrepreneurs who had received training through VETA and those with apprenticeship before joining VETA and Non-VETA. In addition, Heads from market departments, instructors, and students of Chan'gombe Vocational Training College were involved. Each category of respondents provided some information which was useful for this study.

3.4.1 Sample Size

Data were collected from metal working enterprises operating in Kinondoni. The sample size of this study consisted of sixty eight (68) respondents including twenty entrepreneurs with vocational training, twenty with apprenticeship and who later joined VETA and twenty with apprenticeships, two instructors, four students and two heads from VETA in Chang'ombe Vocational Training College.

3.4.2 Sampling Techniques

In order to identify VETA and non VETA entrepreneurs, snowball sampling techniques were used. This is because high mobility among entrepreneurs could not allow other techniques. After distinguishing VETA or Non-VETA respondents, data were obtained from them through questionnaire and interviews. Likewise, purposive sampling was used to obtain instructors, students and heads of VETA at Chang'ombe Vocational Training College.

3.5 Data Collection Methods

Both primary and secondary sources were used to collect data. In this study, three types of data collection instrument were used namely; Questionnaire, interviews and field observation. The secondary sources were the written materials (both published and unpublished) such as, books, reports, journals and articles. These were obtained from the University of Dar as salaam main library.

3.5.1 Questionnaire

Questionnaire are of two types; open-ended and close ended. Both of them were used. Questionnaire was administered to owners of the sampled metal working enterprises. The advantage of using open-ended questions was that respondents had opportunities for unlimited expression of their perspectives. Closed ended-questions were also useful because they allowed respondents to answer the given items by cross checking the categories.

3.5.2 Interviews

Unstructured interviews were conducted to owners of the studied metal working enterprises and instructors, students and heads of Chango'mbe Vocational Training College. The method was advantageous because it allowed direct questions to respondents about their activities. In other words, it allowed the researcher to gather subjective opinion as well as factual information. This is because during the interview, the researcher and respondents were both present and the questions were being asked and answered. Also, it was possible to raise other spontaneous questions emerging from the interview.

3.5.3 Field Observations

Physical visit was made in metal working enterprises. This method was used to gather information on the nature of material present, equipment and kind of products produced. This method provided the first hand information on how different kinds of activities were being conducted and the skills and knowledge that were being applied. Also, it allowed the researcher to take photographs of the products which were being produced for more illustration during data analysis.

3.6 Validity and Reliability of Data

To ensure validity and reliability of data, questionnaire were developed in line with research questions. The researcher discussed the questionnaire with the supervisor, an expert of Science Technology and Innovation (STI) for comments and improvements.

Thereafter, the questionnaire were pilot tested to four metal working enterprises at Kinondoni. Finally, the refined questionnaire were used in the actual field work.

3.7 Data Analysis

Aspects indicated on the questionnaire on the role of VETA in promoting technological innovation in metal working enterprises were examined. Data were analyzed to measure the rate of innovation, constraints to innovation and marketing strategies. Innovation was measured in terms of number of new and improved products and process that were successfully introduced to the market in the previous five years. Therefore, the study used qualitative, quantitative and case studies methods for data analysis. The qualitative data were categorized according to themes which related with the research objectives. Upon completion of the field process, all obtained quantitative data were coded, organized, analyzed and converted into tables, frequencies by using Statistical Package for Social Sciences (SPSS) Computer Software.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents analyses and discusses research findings which were collected after data collection. The presentation, analysis and discussion focused on three research objectives and questions assigned to them. The sub-sections of this chapter are respondent's characteristics, extent of innovation among the studied entrepreneurs, marketing strategies and constraints to innovation among them.

4.2 Basic Information about Respondents

This sub section- begins with an analysis of respondents characteristics. It gives a general picture for innovativeness by assessing at the owner's experience in metal working and education qualifications. For the purpose of this work, all three categories of entrepreneurs are defined in order to familiarize the reader with them. Therefore, "VETA'' are metal working entrepreneurs who have attended only formal technological learning in VETA centres. On the other hand, "Apprenticeship and VETA'' are metal working entrepreneurs who have attended informal technological learning in apprenticeships and later joined formal technolological learning in VETA. However, "Non-VETA'' are metal working entrepreneurs who have attended only informal technological learning in apprenticeships.

Table 1: Level of Entrepreneurs Education

No	Category	VETA entrepreneurs (N=20)	Apprenticeship and VETA entrepreneurs (N=20)	Non-VETA entrepreneurs (N=20)
1	Primary school	11 (55%)	12 (60%)	9 (45%)
2	Secondary school	9 (45%)	8 (40%)	11 (55%)

Source: Survey data, 2011.

Findings showed that 11 (55%) VETA entrepreneurs, had primary education and 9 (45%) had secondary education. On the other hand, entrepreneurs with apprenticeship and VETA, 12 (60%) had primary education and 8 (40%) had secondary education. However, 9 (45%) Non- VETA entrepreneurs had primary education and 11 (55%) had secondary education. The findings show that majority of metal entrepreneurs had completed primary and secondary education. No diploma holders and university graduates were found engaged in metal working. That may imply that graduates show no interest in metal working because they consider it suitable for uneducated people.

Table 2: Entrepreneurs Working Experience

No	Years of working experience	VETA entrepreneurs (N=20)	Apprenticeship and VETA (N=20)	Non-VETA entrepreneurs (N=20)
1	1-5	6 (30%)	7 (35%)	9 (45%)
2	6-10	7 (35%)	8 (40%)	7 (35%)
3	11 and above	7 (35%)	5 (25%)	4 (20%)

Source: Survey data, 2011.

Findings showed that VETA 6 (30%) entrepreneurs had five or less years of working experience, 7 (35%) had between 6-10 years and 7 (35%) had more than ten years of

working experiences. Further, 7 (35%) entrepreneurs with apprenticeship and VETA had five or less years of working experience, 8 (40%) had between 6-10 years and 5 (25%) had more than ten years of working experience. However, 9 (45%) Non-VETA entrepreneurs had five or less years of working experience, 7 (35%) had between 6-10 years and 4 (20%) had more than ten years of working experience. This indicates that VETA entrepreneurs had many years of experience in metal working than Non-VETA entrepreneurs.

4.3 Characteristics of the Enterprises

After analyzing entrepreneur's characteristics, this part provides an analysis of enterprise characteristics. It gives a general picture for innovativeness by considering enterprise's age, ownership, and number of workers, product produced and production equipment present.

