

**MERGING THE GAP BETWEEN FORMAL AND INFORMAL TRAINING:
A CASE STUDY OF MOBILE PHONE REPAIRERS IN MOROGORO
MUNICIPALITY, TANZANIA**

*Dissertation Submitted in Partial Fulfillment of the Requirements for the Master's
Degree in Curriculum and Instruction*

By

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EXTENDED ABSTRACT

The development of science and technology has led to the emergence of mobile phone technology which has gained tremendous popularity as the ideal device for communication in modern times. In relation to the emergence of mobile phones, there is the need for a new field of profession which ensures mobile phone repair and maintenance. In response to the need, there have emerged a lot of entrepreneurs across the country offering mobile phone repair and maintenance services. Hence, the study aimed to assess the state of mobile phone repairers' skill development and compare the phone repairers' demands with the coverage of Vocational Education Training Authority (VETA)-Kipawa and Dar es Salaam Institute of Technology (DIT) curricula. The case study design under qualitative approach employed interview, observation and documentary review to gather the data from 15 mobile phone repairers, 20 customers of the repairers and 5 VETA trainers. The findings revealed that most mobile phone repairers joined the industry as a result of both intrinsic and extrinsic motivation. Additionally, the study found that most mobile phone repairers acquired skills through observing experienced mobile phone repairers and short courses organised by VETA. It was discovered that some of the mobile phone repairers lack formal or non-formal trainings relating to mobile phone repair. The researcher reports on the need of the government through training institutions to avail easily accessible and affordable formal and non-formal mobile phone repair trainings. The results also show that the existing curriculum used at VETA to offer trainings to mobile phone repairers does not wholly match their needs. The study based on the findings, it recommends that mobile phone repairers should not only learn informally, especially from more knowledgeable and experienced mobile phone repairers, but also should attend training institutions. It is also recommended that the government should facilitate mobile phone repair training institutions in providing specialized skills relating to mobile phone repair in order to meet the demands of mobile phone repairers.

DECLARATION

I, Joram, Kabelinde do hereby declare to the Senate of Sokoine University of Agriculture that, this dissertation is my own original work done within the period of registration and that it has neither been nor being concurrently submitted in any other institution.

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LIST OF ABBREVIATIONS AND SYMBOLS

DIT	Dar es Salaam Institute of Technology
VETA	Vocational Education Training Authority
TANROAD	Tanzania National Roads Agency
URT	United Republic of Tanzania
TCRA	Tanzania Communication Regulatory Authority
USA	United States of America

CHAPTER ONE: General Introduction

1.1 Background

Development of science and technology has brought about changes and innovations of new technological ways applied by the majority of the people to perform various activities (Douglas, 2015). One of the fast-growing technological developments is mobile phone technology which has become one of the fastest-growing technologies in the world (Mtenzi et al., 2008). The widespread ownership and multifaceted use of mobile phones have necessitated the need for phone maintenance and repair and this has therefore led to the need for professional repairers who can service and repair mobile phones (Msikula, 2016). Despite this need, there is evidence that untrained individuals essentially carry out this work (Nkwi, 2013).

Needless to say, in order for these unskilled phone repairers to work efficiently, curricula related to mobile phone repair and maintenance are required to train them and those interested in this industry to acquire skills relevant to mobile phone repair and maintenance (Douglas, 2015). Pearce et al. (2013) reports that United States of America, Indonesia, China, and Bangladesh have developed curricula for the people engaged in mobile phone repair and service business. Similarly, African Governments have taken initiatives regarding the need to establish mobile phone repair curricula. For example, in Nigeria, Cameroon and Kenya, different stakeholders, including the Commonwealth of Learning Workshop, developed mobile phone repair and maintenance courses to address the need (Pearce, 2013; Houston et al., 2019). Like other African countries, Tanzania through Dar es Salaam Institute of Technology (DIT) and VETA Kipawa, have developed curriculum related to mobile phone repair (URT, 2017; Msikula, 2018). The general secretary of mobile phone repairers in Morogoro Municipality disclosed that there are more than 130 registered mobile phone repairers in Morogoro Municipality.

1.2 Statement of the Problem

In Tanzania, mobile phone technology entered in the early 1990s. Currently, there are six operating mobile phone companies in the country. Such companies include Vodacom, Airtel, TIGO, Zantel, TTCL, and Halotel (Mtenzi et al, 2008). The number of subscribers has increased, reaching 52.9million by March 2021(O'Dea, 2021). The increased use of mobile phones has necessitated the need for the mobile phones repair and maintenance services in Tanzania (URT, 2017). According to URT (2017), mobile phone repair trainings are offered by only two institutions including VETA Kipawa and DIT that are found in Dar es Salaam. VETA Kipawa and DIT have developed curricula to equip local mobile phone repairers with the required skills. This implies that there is scarcity of formal trainings for mobile phone repair service professionals found outside of Dar es Salaam. Because of this problem, mobile phone repair and maintenance service has been widely offered by informally trained repairers. Despite the fact that there are mobile phone repair and maintenance programs in the mentioned technical institutions in Tanzania, it is not known whether, or not: (i) the training package reflects the deed and (ii) the training modality meets the demands and interests of many mobile phone repairers across the country. For example, it is not clear if the mobile phone repairers in the Morogoro municipality acquire the technical skills needed formally from DIT and VETA-Kipawa or informally. Because of the continued evolution of mobile phone versions, we are sure that the mobile phone repairers update their skills in line with the upgrading or existing brands and new developments in the mobile phone technology. What we are lacking are: (i) the information about where and how mobile phone repairers, particularly those outside Dar es Salaam, develop their skills and (ii) whether, or not, the curricula developed in DIT and VETA-Kipawa have addressed the needs of mobile phone repairers in Tanzania. The study intended to fill this gap.

1.3 Justifications of the Study

This study is enormous important and timely due to the fact that information technology is one of the important drive in social and economic development especially in the developing countries like Tanzania. Given the economic level of many Tanzanians, buying new handset every time could not be possible; hence, mobile phone repairing industry is inevitable. In that case, we need people with skills to perform such activities. In addition, this study can help creating self-employment among youths given the rising demands and consumption of information technology.

1.4 General aim and Specific Objectives

1.4.1 Aim

The study aimed to examine the state of mobile phone repairers' skills development and to compare the mobile phones repairers' needs with the existing curricula.

1.4.2 Specific Objectives

Specifically, the study aimed to;

- i) Assess the state of mobile phone repairers' skill development.
- ii) Compare the phone repairers' demands with the coverage of VETA-Kipawa and DIT curricula.

1.5 Research Questions

The study was guided by the following questions:

- i. What motivates people to join mobile phones repair business?
- ii. How do mobile phone repairers acquire the skills they use in their phone repair job?
- iii. How does VETA training package reflect the need and to what extent does the training modality meet the demands and interests of the mobile phone repairers?

1.6 Overview of Theoretical Empirical

1.6.1 Theoretical stance of the study

Different theories guide mobile phone repairers in repairing and maintenance of mobile phones. This study is informed by TRIZ Theory which was proposed by Genrich Altshuller in 1946. The theory explains the causes and problems of mobile phone repair claims. It describes and proposes an improvement strategy for enhancing maintenance and repair of mobile phones (Chang & Wang, 2010). The theory applies four steps to systematic innovation: (a) definition of the problem; (b) selection of tools; (c) generate solutions and (d) evaluate. These are procedures that even mobile phone repairers follow when repairing mobile phones. They also identify the problem, select the tools of solving such problem, generate the solutions and evaluate whether the problem has been eliminated or not. Hence, this theory is more related with the study than any other theory because its procedures are relating with that of mobile phone repair process.

TRIZ theory assumes that people primarily learn procedural tasks by induction and that bugs occur because of biases introduced in the examples provided or the feedback received during practice (as opposed to mistakes in memorizing formulas or instructions). Therefore, the implication of the theory is that problem sets should be chosen to eliminate the bias likely to cause specific bugs.

Therefore, in this study, the theory implies how mobile phone repairers react to challenges when they arise, including how technical institutions try to address the challenges. Moreover, the theory proposes that all procedural tasks should be included in the training relating to mobile phone repair. Going through the repair process applies procedural applications to arrive at the result. Thus, the essence of the theory is that problem should be chosen to eliminate what is likely to cause the bugs and resolve them.

1.6.2 Empirical literature review

1.6.2.1 Acquisition of mobile phone repairing expertise

Acquisition of mobile phone repairing skills vary from one person to another; some repairers acquire their skills formally while others informally. Skills play a vital role in determining the prerequisite for employment, economic stability, income, status, and future work lines among mobile phone repairers in various countries. For example, Ahmed et al., (2015) and Riisgaard et al. (2016) contend that most mobile phone repairers in Bangladesh learn, develop, improve, and update mobile phone repair skills through more knowledgeable and experienced repairers, online programs, and various formally organized training.

The introduction of mobile phone technology in Africa leads to an increase in number of mobile phone repairers who gain mobile phone repair and maintenance skills in different ways (Douglas, 2015). Eze et al. (2017) argue that mobile phone repairers group mobile phone faults into software, hardware, and setting faults. Therefore, competent and skilled repairers are needed to address these faults. In Nigeria Chikwuendo & Nwachukwa (2014), Kenya Douglas (2015) and Msikula (2016) report that mobile phone repairers gain mobile phone repair skills through both formal and informal ways. In Uganda Huston et al., (2019) explains that mobile phone repairers rely on online networks and programs to develop and update phone repair and servicing skills. Bojczuk (2019) argues that mobile phone repairers in Kariakoo Streets of Dar es Salaam acquire skills relating to mobile phone repair through more knowledgeable repairers. Msikula (2016) says that IT graduates from various institutions like DIT and VETA Kipawa train many mobile phone repairers operating in different streets, including the Kariakoo Streets. However, there is lack of information on how mobile phone repairers in Morogoro municipality acquired mobile phone repairing skills. Hence, this study intended to examine the state of mobile phone repairers in skills development in Morogoro municipality.

1.6.2.2 Curriculum in Mobile Phone Repair

Mobile phone repair curricula vary from one country to another. These variations depend on the need of the mobile phone repairers. In USA, China and Bangladesh people have established individual curricula for mobile phone repair training (Ahmed *et al.*, 2015). The established courses take a long and short time at a local mobile phone repair Centre and apprenticeship respectively. On the contrary, mobile phone repair curricula in Nigeria have been introduced in the technical colleges to provide the required skills for the repair and maintenance of mobile phones (Chikwuendo & Nwachukwu, 2014). Distance learning courses for mobile phone repair have been introduced individually in Kenya to target people who would like to start and run mobile phone repair services (Pearce, 2013; Douglas, 2015).

In Tanzania, Tanzania Communication Regulatory Authority (TCRA) in collaboration with the DIT and VETA Kipawa developed mobile phone repair courses to facilitate certification for the provision of the electronic equipment repair licence to the practising mobile phone repairers (URT, 2017).

