# STUDENT TEACHERS` ATTITUDES TOWARDS DESIGN AND TECHNOLOGY: A CASE OF CHALIMBANA UNIVERSITY

MASTER OF TECHNICAL AND VOCATIONAL EDUCATION THESIS

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UNIVERSITY OF MALAWI

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## DECLARATION

I declare that STUDENT TEACHERS` ATTITUDES TOWARDS DESIGN AND TECHNOLOGY: A CASE OF CHALIMBANA UNIVERSITY is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Date

Signed: _____ _____

## CERTIFICATE OF APPROVAL

We, the undersigned, certify that we have read and hereby recommend for acceptance by the University of Malawi a thesis entitled '*Student Teachers` Attitudes Towards Design and Technology: A case of Chalimbana University'*.

Dean – Postgraduate : _____

Signature : _____

Date : _____

Main Supervisor : _____

Signature : _____

Date : _____

Co-Supervisor : _____

Signature : _____

Date : _____

Head of Department : _____

Signature : _____

Date : _____

## DEDICATION

I wish to dedicate this dissertation to my late brother, Ben Mbao whose unfailing love will live on. To my dear son, Meja, I appreciate the devotion and endless encouragement of my academic accomplishment.

## ACKNOWLEDGEMENTS

I wish to express my sincere thanks to my supervisors Dr. Vanwyk Khobidi Mbubzi Chikasanda and Dr. Lillian Sankhulani for the positive criticism and comments throughout the development of my thesis. I am deeply thankful to Mr. and Mrs. Chirwa in Blantyre, for their endless encouragement and support. Particular word of thanks goes to Professor Plyson Muzumara, whose guidance and commitment were extensive throughout my research. I am also indebted to all lecturers in the Technical Education Department. Finally, special thanks go to my family members for the commitment, support and patience. I owe my gratitude and thanks.

## ABSTRACT

Attitudes towards learning are important factors on the students' problem solving abilities, inner and external motivations and levels of goal setting. The purpose of this study was to examine student teachers' attitudes towards Design and Technology at Chalimbana University. Despite governments' efforts to allude to the need to reorient the school curriculum to put emphasis on life skills subjects to enable students cope with the demands of the labour market, there are diverse views about the position of Design and Technology in schools and institutions of higher learning. This study focused upon aspects of attitudes namely: materials and equipment, career aspirations, parental influence, time, interest, gender issues and background knowledge. These aspects allowed the researcher to answer the main research question: Student Teachers' attitudes towards Design and Technology: A case of Chalimbana University.

The study was guided by Theory of Planned Behaviour to determine student teachers' behaviour and attitudes. The target population comprised practical subject student teachers at Chalimbana University. Purposive sampling procedure was employed to select 60 respondents from a population. A mixed method sequential design involved an initial quantitative instrument phase, followed by a qualitative data collection phase, in which the qualitative phase built directly on the results from the quantitative phase. Quantitative data were presented in frequencies, percentages, tables and charts while qualitative data were summarized using interview transcripts generated from a coding phase and organized into themes.

Findings from the study revealed that Design and technology remains one of the most exciting areas of study that is in touch with every aspect of human nature hence making it a priority area of study. However, lack of materials and equipment impacted more upon student decision towards Design and Technology. Increasing the availability of materials and equipment which seemed to have a direct effect on student teachers' performance would enhance their attitudes. The study recommends that the Ministry of Education considers providing more funds required for procurement of materials, equipment and construction of workshops and also embark on a long term retraining of staff to build capacity.



**Keywords:** Student Teacher, Attitudes, Design and Technology, University

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## LIST OF ABBREVIATIONS AND ACRONYMS

AIA: Advanced Industrial Arts

BJCE: Botswana Junior Certificate Examinations

CAPA: Commonwealth Association of Polytechnics in Africa

CPD: Continuous Professional Development

DBPS: Diploma in Basic Practical Skills

Dr: Doctor

D & T: Design and Technology

ECE: Early Childhood Education

EOC: Equal Opportunities Commission

ICT: Information and Computer Technology

IVETA: International Vocational Education and Training Association

MOE: Ministry of Education

PATT: Pupils Attitudes Towards Technology

PATT-HK: Pupils Attitudes Towards` Technology-Hong Kong

SADC: Southern African Development Community

SGCSE: Swaziland General Certificate Secondary Education

TPB: Theory of Planned Behaviour

TEVET: Technical Education, Vocational and Entrepreneurship Training

TVET: Technical and Vocational Education Training

UK: United Kingdom

USA: United States of America

UNESCO: United Nations Educational Scientific and Cultural Organization

ZECF: Zambia Education Curriculum Framework

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# CHAPTER ONE

# INTRODUCTION

## 1.1 Introduction

Zambia is undergoing rapid socio-economic development and the education sector is no exception. Education is an agent of change. While education has always been perceived as a social sector, it is also an economic tool for development. Ministry of Education (1996) developed a National Policy on Education, 'Educating Our Future', in order to respond to the developmental needs of the nation, as well as, those of the individual students. This policy has since become the basis for the educational strategies that ensure the provision of quality education through suitable teaching and learning at all levels of the education system.