Table 3: Age of the Enterprises

No	Age of the enterprise	VETA enterprises (N=20)	Apprenticeship and VETA enterprises (N=20)	Non-VETA enterprises (N=20)
1	1-5	8 (40%)	9 (45%)	13 (65%)
2	6-10	9 (45%	8 (40%)	7 (35%)
3	11 and above	3 (15%)	3 (15%)	0 (0%)

Source: Survey data, 2011.

It was found that 8 (40%) of the enterprises owned by VETA entrepreneurs were five or less years, 9 (45%) had between 6-10 years and 3 (15%) had more than ten years. Additionally, the enterprises owned by entrepreneurs with apprenticeship and VETA, 9

(45%) were five or less years, 8 (40%) had between 6-10 years and 3 (15%) had more than ten years. However, 13 (65%) enterprises owned by Non-VETA entrepreneurs had five or less years and 7 (35%) had between 6-10 years. Therefore, in comparing when the enterprises were established, the results showed that most of the enterprises owned by Non-VETA entrepreneurs were relatively young. Most of them had less than ten years old.

Table 4: Ownership of the Enterprises

No	Enterprises ownership	VETA enterprises (N=20)	Apprenticeship and VETA enterprises (N=20)	Non- VETA enterprises (N=20)
1	Sole proprietors	11 (55%)	12 (60%)	11 (55%)
2	Joint venture	7 (35%)	8 (40%)	6 (30%)
3	Company	2 (10%)	0 (0%)	3 (15%)

Source: Survey data, 2011.

Findings showed that 11 (55%) enterprises owned entrepreneurs operated as sole proprietors, 7 (35%) as a group and the remaining 2 (10%) as companies. Moreover, 12 (60%) of the enterprises owned by entrepreneurs with apprenticeship and VETA operated as sole proprietors and 8 (40%) as a group. Moreover, 11 (55%) enterprises owned by Non-VETA entrepreneurs operated as sole proprietors, 6 (30%) as a group and 3 (15%) as companies. Findings revealed that metal working enterprises are owned by one individual who takes the whole business operation and other enterprises are operating in joint venture as partners who had agreed to invest their skills, knowledge and capital so as to share profits. Few enterprises are operating as companies registered by BRELA. They have business number, name of business, street, district and region.

Table 5: Number of Workers Working in the Enterprises

No	Number of workers in the enterprises	VETA enterprises (N=20)	Apprenticeship and VETA (N=20)	Non-VETA enterprises (N=20)
1	1-5	17 (85%)	15 (75%)	15 (75%)
2	6-10	3 (15%)	5 (25%)	5 (25%)
3	11 and above	0 (0%)	0 (0%)	0 (0%)

Source: Survey data, 2011.

The study found that 17 (85%) of the enterprises owned by VETA entrepreneurs, had five or less workers and 3 (15%) had between 6-10 workers. Moreover, 15 (75%) enterprises owned by entrepreneurs with apprenticeship and VETA had five or less workers and 5 (25%) had between 6-10 workers. Further, 15 (75%) enterprises owned by Non-VETA entrepreneurs, had five or less workers while 5 (25%) had between 6-10 workers. These results showed that most of the metal working enterprises had five or less workers.

Table 6: Type of Products Produced by the Enterprises

No	Products produced	VETA enterprises (N=20)	Apprenticeship and VETA enterprises (N=20)	Non-VETA enterprises (N=20)
1	Construction equipment	11 (55%)	14 (70%)	15 (75%)
2	Motor vehicle parts	7 (35%)	1 (5%)	1 (5%)
3	Metal furniture	2 (10%)	5 (25%)	1 (5%)
4	Food processing equipment	0 (0%)	0 (0%)	3 (15%)

Source: Survey data, 2011.

It was found that the enterprises owned by VETA entrepreneurs, 11 (55%) produced construction equipment, 7 (35%) motor vehicle parts and 2 (10%) metal furniture. On the contrary, the enterprises owned by entrepreneurs with apprenticeship and VETA, 14

(70%) produced construction equipment, 1 (5%) motor vehicle parts and 5 (25%) metal furniture. Also, enterprises owned by No-VETA entrepreneurs, 15 (75%) produced construction equipment, 1 (5%) motor vehicle parts, 1 (5%) metal furniture and 3 (15%) food processing equipment. This shows that construction technology was dominant in metal working enterprises in Dar as salaam.

Assessment of equipment present in the enterprises showed that all enterprises are using the welding machines, grinding machines, drilling machines, cutting discs and rewinding machines. It was noted that the enterprises were using simple equipment of which some are made by the enterprises and others are bought at hardware shops. In relation with sources of raw materials used, 59 (99.4%) enterprises obtained their raw materials locally, only 1 (1.6%) enterprise got the raw materials from foreign sources. The study showed that while all the raw materials for metal production such as angle line, aluminum sheets and steel iron were available in shops at Kariakoo Market Complex, only one enterprise imported materials from China.

4.4 Extent of Innovation among the Enterprises

This subsection focuses on the issue of innovation by comparing three groups of entrepreneurs namely; VETA, apprenticeship and VETA and Non-VETA. The aim was to assess whether the skills and knowledge provided by VETA are helping their trainees to be innovative or not. Entrepreneurs are considered to be innovative if they had introduced new products to the market or had adopted new products or improved the

existing products and process in past five years. For the purpose of this study, five years are sufficient to generalize entrepreneur's information.

4.4.1 New Product Innovation

This is the type of innovation introduced to the market for the first time. The enterprise introduce product that are not produced by other enterprises. Findings revealed that enterprises owned by VETA entrepreneurs, those owned by entrepreneurs with apprenticeship and VETA and those owned by Non-VETA entrepreneurs had no new product innovation. This implies that it is hard to get new product innovation among small scale entrepreneurs in Dar as salaam. This is because new product innovation needs equipped skilled staffs; capital and laboratory. Therefore, it is most likely that small entrepreneurs are at risk of not being able to compete in the current world of globalization which is marked by technological innovations and market competitions.

4.4.2 Adoptive Product Innovation

This is a type of innovation which is only new to an enterprise. This means that enterprises are producing the products that were developed and produced by other enterprises exactly as they are without upgrading them. They embody innovation because entrepreneurs have applied skills and knowledge in mastering them. Table 7 below shows the number of entrepreneurs who were found to have this kind of innovation.