Therefore, most of the curricula provided by different countries have relatively common objectives: disassemble and assemble mobile phones, identify their faults, and repair them. The literature, however, lacks information on how to merge the formal and informal training to improve mobile phone repairers' skills.

1.7 General Methodology

This study took place in Morogoro Municipality. This area was chosen because it is one of the municipal councils with many mobile phone repairers but without any institution that offers mobile phone repair and maintenance training programs. The qualitative research

approach was applied in gathering the data. The single-embedded case study design was employed to get in-depth information on the problem under study. The study used snowball and purposive sampling techniques to sample out 40 participants from the target population which included mobile phone repairers, their customers and VETA trainers. Snowball sampling method was used to sample mobile phone repairers and their customers because the researcher had no prior information about the participants. The researcher contacted one mobile phone repairer who directed him to the other mobile phone repairers and their customers. Purposive sampling method was used to select VETA trainers who train mobile phone repairers with the help from management. This is due to the fact that trainers have reliable information useful for the study. The researcher used interviews with participants including; VETA trainers, mobile phone repairers and customers. Interviews was used to collect data concerning with what motivated the mobile phone repairers to join the field, how do they acquired mobile phone repair skills and challenges they face in repairing mobile phones. Interview with customers intended to collect data relating to the service they get from mobile phone repairers. In addition, interview conducted with VETA trainers provided information relating to training programs and challenges facing training programs. Documents including VETA curriculum were reviewed to compare courses provided by VETA with demands of the mobile phone repairers. The study used observation to observe procedures followed in diagnosing faults, tools used to repair mobile phones, customer care and satisfaction of the customers. The data collected were then organised within the premises of the both case study designs employed namely: single and embedded from the participants. Qualitative data collected through interview were analysed through thematic analysis, whereby data were defined, interpreted and grouped into themes and finally the report was produced. Data were then explained further by the sentences quoted directly from the participants.

Thematic analysis preferred because this study was conducted in Morogoro municipality for the first time and the less was known about the problem under investigation.

1.8 Conceptual Framework

The conceptual framework gives a structural framework that shows the study's content. It represents the researcher's literature synthesis and describes the repair and maintenance of mobile phones. In addition, it allows the understanding of how the particular variables connect or relate to each other. Thus, it is the researcher's path to examine the study.

Figure 1.1 presents the study's conceptual framework.

Independent variables

Dependent variable

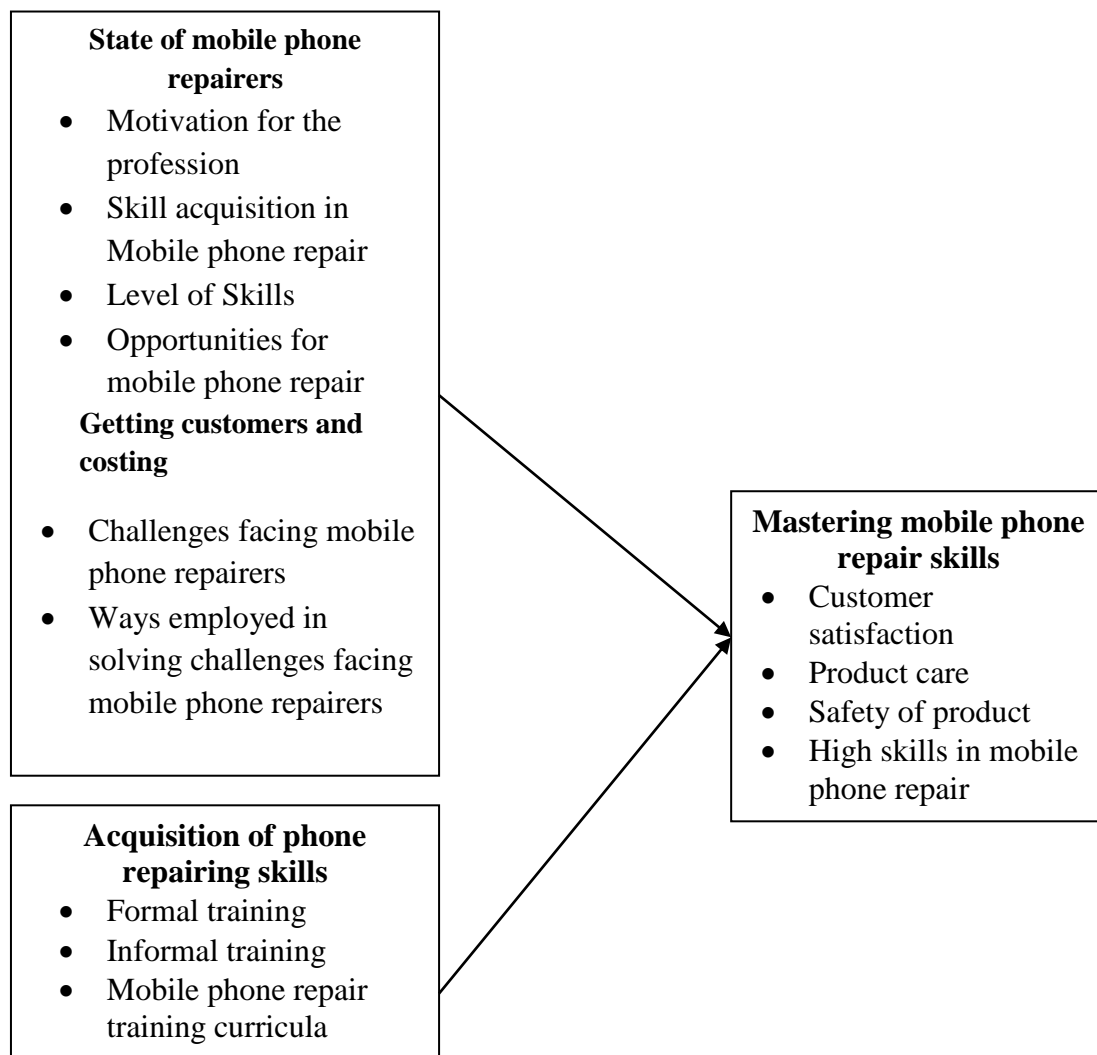


Figure 1.1: Conceptual Framework

Source: Researcher's own construct

1.9 Limitation of the Study

It is important to note that some challenges that researcher faced during data collection did not in any way compromise the findings of the study. Some of the challenges included; Firstly, Research participants were busy serving the customers as they participated in the study. Secondly, the researcher faced challenges in finding the literature relating to the study carried out.

1.10 Outline of the Study

This dissertation is organized into three chapters. The first chapter gives an overview of the background and sets the scene of the study. Chapter two comprises of papers as distinguished in research questions. Chapter three describes general discussion and practical implications, conclusion and recommendations.

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CHAPTER TWO: Paper One

2.0 Study and analysis of Skill level of mobile phone repairers in Morogoro City of Tanzania

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Abstract

The study investigated the practices of mobile phone repairers in repairing mobile phones. Data was collected through interviews and observation from 15 mobile phone repairers in Morogoro municipality and was analysed qualitatively using thematic analysis techniques. The findings revealed that mobile phone repairers engage in the mobile phone repair business because of various factors. Most mobile phone repairers join the mobile phone industry because of income and employment problems. It was noted further that, about 75% of phone repairers acquired the related skills informally while 25% of them had this skills in formal ways. Therefore, it is recommended that mobile phone repairers should not depend only on learning from more knowledgeable and experienced mobile phone repairers but also should attend training institutions such as Vocational Education Training Authority and Dar es Salaam Institute of Technology.

Keywords: Tanzania, mobile phone repairers, skill development.

2.1 Introduction

Businesses and industries all over the world are beginning to value skills over mere mastery of theoretical skills (Pearce, 2013). This is why many more people have decided to employ themselves in various businesses that can help them run their lives (Baptiste et al., 2019). This scenario has found expression in mobile phone industry. The unprecedented growth of the mobile phone industry is hardly a secret. In modern world, people are not able to live without their phones, for these have become one of the most crucial things in a person's life (Douglas, 2015). The customer base for the mobile phone industry has risen significantly, giving rise to many job opportunities (Manner, 2018).

The unprecedented growth of mobile phones has given rise to many job opportunities (Manner, 2018). Mobile phones, like all gadgets are subject to breakages. Most people have experienced a broken phone at some point (Manner, 2018). Daily, we come across people looking for places and experts to repair their mobile phones (O'Dea, 2021). Many phone users who are not tech savvy require help even for the smallest problems (Chang & Wang, 2010). That is to say, the introduction of mobile phone technology has compelled the need and opportunities for people to engage in the job of repairing mobile phones. Generally, with the mobile phone industry growth, there appeared a rapid growth in the mobile phone repair industry, with small repair shops popping up every day (Nkwi, 2013).

According to Douglas (2015) in the developed world, the mobile phone repairing service has been strictly offered by trained and certified personnel. The situation, however, is different in developing countries. The rapid spread of mobile phone technology had led to the rise of local and untrained mobile-phone repairers. The untrained mobile-phone repairers carry out activities in urban and rural areas.

While consumer expectation for quality repair service has become higher local repairers face technological challenges (Chang & Wang, 2010). Versatile brands, multi-functions, and various interface specifications have made mobile phones more complicated to repair (Chukwuedo & Nwachukwu, 2014). Faced with the booming creation of new mobile phone models, repair personnel must regularly update service engineering technology (GSMA, 2016). For these people to work more efficiently there appears a need to provide local mobile phone repairers with specialist training. Like the rest of the world, mobile phone ownership has increased significantly in Tanzania since the 1990s (Mtenzi et al., 2008). This widespread ownership of mobile phones has subsequently prompted an increase in the number of untrained mobile phone repairers (Douglas, 2015; O'Dea, 2021). However, there has been relatively little investigation of what motivates them to become mobile phone repairers. In addition, empirical evidence remains scarce on how these repairers acquired such mobile phone repairing skills, hence the goal of this paper.

2.2 Method

The study employed a qualitative research approach to get in-depth information. This approach enabled the researcher to develop details about the individual or place and be highly involved in the participants' actual experiences (Creswell, 2012). The data was organized within the premises of the single case study design involving only mobile phone repairers. This case study involved 15 mobile phone repairers with different experiences and levels of education who were selected using the snowball sampling technique. The study found nine participants had experience of more than five years in the mobile phone repair industry while six respondents had fewer than five years' experience in the field. The raw data gathered through interviews were organized into manageable units. These units included data relating to what motivated mobile phone repairers to learn about mobile phone accessories and how they acquired their skills. Thematic analysis was used to analyse qualitative data collected through interviews.

2.3 The state of Mobile Phone Repairers' (Technicians') Skills In Morogoro in Tanzania

This section analyses factors that motivate individuals into becoming mobile phone repairers, how they acquire related skills, business opportunities (for mobile phone repair), challenges facing mobile phone repairers, and customer satisfaction.

2.3.1 Motivation for the profession

The study was interested in establishing what motivates phone repairers to join this profession. The most prevalent reasons were easily available income and employment opportunities, encouragement, prestige, and seizing (grabbing) an opportunity.