Table 7: Entrepreneurs with Adoptive Product Innovation

Category of entrepreneurs	Number of innovations achieved in last five years	Number of entrepreneurs (N=60)	Total number of innovations achieved	Total frequency number of innovations achieved
VETA entrepreneurs	0	4 (6.7%)	0	25
	1	8 (13%)	8	
	2	7 (11.3%)	14	
	3	1 (1.7%)	3	
Apprenticeship and VETA entrepreneurs	0	4 (6.7%)	0	34
	1	7 (11.7%)	7	
	2	4 (6.7%)	8	
	3	3 (5.0%)	9	
	4	1 (1.7%)	4	
	5	0 (0%)	0	
	6	1 (1.7%)	6	
Non-VETA entrepreneurs	0	2 (3.3%)	0	39
	1	3 (5.0%)	3	
	2	12 (20%)	24	
	3	1 (1.7%)	3	
	4	1 (1.7%)	4	
	5	1(1.7%)	5	

Source: Survey data, 2011.

Table 7 shows that 4 (6.7%) VETA entrepreneurs had not adopted any product, 8 (13.3%) adopted 1 product, 7 (11.7%) adopted 2 products and 1 (1.7%) adopted 3 products, making a total of 25 products.

Plate 1: Adopted Bicycle for Disabled People (Wheel chair)

Source: Survey data, 2011.

This bicycle was made by one VETA entrepreneur. According to this entrepreneur, this bicycle was much more common imported from abroad for many years. Then it was adopted and mastered by him to the extents he was able to make it. In the process of making it, entrepreneurs produced only the frames while other parts are purchased such as seat covers, tires, chain, pedal and brakes. Therefore, entrepreneur makes assemblage of all parts to produce a complete bicycle.

Table 7 shows that 4 (6.7%) apprenticeship and VETA entrepreneurs had not adopted any product, 7 (11.7%) adopted 1 product, 4 (6.7%) adopted 2 products, 3 (5.0%) adopted 3 products, 1 (1.7%) adopted 4 products, 1 (1.7%) adopted 6 products, making a total of 34 products.

Further, Table 7 shows that 2 (3.3%) Non-VETA entrepreneurs had not adopted any product, 3 (5%) adopted 1 product, 12 (20%) adopted 2 products, 1 (1.7%) adopted 3 products, 1 (1.7%) adopted 4 products, 1 (1.7%) adopted 5 products, making a total of 39 products. Below is one example of kind of the adopted products.

Plate 2: Adopted Motor Vehicle

Source: Survey data, 2011.

This motor vehicle was made by one Non –VETA entrepreneur. The entrepreneur had several times observed how imported motor vehicle from abroad functioned. He studied how breaks, tires, clutch, spring, batteries, filters, gear box, engine and chassis were assembled. After that, he made a local assemblage motor vehicle by using scrapers and grain milling diesel engine (11HP) in his workshop.

In sum, Table 7 shows that VETA entrepreneurs had adopted 25 products compared to 34 of those with apprenticeship and VETA and 39 of Non-VETA. Findings mean that VETA entrepreneurs had more adoptive products followed by those with apprenticeship and VETA. Those who have acquired skills from VETA have least adopted products, which is an indication of low practical skills and knowledge.

4.4.3 Incremental Product Innovation (Modified Products)

These are products that entrepreneurs have adopted and then mastered to an extent that they have upgraded them to make even better products. These products can be improved through the use of higher performance materials or by adding something new to the products. This is innovation because entrepreneurs have applied their skills and knowledge to make some modifications. Findings are shown in Table 8

Table 8: Entrepreneurs with Incremental Product Innovation

Category of entrepreneurs	Number of innovations achieved in last five years	Number of entrepreneurs (N=60)	Total number of innovations achieved	Total frequency number of innovations achieved
VETA entrepreneurs	0	12(20%)	0	12
	1	4 (6.7%)	4	
	2	4 (6.7%)	8	
	3	0 (0%)	0	
Apprenticeship and VETA entrepreneurs	0	9 (15%)	0	21
	1	3 (5%)	3	
	2	6 (10%)	12	
	3	2 (3.3%)	6	
Non-VETA entrepreneurs	0	7 (11.7%)	0	24
	1	4 (6.7%)	4	
	2	7 (11.7%)	14	
	3	2 (3.3%)	6	

Source: Survey data, 2011.

Table 8 shows that 12 (20%) VETA entrepreneurs had not modified any product, 4 (6.7%) modified 1 product, 4 (6.7%) modified 2 products, making a total of 12 modified products. Findings revealed that the studied entrepreneurs had low skills and knowledge to an extent that 20 percent had failed to make some modifications of the adopted products. On the contrary, 9 (15%) entrepreneurs with apprenticeship and VETA had not modified any product, 3 (5%) modified 1 product, 6 (10%) modified 2 products and 2 (3.3%) modified 3 products, making a total of 21 modified products. These results indicate that about 18 percent of the studied entrepreneurs had applied skills and knowledge to make some change on the adopted products. Also, data shows that, 7 (11.7%) Non-VETA entrepreneurs had not modified any product, 4 (6.7%) modified 1 product, 7 (11.7%) modified 2 products and 2 (3.3%) modified 3 products, making a total of 24 modified products. The results indicate that 21.7 percent of Non-VETA

entrepreneurs had made some modifications of the adopted products. This is an indication of high entrepreneurial innovative skills and knowledge.

Thus, VETA entrepreneurs had modified 12 products compared with 21 of those with apprenticeship and VETA and 24 of the Non-VETA. The findings mean that Non-VETA entrepreneurs had more modified products followed by those with apprenticeship and VETA. This is because of the practical advantage in work activities that equipped Non-VETA entrepreneurs with more innovative skills and knowledge.

4.4.4 Adoptive Process Innovation

These are production processes introduced by entrepreneurs for the first time but they have been in use or made elsewhere. They are innovations because entrepreneurs have applied their skills and knowledge in the process of making them.

Table 9: Entrepreneurs with Adoptive Process Innovation

Category of entrepreneurs	Number of innovations achieved in last five years	Number of entrepreneurs (N=60)	Total number of innovations achieved	Total frequency number of innovations achieved
VETA entrepreneurs	0	13 (21.7%)	0	10
	1	5 (8.3%)	5	
	2	1 (1.7%)	2	
	3	1 (1.7%)	3	
Apprenticeship and VETA entrepreneurs	0	11 (18%)	0	15
	1	4 (6.7%)	4	
	2	4 (6.7%)	8	
	3	1 (1.7%)	3	
Non-VETA entrepreneurs	0	9 (15%)	0	19
	1	4 (6.7%)	4	
	2	6 (10%)	12	
	3	1 (1.7%)	3	

Source: Survey data, 2011.