2.3.1.1 Income and employment problems

The results indicated that mobile phone repairers became interested in mobile phone repair activities because of easily available income and employment problems. This inference was authenticated by interviewed participants. For example, participant B with experience of ten years in repairing mobile phones disclosed, *"You know this enterprise has a lot of money; it pays a lot if you are competent and committed to it; this is what made me join the field"*.

Another participant D with experience of five years echoed the same sentiments:

"I developed an interest in mobile phone repair because it was the only remaining solution to overcome employment problems and I wanted to earn money to run my life".

The above statements indicate that due to the need to earn a living and there being unemployment issues, there was no way except resorting to learning mobile phone repair so that it could later be the solution for employment scarcity and a source of income. The results echoed Baptiste et al. (2019) observation that phone repairing has a crucial role in kick-starting and motivating grassroots innovations. Now, there is a binding belief that digital technologies can spur economic growth in the world's youngest continent.

The study noted further that some mobile phone repairers join the career because they saw the opportunity associated with it. It was found that phone repairing services had increased due to the increase in mobile phones compared to computers and other electronic accessories. For example, participant G commented, *"I developed an interest in mobile phone repair because I found a mobile phone with many users than a computer"*.

The development of technology with modern mobile phones made the repairers spend a lot of time on online programs to improve their skills in order to cope with the changing technology and to be updated to handle the latest versions of mobile phones. Participant M stated, *"I spent much time learning online programs to repair new mobile phone versions like TECNO, Itel, and Infinix"*. This concurred with Mtenzi et al. (2008) who stated that some repairers join the career because they see the opportunity associated with them. Likewise, Hauston (2019) argues that mobile phone repairers spend much time on different online programs to get the required skills to repair and service modern mobile phones because they see opportunities associated with the phone repair business.

2.3.1.2 Encouragement from Schools and friends

Six out of 15 mobile phone repairers developed an interest in mobile phone repair because they were encouraged by their peers. For example, participant D was encouraged by his former trainer to venture into this career. As he said; *"I developed an interest in mobile phone repair because the more knowledgeable and experienced repairer who taught me was humble and advised me to learn mobile phone repair for future life"*.

These results supported Msikula (2016) and Turkeli, et al. (2019) who concludes that some people opt for a career in this industry because they were recommended by either their friends or family or encouraged by their teachers in school.

2.3.1.3 Pride and Prestige

The study further revealed that some repairers joined the careers because of the success story they had either read or seen from a successful mobile phone repairer. These repairers had a desire of becoming famous and economically endowed just like their role models. Thus, they opted to learn phone repairing, hoping they would succeed and fulfil their desire. For example, participant E disclosed; *"My interest was to become an expert famous in mobile phone repair. However, getting money was not my main agenda for engaging in mobile phone repair"*. This agrees with Kotey et al. (2017) who demonstrate that some people join specific careers because of the pride and prestige associated with the status quo of a specified profession.

2.4 Skill acquisition in Mobile Phone Repair

The study was also interested in establishing how the phone repairers acquired the mobile phone repair know-how. The data collected revealed various forms of skills acquisition which are grouped into formal and informal training.

2.4.1 Formal Training

Some phone repairers did not undergo any formal training in phone repair; they had got prior training in either Information Technology (IT) or science-based technology courses. Through an interview with mobile phone repairers, it was disclosed that mobile phone repairers had some skills about IT. Thus, they used such skills to learn how to repair mobile phones. The repairers argued that the IT software program uses the same system as mobile phones. This meant that the system of software in a computer was the same as the software system in mobile phones. However, the IT skills were supplemented with practical learning from the more knowledgeable repairers. For example, participant G, one of the IT graduates and a mid-experienced mobile phone repairer, narrated, *"Mobile phone system is as the same as any IT system, so it is easy to apply skills of IT program to mobile phone repair"*.

The findings align with Msikula's (2016) observation that IT graduates from various institutions apply the acquired IT skills to provide mobile phone repair and maintenance services in different streets, including Kariakoo streets.

Furthermore, the study noted the existence of online training programs; in which other repairers had to attend, largely due to their hobbies and interests in mobile phone repair since childhood. However, it was noted that the repairers initially were not into building careers in mobile phone repair; instead, they were interested in the mobile phone software and IT. Later, they also became interested in repair based on the encouragement from people around them. As a result, they began learning how to repair phones' speakers, touch screens, mikes, glass protectors, IC, charging systems, and motherboards. One of the more experienced mobile phone repairers, participant M, disclosed, "*My interest was learning online programs related on how mobile phones are made and repaired*". The above argument aligns with Huston (2019) who asserts that local mobile phone repairers rely upon different online networks to get the required skills to repair and service mobile phones. Therefore, it is also important in the globalized world to use the internet to learn how to repair mobile phones because online programs have rich sources of materials.

2.4.2 Informal Training

The study found that the majority of the repairers got the skills either by learning from more experienced repairers or through trial and error. For example, during the interviews, it was revealed that 9 out of 15 interviewed mobile phone repairers acquired skills from the more knowledgeable and experienced mobile phone repairers. Repairers revealed that they obtained those skills by observing the more skilled mobile phone repairers. In addition, they received these skills by first assisting the more knowledgeable and experienced mobile phone repairers in their daily work. Two mobile phone repairers exemplify this approach to learning. The first one was participant A, who stated,

"I started helping people to do some little things such as connecting phones to the internet, downloading and installing some programs on the phones, doing mobile phone settings, charging phones and batteries and changing housing, mike, speaker, covers or screen protectors". (A, 2022).

The findings align with Ahmed et al., (2015), who disclosed that the mobile phone repair learner should intensively observe experienced mobile phone repairers. While observations do not necessarily lead to successful learning, Ahmed argues that they help someone remember what and how the knowledgeable and experienced repairer is doing.

The other informal means of learning was through trial and error/ practical activity. The study found that some mobile phone repairers learned and acquired skills relating to mobile phone repair through practical training. They started as assistants through trial and error and then developed basic skills to fix simple mobile phone hardware, such as connecting phones to the internet, setting the phones, replacing phone-housings, and repairing screen protectors. This is testified by participant D, one of the experienced mobile phone repairers, who articulated,

"I started helping the more experienced phone repairer do some things practically, such as glass replacement, system charge replacement, battery terminal replacement, mike, and speaker replacement, touch replacement, a plate of system charge replacement, and changing housing fixing protector". (D, 2022).

This finding aligns with Ahmed's *et al.* (2015) argument that some repairers have their stalls or roadside shops that connect phones to the internet, change housing, fix protectors, and others operate alongside other repair operations in large informal markets. It also aligns with Baptiste *et al.* (2019) who assert that young repairers learned welding techniques practically from a more experienced person known as an engineer. Learning through practical activity makes the learning effective because it allows full participation of the senses, hence, effortless mastery of the skill.

2.5 Level of Skills

The researcher was also interested in gaining understanding of how the repairers gauge themselves. Therefore, the level of mastery was categorized according to their experiences and education level. The study found that nine out of fifteen mobile phone repairers had experience of less than five years in repairing mobile phone while six out of fifteen had experience of more than five years in the industry.

As per the Tanzania system, education categorization includes primary, secondary, technical, and tertiary education. The findings of education levels have been presented in table 1.

Table 2.1: Education levels

Education level	Number of participants
Primary	3
O- Level	9
A-Level	1
Technical	1
Tertiary	1

Source: Field Data (2022)

The findings indicate that the majority of the phone repairers had low level of education, most of whom have ordinary level education. Also large number of phone repairers had the experience of less than five years in repairing mobile phones.

2.6 Opportunities for Mobile Phone Repair

Through the interview with mobile phone repairers, the research findings revealed that skills of mobile phone repair had created various opportunities for mobile phone repairers. 10 out of 15 mobile phone repairers were able to expand their social network, which means the participant could create friends and increase their social network with customers. The social network thus was used for advertising and widening the scope of their work, and growing many customers. Participant E, one of the more experienced mobile phone repairers, revealed, *“Through repairing the mobile phones, I create many*

friends who help me solve various life problems and increase the social network of my other businesses”.

Through the interview, the findings revealed that mobile phone repairers used transferable phone repair skills to get self-employment and as a source of income. For example, participant A with experience of four years in repairing mobile phones, disclosed, *“I have employed myself since I obtained these skills. I receive between TSH 150 000/= and TSH 200,000/= per month, which enables me run my daily life”.*

In addition, through interviews with mobile phone repairers, the research findings indicate that the amount of income mobile phone repairers obtained per month varied from one repairer to another and depended on how one repairer received the customers. For example, mobile phone repairers with high income range from TSH 500000/= to TSH 650000/= a month, whereas those with low income range from TSH 150000/= to TSH 200000/= per month.

The research findings obtained from interviews with mobile phone repairers revealed that mobile phone repairing skills enabled the repairer to receive income, which helped them pay school fees for their children and house rent.

2.7 Getting Customers and Costing

Under this skill, the data generated was how the repairers get and maintain customers. It was revealed from the interview that phone repairers obtained customers through a chain referral style. As a result, customers who are satisfied with the quality of services provided by the repairers recommend other customers and colleagues, which helped bring more customers to their workshops. For example, participant G, one of the experienced mobile phone repairers, disclosed, *“I get customers through customers who become satisfied with the quality of service I provide them. Other means include use of WhatsApp groups, Instagram, Facebook, advertisements in what the repairers commonly marked with Swahili words FUNDI SIMU’ and advertisements in front of the office.”* (G, 2022).

The arguments align with Baptiste et al. (2019) who argue that mobile phone repairers get customers through advertisements.

Furthermore, it was noted some repairers get customers through mobile phone shops. Shops offer different information on services to their clients, including where to repair phones when they get at fault.

Also, some phone repairers, who are along the path, get customers from the passers-by. For example, participant J revealed, *“I get customers who pass nearby my table marked with Swahili words ‘Fundi simu’”*.

Findings further revealed that several criteria are required to set the prices for phone repairing services. These criteria depend on the nature of faults, kinds of phones, approach or appearance of the customer, and repair time. Baptiste et al. (2019) argue that mobile phone repairs do not have permanent costs for particular services; it is common for mobile phone repairers to negotiate with their customers on repair and service costs.

The nature of faults. The interview revealed that most mobile phone repairers charge customers depending on the nature and extent of defects. For example, participant I, one of the experienced mobile phone repairers and mobile phone seller, disclosed;

“The amount required repairing Android phones such as Infinix, Samsung, Tecno, ITEL, Vivo, and Nokia, with different faults vary. The faults include broken LCD, touch screen, memory IC, Power IC, charging control IC, microphones, speakers, network, flashing, and unlocking, repairing, and reading passwords. The amount required to fix the same faults in mobile phones like iPhones and tablets is different” (I, 2022).

Kind of phones. Both interviews and observation revealed that the type the nature of the problem of the mobile phone determined the amount to pay for repair service. The mobile phone repairers disclosed that the kind of mobile phone was used to determine the repair cost. The most expensive mobile phones like the iPhone, Samsung, and iPad are also

costly to repair. participant L, with experience of three years in repairing iPhone mobile phones, disclosed, *“It is costly to repair iPhone because it needs more advanced technology and tools compared to android phones”*.

The appearance of the customers. The mobile phone repairers categorize customers by their appearance. Observation revealed that customers were charged differently for the same fault or service. A customer who seemed to be less informed on phone spare parts is given a high cost to pay. A customer who appears to be aware and conscious of the spare parts was charged a reasonable amount of money. For example, some customers were charged TSH 5000/= for changing glass protectors while others charged TSH 3000/= for the same service. Participants C, one of the experienced mobile phone repairers with ten years of repairing mobile phones disclosed,

“Charging the customers depends on their awareness of spare parts. If they seem ignorant of the phone spare parts, they will be charged a high amount of money because they cannot question. If they seem to be aware of the costs of the spare parts, they will be charged a reasonable amount of money” (C, 2022).

Repair Time. The repairers evaluate the extent of damage and the time needed to repair it. It was revealed that the damages that required more time were highly charged than the damages that took a short time to fix. For example, participant K asserted, *“If I spend much time repairing a specific mobile phone, the charge of service to the customer will be high”*.

2.8 Challenges Facing Mobile Phone Repairers

Through interviews and observations held with mobile phone repairers, research findings revealed several challenges that the mobile phone repair cadre faced in dealing with mobile phone repair.

2.8.1 Lack of office space

Through interviews and observation of mobile phone repairers research findings indicated that 08 of 15 mobile phone repairers do not have permanent offices. This was because they did not have the capital to hire offices and or buy modern and advanced tools for mobile phone repair. Ultimately, they end up fixing coloured umbrellas with a table beside the highways and pathways. Mobile phone repairers disclosed that the lack of the office space made the customers lose trust in the ability of some mobile phone repairers. Participant B, who has a twelve year experience in repairing mobile phones stated, *“This problem of not owning a permanent office is a limitation in getting trust from the customers”*.

2.8.2 High price of items and Lack of capital

The study established that quality spare parts were very expensive to purchase by both mobile phone repairers and customers. Largely because each kind of mobile phone needs its unique toolbox to fix, which were expensive. In addition, 13 out of 15 interviewed mobile phone repairers had the problem of lack of capital that could help them rent offices, get adequate, effective, and modern tools. Furthermore, they failed to attend pieces of training because of lack of capital. Participant G, with an experience of five years in mobile phones repair, indicated; *“The money I earn is only enough for paying house rent, school fees for my children, buying food and maintaining my day to day life”*. Moreover, participant H with seventeen years of mobile phones repair disclosed;

“To be well equipped in mobile phone repair activities, one needs to possess all kinds of tool boxes for diagnosing and fixing all kinds of mobile phones but I don’t have enough capital to buy all toolboxes required for fixing every type of mobile phone.” (H, 2022)

2.8.3 Language barrier

Research findings obtained from an interview with mobile phone repairers indicated that 12 out of 15 mobile phone repairers had language problems. It was revealed that 100% of mobile phone parts and accessories were written in English, which was hard to understand by 12 out of 15 mobile phone repairers for they had standard seven and O- level education. Participant B, one of the participants with more than fourteen years in the mobile phone repair industry, disclosed; *“I face difficulties naming mobile phone accessories and spare parts because all are written in a foreign language that I am not competent in”*.

2.8.4 Scarcity of tools

Through interviews with mobile phone repairers, the researchers established that each type and kind of mobile phone needed its toolbox to fix some faults. Unfortunately, some of the equipment required to repair specific mobile phones were hard to find. They were not available unless by particular order from the countries where they were manufactured. So, to overcome the problem, 7 out of 15 mobile phone repairers revealed that some of those items were therefore made locally or taken from another damaged mobile phone but with different faults to meet the customers' needs. For example, participant B, revealed, *“an item like power button for Tecno mobile phone is hard to find in all shops, but there is only one repairer in the whole area that can assemble the item locally”*.

2.9 Ways Employed in Solving Challenges Facing Mobile Phone Repairers

On the other side, the research findings indicated how mobile phone repairers solved their challenges. Research findings obtained through interviews and observation unveiled that those challenges were solved in various ways. These ways included:

2.9.1 Compensating the customers

An interview with mobile phone repairers and customers revealed that 4 out of 15 mobile phone repairers required recompensing the customer's property damaged during the repairing process. Moreover, mobile phone repairers must replace the fake fixed equipment with genuine ones. It was found that sometimes mobile phone repairers decided to compensate their customers with a new phone. Sometimes, mobile phone repairers chose to refund the broken phone with money.

The interview with mobile phone repairers and customers revealed that 5 customers were compensated differently. 1 customer was compensated with a new phone, another one was compensated with money, and the other 3 got replacements with genuine equipment. Participant G one of the experienced mobile phone repairers, revealed, *"I compensated the customer with genuine screen touch when his phone was damaged during the repair process"*.

2.9.2 Cases of corruption

Mobile phone repairers complained of harassment and frequent arrests whenever police officers found them being in illegal possession of mobile phone flashing or unlocking tools. The police officers would seize their properties by force only to release them after paying bribes in form of money. The above statement was evidenced by 7 out of 15 mobile phone repairers. For example, participant E revealed, *"I was caught by a police officer who took my work tools and equipment by force until I bribed him before getting them back"*.

2.9.3 Getting spare parts from colleagues

Due to a lack of spare parts to replace items with faults in some mobile phones, the repairers would contact another repairer to get the required accessory or item. For instance, all kinds of AC systems and power switches for mobile phones or display restart devices. Participant J, one with experience of nineteen years in repairing mobile phones, indicated, *“It’s challenging to find a power switch for restarting mobile phones in any shop, so, when the customer brings phone with such fault, I contact other repairers to get it”*.

2.10 Discussion

There is evidence for both intrinsic and extrinsic motivation to the people engaged in mobile phone repairing. Also, mobile phone repairers are struggling to acquire skills in mobile phone repair through both informal and formal ways.

Intrinsically, some mobile phone repairers were interested in science from schools and are interested with IT issues specifically in mobile phones. Some repairers have studied IT-based issues up to the tertiary level. These are potential customers for any formal program on mobile phone repair from any institution. The above description concurs with Msikula’s (2016) observation that there are many graduates from IT institutions such as IFM, UDSM, and DIT who have opened mobile phone repair shops in different streets like Kariakoo streets where they offer mobile phone repair services and teach the same skills to those interested in mobile phone repair business. In addition, several mobile phone repairers joined the business because they wanted to be famous and feel pride in doing mobile phone repair. The argument concurs with Kotey et al. (2017) who contend that some youths join the mobile phone repair industry because of pride and prestige. Secondly, there is evidence of extrinsic motivation; such as repairers doing repairing because it is an important employment opportunity as Baptiste et al. (2019) and Laitala, et

al. (2021) assert that phone repairing has a crucial role in the economic growth in the world's youngest continent hence increase employment opportunities among mobile phone repairers. All these calls for mobile phone repair at different levels. Such levels include level 1 (deals with basic repair), level 2 (intermediate) and level 3 (advanced) knowledge. Other levels include level 4 (for certificate), levels 5 and 6 (diploma). These are avenues for both technical and academic institutions to design programs in that direction.

Second, the way they acquire skills suggests that if programs on phone repair are to be designed, they should consider their learning modalities example; the trial-and-error method suggests that repairers are ready to carry out several trials because they have an interest in mastering the skills so there must be a lot of opportunities for practice. This implies that if programs on phone repair are to be established there must be enough resources for students to practice. Examples of trial-and-error methods in repairing mobile phones include connecting phones to the internet, setting the phones, replacing phone-housings, and repairing screen protectors. The aforementioned statement aligns with Ahmed et al. (2015) who argue that through trial and error, some repairers have acquired mobile phone repair skills which have enabled them to open up roadside shops that connect phones to the internet, change housing, fix protectors, and others operate alongside other repair operations in large informal markets. Similarly, Baptiste et al. (2019) asserts that learning through practical activity makes the learning effective because it allows full participation of the senses, hence, uncomplicated mastery of the skill.

Another way is learning by observing others. Repairers unveiled that they obtained mobile phone repair skills by observing the more skilled mobile phone repairers. For instance, they observed from the experienced and more knowledgeable repairers specifically how to open a phone, how to assemble the phone, and how to change the housing of the mobile phone. This implies that if a program should be established there should be opportunities

for learners to attach themselves to those doing repairing for considerably enough time before they can graduate and qualify as repairers. The above description aligned with Ahmed et al. (2015) who disclose that mobile phone repair learners should intensively observe experienced and more knowledgeable mobile phone repairers. In this regard, learners would have an advantage in remembering what and how the knowledgeable and experienced mobile phone repairers are doing.

In addition, it was suggested that there should be short courses that run on a part-time basis rather than full-time to give opportunities for learners to practice or those already with repair shops to take the course alongside their jobs. The statement concurred with Eze et al. (2017) who argue that there should be short time training of three months relating to mobile phone repair that would allow new learners and experienced mobile phone repairers to attend their courses while attending to their responsibilities. Similarly, Ahmed et al. (2015) argue that there should be a month mobile phone repair training centre and a 3-weeks apprenticeship.

2.11 Limitation of the Study

The researcher encountered some challenges, but it is important to note that these challenges did not in any way compromise the findings of the study. First, the participants were busy serving the customers as they participated in the study. Secondly, the researcher faced challenges in finding the literature relating to the study carried out. Considering these factors, the study took a long time to be accomplished.

2.12 Conclusion and Recommendations

- ❖ Mobile phone repairers are motivated by various factors to join phone repair businesses. The factors include;
 - a) Income problems
 - b) Encouragement
 - c) Prestige
 - d) Opportunity grabbing.
 - e) Employment problem is another motivation that drives youth to engage in the mobile phone repair industry. All these call for mobile phone repair at different levels. Such levels include level 1 (deals with basic repair) level 2 (intermediate) and level 3 (advanced) knowledge. Other levels include level 4 (for certificate), levels 5 and 6 (diploma). These are avenues for both technical and academic institutions to design programs in that direction.
- ❖ Mobile phone repairers acquire skills both formally and informally.
- ❖ The government should encourage people with mobile phone repair skills to upgrade or attend professional training to provide essential and good service.
- ❖ The government should broaden cooperation with other education stakeholders to provide vocational education on mobile phone repair, such as VETA.
- ❖ Designed program on mobile phone repair should consider their learning modalities. For example: carry out several trials to master the skills. This implies that if programs on phone repair are to be established there must be enough resources for students to practice. Examples of trial-and-error include connecting phones to the internet, setting the phones, replacing phone housings, and repairing screen protectors
- ❖ There should be short courses that run on a part-time basis rather than full-time to give opportunities for learners to practice or those already with repair shops to take the course alongside their jobs

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CHAPTER THREE: Paper Two

3.0 Comparing the Mobile Phone Repairers' Demands with Vocational Education Training Authority Curriculum

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Abstract

This qualitative study compared mobile phone repairers' demands with Vocational Education Training Authority (VETA) curriculum. Data were collected through (i) interviews from 15 mobile phone repairers in Morogoro municipality, 5 vocational Education trainers and 20 customers (ii) document review, and (iii) observations of mobile phone repairers' practices. The findings revealed that the skills provided by VETA relating to mobile phone repair is basic and could be considered level one to level three. Most mobile phone repairers were not satisfied with this low level of skills and demanded that VETA provides this training at higher levels, preferably starting from level one to level six. The study noted further that about 60% of mobile phone repairers needed formal training while 35% of them needed non-formal training. Therefore, it is recommended that the government should facilitate mobile phone repair training institutions like VETA and Dar es Salaam Institute of Technology (DIT) to provide specialist skills relating to mobile phone repair. This would help training institutions to meet the demands of mobile phone repairers.