Table 9 shows that 13 (21.7%) VETA entrepreneurs had not adopted any process innovation, 5 (8.5%) adopted 1 process, 1 (1.7%) adopted 2 processes and 1 (1.7%) adopted 3 processes, making a total of 10 processes. These results revealed that most of the studied entrepreneurs have inadequate practical skills and knowledge on the innovation adopting process.

It was found that 11 (18.5%) entrepreneurs with apprenticeship and VETA had no process innovation of the adoptive type, 4 (6.7%) adopted 1 process, 4 (6.7%) adopted 2 processes and 1 (1.7%) adopted 3 processes, making a total of 15 processes. Below is an example of adopted process innovation by two entrepreneurs.

Plate 3: Adopted Grain Milling Machine (Process Innovation)

Source: Survey data, 2011).

This machine was made by two entrepreneurs with apprenticeship and VETA. These entrepreneurs said that the machine was a replica of a commonly type which had been imported from abroad for many years. It was adopted and mastered by them to the extent of being able to make it. In the process of making it, entrepreneurs produced only housing while other parts are purchased such as motor, fane belt and engine. Therefore,

entrepreneurs make assemblage of all parts to produce a complete machine. The capacity is 200kg/hour; power input 11HP electric motor 3 phase.

Moreover, 9 (15%) Non-VETA entrepreneurs had no process innovation of the adoptive type, 4 (6.7%) adopted 1 process, 6 (10%) adopted 2 processes and 1 (1.7%) adopted 3 processes, making a total of 19 adopted processes. Below is an example of a kind of adopted process innovation made by three entrepreneurs.

Plate 4: Block Mixer Machine

Source: Survey data, 2011.

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This mixer machine was made by three Non-VETA entrepreneurs. The entrepreneurs reported that the machine originally imported from China and South Africa. Then it was adopted and mastered by them to an extent that they were able to make it. In the process of making it, entrepreneurs produced only housing while other parts were purchased such as dif, motor, chain and engine. Therefore, entrepreneurs made assemblage of all parts to produce a complete mixer machine. The capacity is 334 litters and power is 8 HP electric motor 3 phase.

Therefore, findings revealed that Non-VETA entrepreneurs had adopted 19 processes innovation compared with 15 of those with apprenticeship and VETA and 10 of that trained by VETA. The findings suggest that Non-VETA entrepreneurs had adopted more

process innovation followed by those with apprenticeship and VETA, while those with vocational training had adopted least process innovation. This means that the role of vocational training in imparting practical knowledge to their trainees is minimal.

4.4.5 Incremental Process Innovation

These are the production processes that entrepreneurs have adopted and mastered to an extent of making some modifications which make them better than the original version or cope with the environment. It is an innovation because the entrepreneurs have applied their skills and knowledge to make some modifications.

Table10: Entrepreneurs with Incremental Process Innovation

Category of entrepreneurs	Number of innovations achieved in last five years	Number of entrepreneurs (N=60)	Total number of innovations achieved	Frequency of total number of innovations achieved
VETA entrepreneurs	0	12 (20%)	0	16
	1	5 (8.3%)	5	
	2	1 (1.7%)	2	
	3	1 (1.7%)	3	
	4	0 (0%)	0	
	5	0 (0%)	0	
	6	1(1.7%)	6	
Apprenticeship and VETA entrepreneurs	0	11 (18.3%)	0	21
	1	5 (8.3%)	5	
	2	0 (0%)	0	
	3	2 (3.3%)	6	
	4	1 (1.7%)	4	
	5	0 (0%)	0	
	6	1 (1.7%)	6	
Non-VETA entrepreneurs	0	5 (8.3%)	0	42
	1	3 (5%)	3	
	2	4 (6.7%)	8	
	3	4 (6.7%)	12	
	4	2 (3.3%)	8	
	5	1 (1.7%)	5	
	6	1 (1.7%)	6	

Source: Survey data, (2011).

Findings revealed that 12 (20%) VETA entrepreneurs had not modified any process, 5 (8.3%) had modified 1 process, 1 (1.7%) had modified 2 processes, 1 (1.7%) had modified 3 processes, making a total of 10 modified processes.

It was also found that 11 (18.3%) entrepreneurs with apprenticeship and VETA had not modified any process, 5 (8.3%) modified 1 process, 2 (3.3%) modified 3 processes, 1 (1.7%) modified 4 processes, 1 (1.7%) modified 6 processes, making a total of 21 modified processes.

Plate 5: Modified Vibrated Block Making Machine

Source: Survey data, 2011

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This machine was made by four entrepreneurs with apprenticeship and VETA. It shows an instance of block making machines development starting from manual to vibrator machines. Previously, it was a hand block making machine. Later, it was modified by adding vibration that adds strength to the blocks. It gave it better finish and turned it into a vibrator block machine. It is

upgraded to produce two pieces of blocks so as to get many pieces of block within a short time. The capacity is 240 bricks per hr; power is 5HP electric motor 3phase.

Data show that 5 (8.3%) Non-VETA entrepreneurs had not modified any process, 3 (5%) modified 1 processes, 4 (6.7%) modified 2 processes, 4 (6.7%) modified 3 processes, 2 (3.3%) modified 4 processes, 1 (1.7%) modified 5 processes, 1 (1.7%) modified 6 processes, making a total of 42 modified processes. The results revealed that these entrepreneurs possessed adequate practical knowledge of metal works. Their skills positively impacted on innovation since they have managed to do some modifications on the adopted processes.

Plate 6: Modified Hydraulic Block Making Machine

Source: Survey data, 2011.

This machine was made by one Non-VETA entrepreneur. It was a result from innovation of a vibrator block making machine. This happened when vibrator block machine was designed by a local artisan and used for a long time. Later on, the entrepreneur decided to make some improvement by fixing hydraulic

> which resulted into hydraulic block making machine. The aim was to produce a machine which would be used to press blocks using powerful force and produce many blocks for a short period of time with high strength and good finish. The capacity is 360 bricks per hour, two motors power; one for oil pump with 4HP and the other for vibration with 3HP electric motor.

Therefore, VETA entrepreneurs had 10 modified processes compared with 21 of those with apprenticeship and VETA and 42 of that with Non-VETA. Findings from the sample revealed that Non-VETA entrepreneurs had more process innovation of the incremental type, followed by those with apprenticeship and VETA. Those with vocational training had least incremental innovations.