Keywords: Tanzania, curriculum, VETA, mobile phone repairers.

3.1 Introduction

The development of mobile phone technology has become one of the fastest-growing technologies in the world (Douglas, 2015). Since the 1990s, mobile phone ownership has increased in Africa (Mtenzi et al., 2008). According to Msikula, (2016) one-ten of persons currently own a mobile phone in Tanzania, Kenya, Uganda, and Ghana. The increased ownership and use of mobile phones have necessitated professional technicians to maintain and repair mobile phones. Agar (2003) argues that there should be curricula related to mobile phone accessories required to train people interested in the mobile phone repair and maintenance industry. Manner (2018) and Baptiste et al. (2019) indicate that training relating to mobile phone repair skills enables repairers to develop skills and provide adequate mobile phone repair services. Hence, curricula have been established in various countries to train people who wish to carry out mobile phone repair activities.

Ahmed et al. (2015) argue that in Bangladesh people had established individual curricula relating to mobile phone repair whereby some courses are provided for a month at a local mobile phone repair centre. In contrast, others took a 3-week apprenticeship at another repair workshop under a senior repairer. Chikwuedo & Nwachukwu (2014) argues that, in Nigeria, mobile phone repair curricula were introduced in the technical colleges where he reports that mobile phone repair training has been established individually and are under private institutions like Common Wealth to provide required skills for the repair and maintenance of mobile phones. This has necessitated developing mobile phone repair courses through distance learning to address mobile phone repairers' demands (Pearce 2013). Tanzania Communication Regulatory Authority (TCRA) in collaboration with the Dar es Salaam Institute of Technology (DIT) and Kipawa Vocational Training Authority (VETA) developed a mobile phone repairer's course to facilitate certification for the provision of the electronic equipment repair license to the practicing mobile phone technician (URT (2017).

Most of the curricula provided by different countries have relatively common objectives: disassemble and assemble mobile phones, identify their faults, and repair them (Msikula, 2016). The literature, however, did not record how these curricula have addressed clients' needs and repairers' demands. This calls for a study assessing how phone repairers have gained from the established curricula in their countries. In addition, there is a massive scarcity of official servicing shops expected to offer mobile phone repair services in Tanzania. For this reason, Tanzania through authorized institutions like VETA Kipawa and DIT established a mobile phone repair curriculum in 2017 and has been implementing this curriculum since 2019 (URT, 2017). This curriculum has been used to train people interested in mobile phone repair activities to equip them with the required skills for mobile phone repair activities. Despite mobile phone repair and maintenance programs in various technical institutions in Tanzania, it is unknown to what extent the training package reflects the need of stakeholders. Also, there is limited information (if any) on whether the training modality meets the demands and interests of many mobile phone repairers and servicing repairers across the country, especially in Morogoro Municipality. In addition, because of the continued evolution of mobile phone versions, it is obvious that repairers must continue to update their skills. How mobile phone repairs manage to update their skills to match the ever-changing mobile phone technology is unclear. This study aimed at addressing these questions.

3.2 Method

This study employed a qualitative approach to get in-depth information and was organized within the realms of type II embedded case study design. The approach was selected to enable the researcher to develop individual details involved by the actual participants (Creswell, 2012). Data were collected from 15 mobile phone repairers, 5 VETA trainers and 20 customers who were engaged using snowball and purposive techniques. Mobile

phone repairers provided information relating to the skills they have and what they demand. VETA trainers gave information concerning with courses they offer, training formality and approach, challenges relating to training, and enrolment qualifications while customers gave information on services provided by the repairers. The raw data gathered through interviews were organized into manageable units according to their themes. These units included data relating to what extent the VETA curriculum addresses the demands of mobile phone repairers. Documents were reviewed to find out the contents of the VETA curriculum. Thematic analysis was used to analyse qualitative data collected through interview.

In this study, the researchers ensured validity by employing semi-structured interviews with mobile phone repairers, VETA instructors, and customers. Also, the documents and findings were reviewed regularly to confirm their validity. The raw data were described as collected from diverse participants. A general description of the results involved extracting the meanings, actions, and feelings of what has been observed (Kumur, 2011). The back-forth translation techniques were used to preserve the validity of the study findings. The researchers were not limited to translating the interview guide into the Swahili language for those participants who were illiterate in the English language. The reliability was determined through collaboration and after analysis, the findings were taken to the participants to validate if the information included in the study were real as provided by them.

To preserve norms and research values, the participants were pre-informed on their willingness to withdraw themselves any time they wish. The researcher prepared the interview without asking irritating questions to participants. Also, the researchers ensured any transcription and interview scripts were kept to ensure confidentiality. Moreover, the researchers asked permission from all offices authorized to provide permission to collect information from the study area preceded by Sokoine University of Agriculture.

3.3 Comparing the Mobile Phone Repairers' Demands with VETA Curriculum

This study intended to determine the extent to which the VETA curriculum on mobile phone repair meets the demands of mobile phone repairers. The question guiding this objective was, "to what extent does the training package reflects the deed, and the training modality meets the demands and interests of mobile phone repairers?" To achieve this objective, the researchers generated information on the training package and to what extent they meet the market demands of mobile phone repairers.

3.3.1 Types and forms of mobile phone repaired

In this aspect, the data were collected through interviews and observation. The results revealed that smart phones, mainly TECNO, NOKIA, Vivo, Infinix, and Itel, are the most repaired phones. It was noted that some mobile phones especially LG, iPhones, iPad, and Samsung versions are complex and complicated to repair. This information is affirmed by participant O, one of the experienced mobile phone repairers who stated,

“Most Android phones such as Infinix, Samsung, Tecno, Itel, Vivo, and Nokia have different types of faults related to; broken LCD, touch screen, memory IC, Power IC, charging control IC, microphones, speakers, network, flashing, unlocking, repairing, reading and password. On the other hand, a few iOS phones, iPhones and tablets faults involve broken LCD, NAND IC, touch IC, DFU mode, are complicated to repair” (O, 2022).

The data further revealed that a few of the mobile phone repairers deal with iPhones only. For instance, participant L, one of the experienced mobile phone repairers narrated, *“I repair only iPhone mobile phone because it is my hobby and there are no other repairers more competent than me”*. Findings obtained through an interview with VETA trainers revealed that mobile phone repair trainees from VETA are trained on how to repair all kinds and forms of mobile phones. The argument was evidenced by participant W, one of

the VETA trainers who disclosed, *“VETA guides are general without considering the type and form of mobile phone. The trainee can use such skills to repair any phones”*.

3.4 Training Package

The researcher through document review explored the training package meant for mobile phone repairers as covered in the VETA curriculum. The data was triangulated under documentary review and interviews with both the repairers and trainers from the VETA institute.

The findings from the document showed that the VETA curriculum offers various courses including basic, intermediate, and advanced levels. Participant X, one of the interviewees from VETA uttered, *“For now we are only providing general skills relating to mobile phone repair because it does not need more advanced and latest technology compared to levels four, five, and six. Participant Y from VETA, echoed, “Level four is for certificates while level five and six are for a diploma which is very expensive to handle and need the latest and advanced technology”*.

3.4.1 Customer care and satisfaction

Interviews with mobile phone repairers revealed that skills related to customer care are required by mobile phone repairers. These skills include persuasive speaking skills, empathy, and adaptability, the ability to use positive language, clear communication skills, self-control, responsibility, advertisement, and patience. For example, participant N, one of the experienced mobile phone repairers disclosed, *“Mobile phone repairing needs skills relating to customer care like the use of polite language, communication skills, price negotiation, and tolerance”*. The documentary review showed that customer care provided under VETA includes time management techniques, selling techniques, politeness to the customers, pricing, and negotiation as analyzed in URT (2017). Besides the review, the interview with VETA officials complimented the findings that training offered includes

customer care. For example, participant V, one of the VETA trainers, narrated, *“Training relating to mobile phone repair we provide includes customer care which is an important aspect in this business”*. The finding aligns with Ibezim et al. (2014) who argue that any training relating to mobile phone repair should feed and keep repairers with skills relating to good customer care. Hence a repairer needs to have such skills to accommodate customers’ interests as noted in Manner’s (2018) observation that customers do not like waiting, harsh and abusive language and waiting may cause a strong reaction. The results show that customers are satisfied with the services they receive from phone repairers. However, some customers complained of unfair charges imposed on them as the cost of fixing a damaged phone. They thought the charges were not worth the defect or spare parts needed. For example, participant P said, *“I was charged a lot of money to fix a system charger”*.

3.4.2 Multi-meter application

The findings revealed that multi-meter application skills are very important in the mobile phone repairing business. For example, participant C one of the repairers with experience of fourteen years in repairing mobile phones disclosed, *“In repairing the mobile phone, multi-meter is vital equipment which is needed for diagnosing faults, measuring resistor, and it is used in identifying the voltage of items like IC”*. From the document review, it was noted that the VETA curriculum provides general skills relating to the multi-meter application, and not all the multi-meter application skills needed by mobile phone repairers are included in the curriculum. For example, the use of a multi-meter to identify the power of each IC in a mobile phone is not included in the curriculum. This was evidenced by participant Y, one of the VETA trainers, who narrated, *“For now, we are only providing general skills relating to the use of multi-meter in mobile phone repair*

because it does not need more advanced and latest technology". The finding aligns with Douglas (2015) who insists that training provided by various institutions on the multi-meter application do not meet the demands of the mobile phone repairers.