Thus, Non-VETA entrepreneurs were more innovative than VETA entrepreneurs. This implied that practical work places equipped Non-VETA entrepreneurs with more innovative skills than VETA. As a result, entrepreneurs who graduated from VETA hired Non-VETA entrepreneurs for technical advice.

Comparing factors for innovation like owner's education, working experience and age of enterprises, findings revealed that there is negative relation between owner's education and experience in innovation. This is because VETA entrepreneurs were found to have more experience in metal working but they are less likely to engage in innovative activities relative to Non-VETA entrepreneurs. This is contrary to the view that vocational education in Tanzania is important in promoting entrepreneurship and innovation than general education. Findings revealed that vocational education negatively affects innovation in SSEs. In other countries such as Ethiopia, findings by Mulu (2009) revealed that vocational education entrepreneurs in SSEs were more

innovative while Non Vocational entrepreneurs were less capable. Therefore, in Ethiopia vocational training positively affects innovation.

In connection to that, findings revealed that there is negative correlation between age of an enterprise and innovation. VETA enterprises were old (with more than ten years) while Non-VETA enterprises were relative young (with less than ten years). The firms' age represent accumulative resources, market knowledge, and developed networks, thus older firms are more likely to be involved in innovation activities (Evans, 1987). In this study it is vice-versa. Findings revealed that Non-VETA enterprises were young but they were more innovative. In other countries such as Mauritius, study by Wignaraja (2002) found an evidence of relation between firm age and innovation and technological capabilities.

This discussion shows that vocational training has low ability in promoting entrepreneurship and innovation in Tanzania. This is because VETA has low ability to equip entrepreneurs with practical skills and knowledge. To verify this, entrepreneurs were asked to state whether VETA provided them with enough practical skills and knowledge or not. During the interview, entrepreneurs with apprenticeship and VETA said that training is more theoretical. This is caused by lack of enough teaching equipment such machines and materials for demonstration during practical. In support of this observation, one respondent said:

> *It was very difficult for me to gain enough skills during my studies at a Vocational training school because the teaching equipment were not enough; a lot of time spent on theoretical part. What I gained was only their certificate*

Another respondent was quoted saying:

> When *I was working in the street some people advised me to attend Vocational training. I agreed and registered for that. When I completed the training, I asked my self what knowledge I had added. I realized I had added only a certificate*

It is suggested in the quotations that entrepreneurs who graduated from VETA had gained certificates but had no practical skills. Gaining a certificate is part of academic performance, but is not the only qualification for entrepreneurs to be innovative. Innovation is measured by the skills and knowledge that were being applied.

The study explored whether vocational training imparted skills and knowledge to VETA entrepreneurs or not. Findings show that many entrepreneurs did not get practical skills and knowledge. They got enough practical skills after being retrained in the real field work settings. In support of this observation, one respondent stated;

> *The training imparted inadequate knowledge to me. After the training, I was trained afresh in a certain workshop where I was employed. It was that workshop that imparted sufficient skills and knowledge* to *me*

Another respondent said;

> *Vocational training equipped me with insufficient skills. I received more skills and enough knowledge informally at work place. VETA showed me only the direction*

It is suggested in the quotations that it was difficult for entrepreneurs to get enough practical skills and knowledge in VETA as VETA graduates sought for practical skills in apprenticeship. This shows that apprentices are better in providing innovative practical skills and knowledge than VETA.

After collecting the required information from entrepreneurs, a visit was made to VETA in Chang'ombe Vocational Training College (Head office) so as to get information related to the role of vocational training in Tanzania. An interview was conducted with two heads; one from administration and another from marketing department, four students and two instructors focusing on assessing the extent to which curriculum was effective in transferring skills and knowledge to trainees. They were also asked to state if they had enough facilities in their workshops for teaching and learning. Regarding training facilities, it was learnt that the studied vocational training centre had no training facilities for teaching and learning. For example, during the interview with vocational instructors, one instructor from welding and fabrication department said;

> *The facilities are not enough. Machines are too old. They have not been replaced since 1988. Due to lack of facilities, training for welding and fabrication has been reduced to two years from three years.*

He also noted that the curriculum content was not very much relevant to student needs. He was quoted saying:

> *We have been taught Form four Basic Mathematics. One should be taught skills only. Elementary mathematics knowledge is enough than confusing them with form four Basic Mathematics*

Similarly, head from Marketing Department said:

> *The Curriculum is not designed to suit Tanzanian students. The Curriculum should respect the local environment in the process of transferring skills. Practical training has been designed for one month. This will never add skills to students.*

Also head administration remarked*:*

> *Students are driven by the curriculum and not by the market. This means that once they graduate here and go to work, they apply the things found in the curriculum and not what the market demands. In this aspect, it will take time for them to be innovative.*

For more evidence, four students from welding and fabrication course at VETA Chango'mbe were interviewed so to get their views about the training. During the interview, they said that they had many subjects. Some remarked;

> *We knew that the studies should be welding only. We are now studying nine subjects which are a burden to us. We are in the second year. We are not doing any practical subject. We feel like we are wasting our time here*

The quotation emphasizes that VETA is facing many problems in imparting skills and knowledge to trainees. Some problems are caused by lack of enough training facilities such advanced equipment and properly designed curriculum.

Generally, as far as how training is conducted in VETA, in the studied vocational training college, it was revealed that training is conducted at three levels. These are level 1, 2 and level 3. Level one is one year which is all about introductory part of the courses. Level two (Second year) sometimes called "intermediate level,'' requires students to attend field training for three months. It was revealed that students attended one month field training and level three (Third year) is all about management. However, it was found that, in welding and fabrication department, the course lasted for two years instead of three years due to lack of enough facilities such as training materials, personnel, tools and equipment.

Apart from the actual training, vocational training provides related courses. These are English Language, Basic Mathematics, Entrepreneurs Skills, Engineering Science and Technical Drawing. Also, cross cutting subjects are provided to all VETA trainees such as life skills, HIV and drug abuse. An assessment of the trainees revealed that several approaches have been established. They have established Competence Based Education and Training (CBET) approach. This approach emphasis on practical training and require students to score 80 percent in all practical examinations. The approach did not work due to lack of enough facilities such as materials, personnel, tools and equipment for practical examination. Therefore, the approach has been changed to Competence Based Assessment (CBA) which focuses on the written examination.

During data collection, the researcher happened to meet a certain owner of a small scale enterprise who had studied in Kenya Vocational Training. This entrepreneur was making vibrator block making machines, mixer block machines, interlocking machines and vibrator pavement block making machines. This was an indication of high level of innovation caused by strong practical innovative skills and knowledge. Therefore, an interview was conducted to investigate how training was being conducted in Kenya Vocational Training. The following was his response:

> *When you enter Kenya Vocational Training you first register. Later on, instructor takes you in three fields, namely, Electricity, Welding and Fabrication and Tailoring. Then, instructors diagnose where you perform better and then they take you in the field where you have demonstrated a good performance. After that, you take the course for two years*

On the part of training, he said*:*

> *There is sufficient training equipment to the extent that each student has one cupboard for the tools, enough workshops. More practical is emphasized*

In so far after training, he said;

> When *I finished the training, I immediately came to Tanzania and established this enterprise without being employed any where and it is five years now*

Therefore, this indicates that, for any vocational training to be effective in imparting skills and knowledge, there must be enough training equipment, student should be trained according to their talents and an emphasis has to be made on the practical knowledge. Also, curriculum has to be well planned in a way that it helps the learner to acquire practical knowledge.

Therefore, it was revealed that the model suggested by Bell and Pivitt' (1993) that entrepreneurs with a fixed set of technological capabilities might adapt, modify and even introduce new machines and products was not being actualized to those who received technological capabilities from VETA. This is because technological capabilities in VETA are built around theoretical backgrounds which failed to equip trainees with practical innovative skills and knowledge.

4.5 Marketing Strategies among Entrepreneurs

This section examines the various marketing strategies used in selling innovated products among VETA, apprenticeship and VETA and Non-VETA entrepreneurs. The

aim was to find out how the marketing skills obtained from VETA are helping entrepreneurs to demonstrate various marketing strategies for selling their products.

Table 11. Marketing strategies among the entrepreneurs

No	Strategies	VETA entrepreneurs (N=20)	Apprenticeship and VET entrepreneurs (N=20)	Non-VETA entrepreneurs (N=20)
1	Exhibition	1 (5%)	6 (30%)	5(25%)
2	Advertisement	3 (15%)	4 (20%)	6 (30%)
3	No strategy	15 (80%)	10 (50%)	9 (45%)

Source: Survey data, 2011.

4.5.1 VETA Entrepreneurs

The study assessed the strategies used by VETA entrepreneurs to sell their products. It was found that 1 (5%) entrepreneur had participated in the National Exhibitions to sell their products. 3 (15%) had used advertisements such as business cards, the internet, brochures and radio, 15 (80%) had never used any marketing strategy for their products. This revealed that there were low market innovative activities caused by lack of marketing skills among entrepreneurs who trained by VETA.

4.5.2 Apprenticeship and VETA Entrepreneurs

The strategies used by entrepreneurs with apprenticeship and VETA to promote their products were assessed. It was noted that 6 (30%) entrepreneurs participated in the National Exhibitions to sell their products. 4 (20%) used advertisements such as business cards, the internet, brochures and radio to sell their products. 10 (50%) never used any

strategy to market their products. This implies that 50 percent were using marketing strategies to market their products.

4.5.3 Non-VETA Entrepreneurs

This study explored on the strategies used by Non-VETA entrepreneurs to sell their products. It was found that 5 (25%) entrepreneurs had participated in the National Product Exhibitions to market the products, 6 (30%) used advertisements such as business cards; the internet, brochures and radio to sell their products, 9 (45%) never used any strategy. Thus 55 percent were using marketing strategies to market their introduced products as an indication of innovative activities.

The study established that 55 percent Non-VETA entrepreneurs were using marketing strategies to sell their products followed by entrepreneurs with apprenticeship and VETA (50 percent) and (VETA 20 percent). The study found that VETA entrepreneurs were more aware of the marketing strategies than VETA entrepreneurs.

The study showed that entrepreneurs were participating in the Exhibitions like the Dar es Salaam International Trade Fair. During exhibitions, entrepreneurs displayed their products to people and provided explanation on how the products were being made or functioned. Some clients were attracted to buy the products while others took entrepreneur's contacts especially mobile numbers for future communication. This strategy had some added value, hence an indication of innovative activities among

entrepreneurs. However, this strategy was more adopted by Non-VETA entrepreneurs than VETA entrepreneurs.

This study showed that entrepreneurs relied on the advertisement strategies to market their products. These included the use of business cards, radio, magazines, brochures, TV and firm websites. Among these, business cards were found to be more popular among the entrepreneurs. The rest were found to be expensive to implement, like firm the websites. In the sample, only one Non-VETA entrepreneur had the website. Generally, it was found that the marketing strategies adopted were effective in connecting entrepreneurs to external customers. For example, it was revealed that through these marketing strategies, entrepreneurs sold their products in Mombassa, Rwanda and Burundi. Therefore, the use of these strategies was an indication of innovative activities among the entrepreneurs. However, the rate of use by the VETA entrepreneurs was low compared to Non-VETA entrepreneurs

Again, findings revealed that there is negative correlation between owner's education and experience in market innovation. This is because VETA entrepreneurs were found to have more experience in metal working but they had less market innovation relative to Non-VETA entrepreneurs. Also, findings revealed that there was negative relation between age of the enterprise and market innovation. VETA enterprises were found to be old with (more than ten years) while Non-VETA enterprises were relatively young (less than ten years). Older firms represent market knowledge and developed networks, hence were more likely to be involved in market innovation activities. However,

findings revealed that Non-VETA enterprises were young but with more market innovations.

It was found that VETA entrepreneurs failed to demonstrate more marketing strategies due to lack of enough marketing skills and innovated products. Innovation of more products is crucial for opening new the markets. Findings by Ibeh (2004) shows that more innovation influences access to more customers. In addition, Becheikh *et al*. (2006) pointed that technological innovation was unavoidable for enterprises which want to develop and maintain a competitive advantage and/or gain entry in to the new markets. It was entrepreneurs who engaged in creativity and experimentation through introduction of new products that are more likely to gain more markets by using different strategies.

The marketing strategies used by VETA entrepreneurs were local, and did not correspondent with the present day marketing technology. Most of them were using the word-of- mouth. Respondents said that the marketing strategies are rather expensive. Some stated that they had failed to establish the marketing strategy because they were too demanding in terms of money and skills, although they were important for creating new customers.