3.4.3 Use of modern mobile phone repair tools

Mobile phone repairers need training relating to how to choose and use appropriate tools for appropriate faults, identify instruments, and assemble and disassemble mobile phones. For instance, participant M, one of the mobile phone repairers with experience of thirteen years in repairing mobile phones disclosed, *"Many mobile phone repairers lack skills on how to choose the appropriate tool to be used in assembling and disassembling the specific mobile phone because each phone type and version has its tools to be used in repairing it"* Findings revealed that the skills required by repairers on this topic are covered under VETA curriculum (URT 2017:8-9). These skills include how to use SMD rework station, apply BGA soldering station, hot air gun, use de-soldering wire, and employ PCB stand/holder. In addition, this topic includes the use of the microscope, use of test jig, apply LCD opening pliers' cell, use of LCD separator for phone glass, apply LCD tester, use of battery booster, and use of the ultrasonic cleaner. This was evidenced by participant Z, one of the VETA trainers, who disclosed, *"Any training relating to mobile phone repair should train repairers how to select and use appropriate modern tools to repair mobile phone"*. The finding aligns with Douglas (2015), who insists that hundreds of modern tools for mobile phone repair are available in the market but most of the repairers do not have skills on how to use them. However, there is an improvement in fault diagnosis. For instance, Alome & Ogumah (2019) observed that currently, mobile phone repairers have improved from the manual technique of diagnosing faults in a mobile phone to the use of diagnostic scan tools.

3.4.4 Hardware and software troubleshooting

Hardware and software are major aspects of both computers and mobile phones. Findings obtained through interviews showed that mobile phone repairers need skills relating to software and hardware troubleshooting. For example, participant D, one of the repairers with experience of two years in repairing mobile phones disclosed, *“A large number of mobile phone repairers are not competent in repairing mobile phones with faults relating to software because more mobile phone faults are based on hardware and those with software skills face challenges in repairing hardware faults”*. Findings obtained from the VETA curriculum revealed that skills relating to hardware and software needed by mobile phone repairers are included. In software, the curriculum includes how to identify display not displaying fault, describe the phone's reason for not charging, translate the signal message and identify software related to phone overheating. Hardware troubleshooting training includes how to repair keypads, choose and use hardware repair tools, repair touch screens, replace the display, and repair phones with network and charging problems as revealed in URT (2017:9-11). Participant Z, one of the VETA trainers disclosed; *“training provided by VETA entails how to deal with software and hardware faults in mobile phones”*. The argument concurs with Eze et al. (2017) who argue that mobile phone repair and maintenance are carried out when there are existing faults which are grouped into software and hardware faults. For these faults to be addressed, they need competent and skilled technicians.

3.4.5 TCRA regulations guiding mobile phone repair

Various regulations are guiding various human activities. One of the human activities is mobile phone repair. The interview discovered that mobile phone repairers need to learn regulations that guide them in the mobile phone repair business. They argued that it is hard to access the TCRA regulations, especially for ordinary people and repairers who are not dealing with those regulations.

Due to poor skills of TCRA regulations relating to mobile phone repair, mobile repairers face disturbances from police officers. They argued that they are disturbed mainly for two reasons, first for buying or repairing stolen mobile phones, and secondly, for not having official registration. For example, participant E, who is one of the most, experienced mobile phone repairers noted, *“We face the challenge of harassment from Police officers who always think that every flashed mobile phone is stolen”*. Furthermore, research findings indicated that the course relating to mobile phone repair should include the TCRA regulations that guide the repair and maintenance of mobile phones and other related services. For example, participant A, one of the mobile phone repairers noted, *“We face challenges in identifying TCRA regulations that guide the repair and maintenance of mobile phones; thus, we need a course relating to those regulations”*.

However, it was learned from an interview with police officers that not all the registered mobile phone repairers are authorized to flash mobile phone or change its IMEI number. These registered mobile phone repairers have unique identification from the TCRA displayed in their offices. Participant S, one of the senior police officers, emphasized, *“Flashing phones is a crime. To us, this is one of the counter combers to avoid this. When we arrest them, all properties, including tools for flashing or unlocking phones and phones in the flashing process, are taken because they have no evidence that allows them to flash or unlock phones. So, the tools and phones are taken as evidence until they are proven safe, which may be taken back to the owners”* (S, 2022).

Participant T, one of the police officers added, *“Mobile repairers authorized to flash mobile phones are not faced with such challenge of flashing mobile phone”*. This argument was evidenced by participant F, one of the more experienced mobile phone repairers who echoed, *“I follow TCRA regulations by recording the IMEI number of each phone that needs to be flashed and record details of the customer before changing the circuit of that mobile phone”*.

Thus, based on those challenges, the police officers and the repairers suggested the training curriculum should include TCRA regulations which they believe will reduce the challenges revealed. From the document review, the researcher found out that the required regulations are included in the VETA curriculum. URT (2017) discloses that TCRA regulations aim at equipping mobile phone repairers with ethics, and governing rules.

3.4.6 Phone assembly

Findings through interviews revealed that mobile phone repairers need full training from level one to six. For instance, participant O one of the mobile phone repairers disclosed, *“I need full training from level one to six that will allow me to specialize in repairing specific fault and type of mobile phone”*. Results obtained from document search indicated that the VETA curriculum offers levels one to three that include Basic, Intermediate, and Advanced skills (URT, 2017:3). Micro soldering professional skills, mobile phone assembly skills, chip programming skills, storage expanding skills, and refurbishing skills which are for level four to six are not included in the curriculum. However, the interview with VETA officials disclosed that they have not started offering those courses because are very expensive to run. This was because they are considered specialization courses that need the latest and advanced technology. In addition, VETA trainers echoed that VETA is researching to find if they can offer specialization courses. Participant V, one of the VETA trainers indicated,

“Investing in specialization in mobile phone repair is very expensive and needs advanced technology, though we are researching to see if we can manage. For example only one course of micro soldering is taught in the U.S.A for 5,000 USD for three weeks” (V, 2022)

3.4.7 Materials identification

Findings obtained from an interview held with mobile phone repairers showed that there had been a problem with importing fake accessories for mobile phone repair. Most mobile phone repairers unknowingly buy fake accessories because they lack the skills to identify them. For example, participant M, one of the experienced mobile phone repairers, said, *“Sometimes we go to a shop unknowingly buy fake accessories that last within a few days after they have been fixed”*. Fake accessories are ineffective and do not last for a long time when fixed in mobile phones. Examples of accessories include AC power, charge system, Batteries, touch screen, camera, speaker, etc. Findings obtained from document search indicated that the VETA curriculum offers skills relating to materials identification when repairing the mobile phone. Through an interview with VETA trainers, participant W, one of the trainers disclosed, *“VETA produces mobile phone repairers who are competent enough in identifying fake and original spare parts when fixing a mobile phone”*. Moreover, the VETA curriculum includes some consumable materials that mobile phone repairers need skills how to identify as presented in Table 2.

Table 3.1: Consumable materials that mobile phone repairers need

Hand tools	Equipment	Consumable materials
Set of screwdrivers	Freezer LCD separate machine	Soldering wire
Set of tweezers	LCD Lamination Machine	Soldering paste
Opening pliers	Trinocular microscope	Soldering flux
Digital Multi-meter	Smoke absorber	Solder wick
Soldering Iron	SMD Rework Station	Cleaning agent
Wrist rape	LCD separate machine	Heat resistant tape
Mask	Ultrasonic cleaner	SDM passive components
Gloves	Infrared rework station	SDM Active components
Safety goggles	UV light machine	UV glue
Set of Knives	Hot air gun	Freezer spray

Document review, 2021

3.5 Challenges Relating to Mobile Phone Repair Training

Responding to the question posed by the researcher during an interview with VETA trainers, *“Which challenges do you face in teaching the mobile phone repair concept?”* the VETA officials responded to the question that trainers face challenges in getting

teaching facilities like tools and equipment for hardware and software. In addition, they get challenges in getting different sufficient types and forms of mobile phones for trainees to practice during teaching and learning sessions. Furthermore, other challenges they face include micro soldering skills and techniques, using mobile phones for trainees to practice, translating into Swahili language learning materials and vocabularies, latest and advanced technology. Moreover, they face challenges in teaching learners who cannot read and write. One of the VETA trainers who is participant Y indicated,

“There are a lot of challenges in this field, for example, we lack a micro-soldering skill which is very important in mobile phone repair training but is offered only in countries with advanced and latest communication technology like America and China and requires a lot of money to learn” (Y, 2022).

3.6 Area for Curriculum Improvement

This section solicits mobile phone repairers' and stakeholders' views on their demands and interest in a suitable form of training for improving mobile phone repairing service. Several aspects were explored, including teaching approaches, time, mode of delivery, and medium of instruction. Data for this section were obtained through interviews and document searches. The findings are presented in the following sections.

3.6.1 Form of Training

The research findings indicated that most mobile phone repairers went through neither formal nor non-formal training. An interview with mobile phone repairers revealed that there should be a mode of training that they thought would fill the skill gap in phone repair services. More than half of interviewed mobile phone repairers proposed formal training that provides enough time for learners to cover a lot of requirements about mobile phone repair. They maintain that formal training gives learners enough time to practice what they

learn. For example, participant D, one of the mobile phone repairers argued, *“Learning through the formal system will provide us enough time to learn and do practical, learn how to care and handle customers, learn TCRA regulations and other related issues to mobile phone repair”*.

On the other hand, nearly half of the interviewed mobile phone repairers proposed non-formal training as a suitable form of training. Their argument was based on the fact that they don't need more time in class than upgrading sessions, given the changing technology. For instance, participant C one of the mobile phone repairers commented, *“You know the technology is changing every day, and even the mobile phone accessories are changing with new modernized forms. We need to use a non-formal training system to learn how to use new spare parts to repair new phones”* (C, 2022).

Document reviewed revealed that; VETA offers non-formal training which is short course training providing general skills (level one to three) to mobile phone repair (URT, 2017). Formal training run from level one to level six where the graduate is certified with a certificate or diploma compared to a non-formal graduate who is certified with a recognition certificate. This argument is in line with participant Z, one of the VETA trainers, who said,

“It is difficult to offer level four to six because it needs high technology to run compared to informal and level one to three. Due to global change in technology, it is necessary to start to offer it to meet the high demands of electronic technicians” (Z, 2022).

Furthermore, the findings obtained through an interview with mobile phone repairers show that most mobile phone repairers were interested in training covering a short period. They argued that spending more than one year in training will make them fail to do other activities like earning money for accommodating their families. For example, participant M, one of the mobile phone repairers argued, *“I need training relating to mobile phone*

repair, but it should not take more than one year because it will interfere with my other programs of earning money”.

Most of the repairs suggested training to take three months to six months. The suggested duration will give a chance to the learners to attend to other responsibilities that need attention. This was evidenced by participant N, one of the mobile phone repairers who said, *“I need three to six months of training to refresh and update skills of mobile phone repair while proceeding with other activities”*. The statement concurs with Eze *et al.* (2017) that there should be a curriculum of three months that would teach and cover the usage of common hand tools, measuring instruments, usage of communication systems, fault-finding of mobile phones, and their rectification. However, Ahmed *et al.*, (2015) argue that there is a month (long training program) mobile phone training centre and a 3-week apprenticeship. On the contrary, participant G argued, *“The effective training relating to mobile phone repair should take one year and above to allow us to learn many contents relating to the field”*.