Given this findings, the impact of vocational training on positive outcomes was not realized since the marketing skills were lacking among their trainees. The marketing skills as networking, advertisement in the radio, use of business card and trade fair were

important success in getting the new customers to Non-VETA entrepreneurs. Therefore, it can be argued that graduates at VETA are not prepared to start and develop small enterprises, as the curricular produce graduates with low business skills and knowledge.

4.6 Constrains to Innovation among Entrepreneurs

This section focuses on small enterprises innovation constraints. It was found that there were similar constraints for innovation to all entrepreneurs of metal working enterprises. Such difficulties are caused by lack of expertise, lack of access to finance, lack of ideas for innovation and lack of customer's responsiveness to innovated products.

Table 12: Constraints to Innovation among Entrepreneurs

No	Constraints	VETA entrepreneurs (N=20)	VETA and Apprenticeship entrepreneurs (N=20)	Non-VETA entrepreneurs (N=20)
1	Lack of expertise	4 (20%)	1 (5%)	2 (10%)
2	Lack of finance	10 (50%)	10 (50%)	10 (50%)
3	Lack of Ideas	1 (5%)	2 (10%)	2 (10%)
4	Lack of customers	5 (25%)	7 (37%)	6 (30%)

Source: Survey data, 2011.

Data showed that VETA entrepreneurs, 10 (50%) respondents said that most serious problem that hindered innovation in their small enterprises was lack of financial access. Others were lack of customers 5 (25%), sources of ideas 1(5%) and lack of expertise 4 (20%). This means that inaccessibility to finance was the main factor that hindered innovation.

On the other hand, 10 (50%) entrepreneurs with apprenticeship and VETA said that the most serious problem that hindered innovation in their small enterprises was lack of financial access. Others constraints were lack of customers 7 (35%), lack of sources of ideaas for innovation 2 (10%) and lack of expertise 1 (5%). This implies that inaccessibility to finance was the main factor that hindered innovation.

It was found that Non-VETA entrepreneurs who lacked access to finance were 10 (50%). Those who lacked customers were 6 (30%). Those who lacked sources of ides for innovation were 2 (10%) and lack of expertise 2 (10%). This implied that lack of access to finance was the main factor that hindered innovation. It was observed that entrepreneurs had no enough money to employ other skilled staffs. As a result, in the enterprise, the owner was the main technician assisted by few employees. Also some entrepreneurs lacked money with which to buy business areas such as plots and lands for their work. Consequently, some of them had to rent small areas alongside street and roads while other worked anywhere, as where there was tree shed. Respondents argued that raw materials and advanced equipment were so expensive that entrepreneurs could not buy them. To support this observation, one respondent was quoted saying;

> *Listen my dear friend; innovation is about capital. If you don't have access ability to capital, you can't think about introducing the new products. This is because money will buy quality materials, advanced equipment for production and employing the skilled staffs. Also, I don't have money to buy a generator which would help me in doing my activities, for there is a constant power shortage*

It is suggested from the quotation that lack of access to finance threatened innovativeness of small scale entrepreneurs. As a result, most of the entrepreneurs could not compete with the imported products which have dominated the market. The imported product had larger market shares because they were available, cheaper and attractive to customers. The results show that access ability to finance is important for innovation as it help entrepreneurs to buy advanced equipment that would be able to produce quality goods to customers.

Moreover, the study revealed that lack of customers to innovated products was the second problem. Respondent reported that lack of customers discouraged entrepreneurs from designing new products. Respondents said that customers preferred imported products to the locally made. The fact was that imported products were more attractive than those which were made locally. The advanced technologies involved in imported products provided them with good shape and finish over the locally made ones. Therefore, customers considered the locally made products as of poor quality and made of low technology. This situation of buying imported goods by many people assuming that they were better than those produced locally was a threat to the local entrepreneurs.

The study results showed that availability customers stimulated entrepreneurs to design more new products. This was because customers were the drivers for innovativeness among small enterprises. The more the customers, the more is the degree of innovativeness and vice-versa. However, this problem was not clearly explained by

entrepreneurs because, during the assessment of the marketing strategies, it was found that some entrepreneurs lacked the market strategies for winning customers. But here, it was stressed that imported goods hindered them from getting customers for their products.

The lack of expertise was another factor that hindered innovation in their small scale enterprises. The study found that production techniques were local among entrepreneurs with limited technical expertise. Lack of sources of ideas for innovation was among the factor that hindered innovation. It was revealed that entrepreneurs lacked idea about input, markets and appropriate technology that could develop their expertise. However, this factor was least mentioned.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the study findings, conclusion and recommendations.

5.2 Summary

The specific objective one examined the innovativeness of entrepreneurs who had undergone VETA training against those who had not. By making comparisons, the study has revealed that VETA entrepreneurs are less innovative while Non-VETA entrepreneurs are more innovative.

The specific objective two assessed the marketing strategies used by VETA entrepreneurs against Non-VETA entrepreneurs. The study found that VETA entrepreneurs were less innovative in marketing strategies while Non-VETA were more innovative using different marketing strategies such as business card, the internet, advertisement in the radio and exhibitions.

The specific objective three explored constraints to innovation facing entrepreneurs among small scale enterprises. The study found that entrepreneurs were all experiencing four types of problems as presented below.

(i) Lack of access to financial services;

(ii) Lack of customers for innovated products;

(iii) Lack of sources for ideas for innovation, and

(iv) Lack of expertise

5.3 Overall Conclusion

This study has found that:

VETA has low ability in promoting technological innovation among small scale enterprises in Dar es Salaam. This is evidenced by findings which have revealed that entrepreneurs who have acquired skills through VETA are less innovative in adopting new products and even in making some modifications of the existing technology compared to Non-VETA entrepreneurs. The interviews conducted to entrepreneurs who had acquired skills through VETA showed that courses at VETA are too theoretical. It has also been noted that workshops at VETA are ill-equipped in terms of equipment, personnel and operational funds, and therefore, unable to discharge their mandated responsibilities.

Entrepreneurs with apprenticeship who later join VETA under normal circumstances are expected to be innovative than Non-VETA because they have both theory and practice. However, the study showed that they are less innovative than Non-VETA entrepreneurs. It has been observed when entrepreneurs joined VETA for two years Non-VETA entrepreneurs were making more new products in terms of adopting and making some modifications.