3.6.2 Admission and qualification

3.6.2.1 Admission Criteria

In this aspect, the study first established the admission criteria in the existing curriculum. Then, the participants were asked to comment whether they recommend any adjustments to the current criteria. It was noted that the current practice accommodates anyone who wishes to join the course. Trainees who wanted to join the classes were categorized into various groups. The groups include those who cannot read and write but are well experienced in the industry, primary school dropouts, primary school leavers, secondary school dropouts, secondary school leavers, vocational trainees, repairers, engineers, and degree holders. This was also manifested during the interviews with VETA trainer participant W, who said, *“Mobile phone repair course is for different groups of people with different education and qualifications”*.

On the contrary, however, VETA trainers disclosed that all learners of different levels of education are enrolled and considered beginners with poor skills of mobile phone repair. This is because they are taught competence-based skills from basic to advanced level, whereby 60% of the whole training course is based on practical. Participant X, one of the VETA trainers, argued, *“For us, all trainees are treated equally without considering their level of education and qualifications because all are considered beginners and are taught competence-based”*.

Furthermore, data from the interview revealed that learners are subjected to placement tests before they are given opportunities to choose programs or levels of their needs. Thus, the placement exam determines where and at what level the trainee should be registered. There are two sets of exams, written for those who can read and write and oral exams for those who cannot read and write. The exams are administered in Swahili, the national language that every Tanzanian master. This was evidenced by participant Y, one of the VETA trainers, *“During the assessment process, trainees are assessed through the Swahili language by considering their understanding level of reading and writing, whereby those with writing and reading problems are assessed orally”*. The findings indicate that both the repairers and trainers recommend the current admission practice to continue.

3.6.2.2 Qualification Award

The VETA program provides training based on basic, intermediate, and advanced training from stage one to stage three. The courses take different duration depending on the level. For example, the introductory mobile phone repair course is a four-week course, and the Intermediate takes six (6) weeks, while advanced mobile phone repair covers two (2) weeks. These are the lowest levels where trainees are given attendance certificates upon completing the courses. The curriculum does not offer specialized courses or programs which repairers most require.

The interview findings revealed that mobile phone repairers need to attend courses where they will be awarded National Technical Awards (NTA) as described by NACTE. The levels include NTA level 4, a basic technician certificate, NTA level 5, a technician certificate, and NTA level 6, an ordinary diploma. From an interview with VETA trainers, it was revealed that VETA does not offer these skills because there are no such skills or training equipment. For example, participant Y, one of the trainers disclosed “*This is not a simple course for us to offer because we do not have skills and training equipment required for offering such levels*”. More investment is needed to facilitate VETA acquiring such skills and get specific equipment to offer the required levels.

3.7 Specialized Mobile Phone Technology

On the other hand, an interview with mobile phone repairers indicated that one needs special training programs to learn other brands of mobile phones. It was disclosed that mobile phone brands such as Apple and iPhones need special training because their mode and software system set-up is different from Android phones (TECNO, Infinix, Itel, Vivo, Htc, etc.). For example, participant L, an expert in iPhone repair, indicated that training or course of study should include the following items portrayed in Table 3 below to learn iPhone repair effectively.

Table 3.2: iPhone proposed contents.

S/N	Contents	S/N	Contents
1.	Face ID complete theory	17.	Iphone6-12 common faults
2.	A solution to a little higher /lower	18.	No services/searching theory
3.	A solution to being unable to activate faced	19.	No service/searching detecting
4.	A solution to the dot/infrared problem	20.	Fast way to detect no booting
5.	A solution to flood illuminator	21.	Fast way to detect short circuit
6.	Oscilloscope skill	22.	Fast way to detect boot loop
7.	How to detect CPU in seconds	23.	Fast way to no IMEI/no firmware
8.	How to detect and in seconds	24.	Panic full skill
9.	How to detect ram in seconds	25.	Nand programming
10.	How to detect PMU in seconds	26.	Eeprom programming
11.	A8-a14 CPU new skill	27.	Boost/Buck/LDO circuits
12.	Safe &fast way to swap board	28.	12C/125/SPI circuits
13.	Data recovery	29.	MIPI/LDPD/MOSI/MISO circuits
14.	Error codes theory	30.	Motherboard jump wire
15.	A solution to all error codes	31.	CPU jump wire
16.	Separate &laminare middle frame	32.	Purple screen & repair tools

Source: Field Data, 2021

The results from the VETA indicate that although the skills are essential to phone repairers, the VETA officials think that this has to be in the form of specialization courses. However, they believe that providing such technology is very expensive, and thus, before investing in it, a market survey needs to be done to see if it is worth doing. For example, participant V, one of the VETA trainers, added, *“Financing in chip programming skills, storage expanding skills, and refurbishing skills are very costly and need the latest technology”*.

3.8 Medium of Instruction

The research findings revealed that most mobile phone repairers prefer training to be carried out using both English and Swahili. This will make it easy for them to understand the modern tools written in English and thus need to be translated into Kiswahili for easy understanding. For example, participant H, one of the experienced mobile phone repairers stated, *“English and Swahili languages are very important in teaching and learning processes”*.

However, some mobile phone repairers prefer the Kiswahili language because they argue that the majority of mobile phone repairers are not competent in the English language. For instance, participant M, one of the experienced mobile phone repairers argued, *“Many mobile phone repairers are abysmal at foreign languages, so teaching through foreign language will exclude us from the opportunity”*.

The findings from an interview with VETA officials disclosed that mobile phone repair training is carried out using the Swahili language to make all learners understand easily. Furthermore, teaching and learning materials are prepared in the Kiswahili language. However, complex concepts which do not have a direct Swahili word are described in English but explained in Kiswahili. This was evidenced in the following quotation from

participant Z, one of the VETA trainers, *“We enrol learners of different levels of education, so even training is carried out using the Swahili language to give equal chances to all learners”*.

Participant Y one of the VETA trainers added, *“We have decided to form reference materials in the Swahili language to make all learners understand the content easily during the teaching and learning process”*.

The findings concur with Ahmed *et al.* (2015) who assert that one of the famous phone repairers uses the local language Bangla repair blog for local repairers who do not understand English in Bangladesh. Therefore, it is vital to use the language which the learner understands. However, the English language should not be neglected because most devices and accessories are written in English.

3.9 Training Approaches

The findings indicate that phone repairers prefer both theoretical and practical training approaches. Mobile phone repairers and trainers argue that merging the two methods simplifies content delivery and facilitates easy learners' understanding because learners can relate the theory with practical learning. For example, participant I, one of the more experienced mobile phone repairers said, *“Learning theoretically and practically will help us relate what we have learned in class with what we are supposed to do in the real sense”*.

It was revealed that the current approach proposed in the curriculum includes 40% theoretical training and 60% practical. This method enhances trainees typically to learn by doing what makes life easier. Participant X, one of the interviewed VETA trainers indicated, *“Learning through both explanation and action facilitates and simplifies understanding because learners will be able to relate the theory and practical learning”*.

It was noted that the current teaching approach is the best as it gives more time for a practical session for the learner so as to identify the problems and correct them appropriately by themselves. The findings align with Chukwuedo and Nwachukwu's (2014) conclusion on the acceptable and preferable educational system. They argue that the formal education approach is characterized as a system with a fixed curriculum and a cadre of certified teachers with standard pedagogical methods for skill acquisition where theory and practical learning are emphasized.

3.10 Discussion

This study intended to reveal the needs of mobile phone repairers and VETA mobile phone repair contents. The main issues investigated included types and forms of mobile phone repairers, customer care and satisfaction, multi-meter applications, use of modern mobile repair tools, hardware, and software troubleshooting, TCRA, phone assembly, materials identification, and challenges relating to mobile phone repair training. It also includes the form of training, admission criteria, qualification awards, specialized mobile phone technology, medium of instruction, and training approaches.

Mobile phone repairers claimed that some mobile phones are simple while others are difficult to repair. They argued that mobile phones, like iPhones, and iPad are difficult to repair compared to TECNO, and Itel. Some form of training in mobile phone repair is needed to cover the existing gap between simple and complex mobile phones. This will help the mobile phone repairer to deal with all kinds of phones without discretion. These findings corroborate with that of O'dea et al. (2021) who argue that mobile phone repairers are faced with the challenge of repairing difficult mobile phones like iPhones compared to simple mobile phones like Infinix, hence they assisted each other.

Under the training package, levels one to three are provided by the VETA curriculum. These include basic, intermediate, and advanced levels (URT, 2017). Mobile phone repairers' concern is based on the application of a multi-meter tool which is used to identify the faults of mobile phones, whereby the general skills relating to multi-meter is provided under VETA training. The use of modern mobile repair tools emerged as a concern to mobile phone repairers to provide them with skills in choosing the right tools relating to specific mobile phone faults, including assembling and disassembling. These findings concur with those of some other authors such as Douglas (2015) and Alome & Ogumah (2019) on the essential use of multi-meter and use of modern tools respectively. Mobile phone faults are categorized into hardware and software troubleshooting, hence, skills relating to these faults is needed in the mobile phone repair industry as argued by Eze et al. (2017) that repairing of mobile phone is pre-determined by considering the nature of faults either is software or hardware fault. VETA curriculum provides pieces of training relating to software and hardware troubleshooting (URT, 2017). The issue of TCRA regulations emerged from mobile phone repairers. Poor understanding of laws and regulations relating to mobile phone repairers has made mobile phone repairers fall in trouble with the police officers calling for TCRA issues to be significant in the curriculum which also seems to be considered by VETA.

Mobile phone assembly concerned with micro-soldering professional skills, mobile phone assembly skills, chip programming skills, storage expanding, and refurbishing skills; are most needed by mobile phone repairers. However, these skills need the latest technology which is not affordable in VETA pieces of training because it needs a high cost to invest in levels four to six which comprise such needed skills.

The mobile phone repairers insisted on the VETA curriculum to entail short and long courses which can be attended by all as noted by Ahmed *et al.* (2015) and Eze *et al.* (2017). Non-formal pieces of training may be provided specifically to those repairers who can study out of the training environment as evidenced by Hauston (2019). Distance study will allow trainees to proceed with their jobs (Msikula, 2016). Apart from such improvement, mobile phone training is provided by considering both languages, English and Swahili because trainees' educational levels are not considered during enrolment. Approaches considered in providing the pieces of training include both theory and practical which were viewed by repairers as useful for them. Currently, VETA graduates in mobile phone repair are recognized instead of certified.

3.11 Conclusion

While the findings, of this study, may not be generalized, they succeeded to point out that VETA officials under specified ministries as well as the government have made a great effort to solve the unemployment agenda. This has been done through providing training where a trainee after the course of study, can employ himself or herself. The existing gap between the VETA curriculum and mobile phone repairers' demands has made a gash to solve the problem. However VETA curriculum does not meet the needs and interests of the mobile repairers. Nevertheless, the identification of such gaps leads to improving the areas of weakness of the present curriculum.

3.12 Recommendation

The research paper compares mobile phone repairers and the VETA curriculum. The findings revealed that there is a gap between clients' needs and mobile phone repair courses provided by VETA. From a Humanism point of view, VETA training should be organized in a free modality where formal and non-formal pieces of training are offered.