The study has further showed that Market innovation is lacking among VETA entrepreneurs. For example, entrepreneurs who have acquired skills through VETA have low marketing skills. Thus, importance of business education acquired from VETA is not appreciated.

Lack of financial accessibility, customers, ideas and expertise are the factors that hinder innovation in small scale enterprises. Among these factors, lack of access to finance is the most serious problem. During the interview with the entrepreneurs, it was revealed that formal banks considered them expensive to be served; as a result entrepreneurs depend on the informal networks such as relatives and friends.

5.4 Recommendations

Recommendation for practice, policy and academic purposes are offered in light of the findings of this study. To entrepreneurs of small scale enterprises, the following recommendations are provided:

I. The small scale entrepreneurs who are keen on accessing new markets can enhance their innovativeness.
II. The small scale entrepreneurs who want to open up new markets in other areas have to understand the strategies of entry into the new markets.

To policy makers, the following recommendations are made:

I. Regular teaching staffs training are required in order to master the new and changing technology.

II. Modernization of workshops/ training facilities periodically and replacement of older training equipment and tools with new ones are required

III. Since the field training for students is one month, a policy strategy that focuses on increasing the time for field training is essential.

IV. Involvement of instructors in changing the curriculum or any matter concern the curriculum and emphasis on practical skills need to be looked into.

V. The study has established that in VETA, students take many subjects. The number of subjects has to be reduced and an emphasis be put on the student's specialization. Also, students have to be enrolled according to available facilities rather than enrolling many students who could not fit the available facilities.

VI. The policy strategies that help entrepreneurs to open up new market are recommended, for example, the mass media campaigns, business card, brochures, firm website and trade exhibition can be useful.

VII. Financial institutions need to expand their corporate social responsibilities to small scale enterprises.

5.5 Areas for Further Research

From the standpoint of academic scholarship, two particular lessons stand out from the study as basis for further research.

I. Scholars are advised to continue examining the role of vocational training in promoting technological innovation among small scale enterprises in Tanzania. Further areas of focus need to sharpen the theoretical understanding factors which hinder vocational training in making technology transfer.

II. The need for similar research to be replicated to other regions; and other sectors.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR ASSESSING ENTREPRENEURS OF METAL WORKING ENTERPRISES

Section A. Profile of the Enterprise

1. (A) Name of the enterprise…… Date……..……..

(b) Address (c) City…….Location……

(d)Age of the enterprise…….

2. Ownership

( ) Sole proprietors ( ) Joint Venture ( ) Registered company

3. Years of working experience

( ) 1-5 ( ) 6-10 ( ) 11 and above

4. Number of workers working in the enterprise

( ) 1-5 ( ) 6-10 ( ) 11-20

5. Education level of the owner

( ) Primary

( ) Secondary

( ) High Education

Section B. Vocational Training

6. Did you attend any kind of training?

( ) Yes

( ) No

7. If yes to the 6 above; what kind training?

( ) VETA

( ) Apprenticeship

8. Did you work first and later join VETA or you join VETA direct

( ) Work first

( ) Join VETA direct

9. If you worked first how does training from VETA help you?

( ) Excellent

( ) Very good

( ) good

( ) Poor

10. If you joined VETA direct after training where did you go?

( ) Direct to establish this firm

( ) Employed somewhere

( ) Engaged in other activities

11. How does training help you?

( ) Excellent

( ) Very good

( ) good

( ) Poor

Section C .Production Processes.

12. What kind of products are you producing?

.....

.....

.....

.....

.....

13. What kind of production equipment is present in the workshop?

……..……

……..……

14. Where are you getting your raw materials?

( ) Within the country

( ) Outside the country

15. Where did you get the capital for the business?

( ) From the family

( ) Financial institution

( ) From friends

16. Mention the qualifications of the people employed

( ) From VETA

( ) Trained by the industry itself

( ) No qualification

Section D. Innovation

17. Have you developed and introduced any product that is new to your enterprise in the past five years?

( ) Yes

( ) No

.

18. If the answer is yes to question 17 above; how many? ……

19. Have you adopted any new products in your enterprise in the past five years?

( ) Yes

( ) No

20. If the answer is yes to question 19 above; how many?

……

21. Have you modified any product in your enterprise for the past five years?

( ) Yes

( ) No

22. If the answer is yes to question 21 above; how many?

…….

22. Have you developed any new production process (process innovation) that is new to your enterprise for the past five years?

( ) Yes

( ) No

23. If the answer is yes to question 22 above; how many?

……..

24. Have you adopted any new production process (process innovation) in your enterprise for the past five years?

( ) Yes

( ) No

25. If the answer is yes to question 24 above; how many?

……

26. Have you improved any production process (process innovation) in your enterprise for the past five years?

( ) Yes

( ) No

27. If the answer is yes to question 26 above; how many?

……

28. What is the source of ides for innovation?

( ) Internal (industrial workers)

( ) External (by other industries, institution)

( ) Suggestion from the customers

Section E. Market Innovation

29. In what areas are you active in selling the improved/new products?

( ) Dar as Salaam

( ) Other regions

( ) Other countries

30. Have you sold your innovated products outside Dar as Salaam?

( ) Yes

( ) No

31. What are your marketing strategies?

( ) Exhibition

( ) Advertisements

( ) No strategy

( ) Other Specify

Section f. Factors Hampering Innovation

32. What factors hampering innovation in your enterprise?

( ) High costs

( ) Lack of access to finance

( ) Innovation is a risk business

( ) It needs long gestation period

( ) Organization rigidities within the enterprise

( ) Lack of qualified personnel

( ) Lack of sources of idea for innovation

( ) Lack of customers responsiveness to innovated products

( ) Environmental factors

32. What advice do you recommend to VETA so that students can get enough knowledge and skills?

……

APPENDIX B

INTERVIEW GUIDE FOR HEADS OF VETA

1) What is the minimum qualification for admission in VETA?

2) How do you conduct your training?

3) Do you have enough instructors?

4) What do you consider the role of Vocational training in Tanzania?

5) Where do trainees go after their training?

6) To what extent is the curriculum effective in technology transfer?

7) Do you have enough teaching facilities?

8) What changes to education system would you recommend so that students may get enough skills and knowledge?

APPENDIX C

INTERVIEW GUIDE FOR THE VETA STUDENTS

1) When did you join this Vocational training?

2) How did you know about VETA?

3) How do you receive the training?

4) Do you have enough instructors?

5) Do you have enough facilities for learning?

6) Are you receiving the training as you expected?

7) Where will you go after training?