This helps trainees to continue with their jobs in their respective areas. It is therefore recommended that VETA officials in collaboration with government bodies should revise its curriculum by considering the need analysis results from done research. It further recommended that, by considering the vital changes in technology which has made a great pace in innovation and modifications, there is no doubt that new pieces of training should be provided. Hence, mobile phone repairers should attend such new courses and building capacity workshops to cover the present gap in mobile phone repair skills. Generally, mobile phone repairers should not only be certified as professionals like other cadres so that they can give effective services relating to their profession, but also such vocational programs should be organized at all levels to cater for all learners to be self-dependent.

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CHAPTER FOUR

4.1 General Discussion

It has been noticed that people are motivated by several drives to join any business or field. For instance, the study findings revealed that mobile phone repairers use formal and informal means to acquire the desired skills. For example, Msikula (2016) argues that many graduates from IT institutions offer mobile phone repair services and teach mobile phone repair skills to those interested in the industry in Kariakoo streets. Furthermore, the research findings revealed that mobile phone repairers learn and acquire skills relating to mobile phone repair through more knowledgeable and experienced repairers. The argument concurs with Ahmed et al. (2015) that mobile phone repair trainees should intensively observe how the experienced mobile phone repairers perform the process of phone repair.

Research findings also proved that mobile phone repairers are motivated by various factors to join mobile phone repairing business. These factors include income and employment opportunities, encouragement and prestige. The argument agrees with Kotey et al. (2017) that several youths join the mobile phone repair business as a sense of superiority and status. In addition, mobile phone repairers perform phone repair business as it is the main employment opportunity available. This concurs with Baptiste et al. (2019) and Laitala, et al. (2021) who state that repairing mobile phones increase employment opportunities among people in developing countries.

For effective mobile phone repair services, mobile phone repair training at different levels are needed. These levels include level one to level three that equip the repairer with the general mobile phones repair skills or level one to level six that offers certificates and diploma in various specializations of mobile phones repair. These programs relating to mobile phones repair should be designed by considering that, currently the repairers'

learning modalities involve aspects of trial-and-error. This implies that teaching methods should focus on giving trainees opportunities for practice. Enough resources for learners to practice are required for effectiveness of the mobile phone repair programs. This concurs with Ahmed et al. (2015) who argue that trial and error help youths to acquire mobile phone repair skills that enable them to open mobile phones repair and service shops. Similarly, Baptiste et al. (2019) argues that learning through practical simplifies the learning process since it allows full utilization of the all.

In addition, mobile phone repairers prefer short courses relating to mobile phones repair that run on a part-time basis rather than full-time courses in order to give them opportunity to proceed with their business of phone repair. This concurs with the views of Eze et al. (2017) who state that a short time training relating to mobile phone repair allows trainees to attend the courses while attending other activities. Also, non-formal trainings are very important to trainees who are interested in studying out of the organised environment (Hauston, 2019).

4.2 Practical Implications

The findings of this study have far-reaching implications. To begin with, there is need to assist the existing youth in this sector by offering some training in order for them to improve their skills.

Secondly there is need to formalise the mobile phone repair sector. The findings clearly show that there is no clear coordination and recognition of this sector despite the fact that it employs a significant number of people who complete various levels of education. Formalising the sector will help regulate the process of service provision, and ensure availability and implementation of a relevant curriculum. This will further ensure availability of the much-needed tools that will equally ensure proper service provision.

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CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings the study concludes that many mobile phone repairers lack necessary skills as the VETA curriculum does not meet their skills demands. Through the findings, it reports that the practices relating to mobile phone repair involves acquisition and application of related skills. However, mobile phone repairers' skills obtained from training institutions do not fully meet their demands and interests, hence the need for more courses is a vital issue to consider. VETA Kipawa and DIT have organized the mobile phone repair courses which are offered to keep both mobile phone repairers and people interested in mobile phone repair businesses with the necessary skills in repairing mobile phones, although the curriculum does not meet fully the needs of the consumers. For instance, mobile phone repairers need trainings related to specialization in micro soldering professional skills, mobile phone assembly skills, chip programming skills, storage expanding skills and refurbishing skills. Mobile phone repairers need the training also to cover level 4 (for certificate), levels 5 and 6 (diploma) in order to keep them with mobile phone repair specialized skills. Training relating to mobile phones repair needs to be organized and offered in an open modality which includes both formal and no-formal training process to allow trainees to attend while continuing with their businesses. This is because mobile phone repairers struggle to acquire mobile phone repair skills through both formal and informal means while performing their job.

5.2 Recommendation

- ❖ The government through ministry of education should invest much in vocational education to promote mobile phone repairing programs; this will encourage young Tanzanians to join the industry hence creating self-employment opportunities in the country.
- ❖ VETA trainings relating to mobile phones repair should be designed and organized by considering availability of teaching and learning resources for trainees' practice.
- ❖ VETA Courses relating to mobile phones repair should provide chances for trainees to practice various activities in mobile phone repair during the training.
- ❖ VETA trainers should collaborate with both curriculum experts and the government to review the courses relating to mobile phones repair trainings by considering results from conducted research.
- ❖ VETA training relating to mobile phones repair should include micro soldering professional skills, mobile phone assembly skills, chip programming skills, storage expanding skills, and refurbishing skills. Therefore, mobile phone repairers should join these courses that will help them go with changes in mobile phone technology.
- ❖ Mobile phone repairers should attend formal trainings relating with mobile phone repair to enhance their skills which will improve the value of their businesses as they will be able to provide adequate services expected by the customers.
- ❖ It is also recommended that, mobile phone repairers should be registered and certified as professionals like other cadres to allow them give actual services relating to their profession.
- ❖ The government through Prime Minister's Office – Labour, Youth, Employment and Persons with Disabilities should facilitate mobile phone repairers to get loans that will help them in renting offices and get modern tools required for mobile phone repair businesses.

5.3 Areas for Further Research

This study opens the room for further research on the matters that this study has not been able to cover. These areas include:

- ❖ The challenges facing the existing forms of training of mobile phone repairers
- ❖ Formalization of mobile phone repair industry through vocational training and higher education
- ❖ Comparative study of the mobile phone repairers' training content and skills between two countries

APPENDICES

Appendix 1: Interview guide

My names are Kabelinde J doing master degree at Sokoine University. The subject matter of the questionnaire deals with the potentiality of the informal technicians dealing with mobile phones repair and maintenance. The aim of this questionnaire is for the research purpose only. In addition, the researcher will confidentially use the information obtained for the purpose of this research only. Please answer all questions to the best of your skills.

Mark your answer by placing a cross (v) in the appropriate block.

Thank you for your time and co-operation

SECTION A: CHARACTERISTICS OF RESPONDENTS

1. Age
2. Sex
3. Education level
4. Marital status
5. Household size
6. Income

SECTION TWO: SKILLS FOR MOBILE PHONE REPAIR

7. How did you learn how to repair phones?
 - i. Apprenticeship
 - ii. Online classes
 - iii. Technical schools
 - iv. Other (specify)
8. What specific repair did you learn?
 - i. Hard ware repair
 - ii. Programming
 - iii. Other (specify)

9. How long did the learning process take you?
 - i. Six month
 - ii. One year
 - iii. Two year
 - iv. More than two year
10. What specific skills do you use most of the time?
 - i. Hard ware
 - ii. Progammes and software
 - iii. Other (specify)
11. Which method of learning did you use?
 - i. Theory only
 - ii. Practical only
 - iii. Both theory and practical
 - iv. Other (specify)
12. Which part of mobile phone maintenance you find the most difficult?
 - i. Hardware
 - ii. Programming and software
 - iii. Others (specify)

SECTION B: EFFICIENCY IN MOBILE PHONE REPAIR

Appendix 2: Interview guide for informal repairers

Mr/Miss____, I wish to know when you started providing this service. Could you tell me?

1. Would you mind informing me how you became a mobile phone repairer?
2. Why did you develop interest on repair and maintenance of mobile phones?
3. What is the response of your customer about the quality of your service on mobile phones repair?

4. How do you get customers?
5. What type of phones do you mostly repair and why?
6. What form of non-formal and formal training do you need to improve on your mobile phone repair skills?
7. How long do you think mobile phones training programme should take and why?
8. What do you think are the most important mobile phones items and aspect that should be included in the training programme?
9. Which language do you think should be used in the training program and why?
10. If it happens that you are selected to join the training program, how would you prefer to learn?
11. Which ways do you use to know and identify the problem affecting a mobile phone?
12. What determines how much you charge your customer?
13. Do you mostly prefer to advise your customer replace or repair what is broken? Give reason for your answer.
14. What do you think should be done by the government to all cell phone repair and maintenance technicians?
15. What challenges do you face in your carrier?
16. How do you solve the challenges facing your work?
17. What are the opportunities related to mobile phones repair?
18. Do you follow TCRA regulations when repairing mobile phones?

Appendix 3: Interviews for VETA trainers

1. Which mobile phone repair courses do you offer?
2. What are the qualifications of students who enrol in your college who pursue mobile phone repair?
3. How do you treat those who have not gone to secondary schools?

4. Which form of training do you use in teaching mobile phones repair?
5. When did you start teaching mobile phone program in your college?
6. How many students have so far enrolled in the program?
7. How many VETA college offer mobile phone repair programs?
8. Which challenges do you face in teaching mobile phone repair courses?
9. Which tools do mobile phone repair trainees use for diagnosis, assembling and disassembling of mobile phones?
10. Which methodology do you use to train your learners?
11. Which aspects of soft and hardware are included?
12. Which aspects of TCRA regulations are included?
13. What should be done to improve services provided by mobile phone repairers?

Appendix 4: Interview guide for the customer

1. How long have you owned a mobile phone (in years)? years
2. What kind of mobile phone do you own?.....
3. How many times does your phone get damaged?.....
4. What do you do when your mobile phone gets damaged?
5. What makes your phone get damaged.....
6. How many times do you take your phone to the repairer?.....
7. What determines how much you should pay the repairer?.....
8. Are repairers fair in terms of charges?.....
9. If you were to advise the mobile phone repairers what would you advise them?
10. Why are you interested to take your damaged phone to your preferred phone repairer?.....
11. To what extent do you get satisfied with the service provided by the phone repairers?.....

12. What criteria do you often use to determine the effectiveness of the services of a repairperson even before the services are provided to you?
13. In your opinion which qualities do you think mobile phone repairers should have?..... Do we have one in Morogoro town?..... If yes who is he/she and where does he stay in town?
14. Which parts of the mobile phones often get damaged?
15. Do you face any challenge from the service you get from the repairers?.....
16. What should be done to improve services provided by mobile phone repairers?.....

Appendix 5: Observation checklist

	Observation items	Adequate	Inadequate	Remarks
1	The flow of the customer			
2	Tools for repair			
3	Customer care			
4	Types of mobile phones			
5	Repairer's office			
6	Procedural followed in repair			