The development of Design and Technology is not new to the Zambian education system. Ministry of Education (1996) justifies the inclusion of practical and technical education in the school curriculum among other claims by stating that they possess a potential relationship to the world of work, and hence may help to prepare pupils for post-school employment or vocational training. Among the salient features of the 1972 Education Reforms was the emphasis on education with production. Its aim of combining education with production was mainly to help the learners in schools develop positive attitudes towards manual work and equip them with particular life skills.

The importance of Design and Technology is also acknowledged worldwide. In most countries, Design and Technology at primary, secondary and tertiary levels of education is meant to train human resource for employment in industries and to some extent for self- employment. United Nations Educational, Scientific and Cultural Organization [UNESCO] (2001) pursues its objectives through five major programs: education, natural sciences, social sciences, culture, and learning, addressing emerging social and ethical challenges, fostering cultural diversity, a culture of peace and building inclusive knowledge societies through information and communication.

Lungwangwa (1980) in his study on education and humanism, acknowledged the inclusion of technical subjects in the school curriculum. He observed that Zambian Humanism as an ideology was a basis of educational requirement in Zambia. However, the policy for inclusion of Design

and Technology in primary, secondary and tertiary institutions in Zambia was intended to promote, among other things, self-reliance of the education institutions, as well as, individuals. This policy pronouncement came as a result of the poor performance of the economic activities of the country, which could no longer meet the running costs of schools and colleges to the required expectations for their operations.

It is against this background that the Zambia Education Curriculum Framework has been developed to provide further guidance on the preferred type of education for the nation. ZECF, therefore, provides the curriculum guidelines, as well as, the structure at all the levels, from Early Childhood Education (ECE) to Tertiary Education and Adult Literacy. The Zambia Education Curriculum Framework further shows a career pathway that some pupils should be directed to Vocational Career. The necessary career paths for learners at secondary school have been provided to accord learners an opportunity to progress according to their abilities and interests. It is envisaged that the curriculum will equip learners at all levels of education with vital knowledge, skills, positive attitudes and values that are necessary for contributing to the achievement of Vision 2030.

The Zambia Education Curriculum Framework, Ministry of Education (2012), further states that practical subjects (which include; Design and Technology, Home economics and Expressive Arts) constitute a form of knowledge, skills, positive attitudes and values that every person should possess to deal with the physical world. Practical subjects also possess a potential relationship to the world of work resulting in preparing learners for post-school employment or vocational training. In recognition of the importance of practical subjects, every institution of learning will be required to offer Design and Technology as part of their curriculum. At Lower and Upper Primary Education all learners will learn Design and Technology as a compulsory subject.

### 1.2 Background of Design and Technology

The education system in Zambia existed long before Europeans penetrated to the interior of Africa. The type of education that existed was essentially practical in nature to enable the individual to play a useful role in society. Security and well-being of any tribal community depended upon the efficacy of the training given to its' members from infancy to adulthood. Mwanakatwe (1974) indicated that traditional education was essentially practical training which

was designed to enable the individual member to play a useful role in society. He further on states that to the extent that traditional instruction made a contribution to the preparation of boys and girls for living in society, it was in every sense true education.

Design and Technology started as early as schools became operational by missionaries. The development of technical and vocational educational was a comparatively smooth operation in Northern Rhodesia (current Zambia), at least in so far as the early phases of the development are concerned. From early days the government`s policy on practical education and training was clearly defined and consistently upheld. Missionary educators were the pioneers in providing vocational training in Northern Rhodesia. At practically every leading missionary institution established before 1930, school instruction was not confined merely to reading, writing and arithmetic. (the three r`s) In addition to religious work in schools, training in carpentry, building, agriculture and other manual work formed a significant part of the curriculum. In agriculture for instance, the importance of combining theoretical instruction with practical demonstration in the gardens was emphasized.

However, at some point, the development of Practical Education slowed down due to the fact that it was received with mixed feelings by some people owing to various factors. The trade schools were in general poorly equipped and inadequately staffed with trained instructors and the building and construction industry continued to show indifference concerning absorption of graduates from trade schools into employment. The government and industry were therefore expected to collaborate in order to accelerate the training of craftsmen and technicians who were in great demand throughout the country. It was necessary to correct the uninformed and prejudiced attitude of youths towards manual labour. Consequently, more and more capable young men leaving primary and secondary institutions in the years before independence were being attracted by white-collar jobs.

In 1965, the government started to expand Technical Education at secondary level to prepare students who would study technology at the University. This expansion began with David Kaunda and Hillcrest Technical Schools. The reasons were to prepare students for the provision of self-reliance attitude through the production activities in secondary schools. Ministry of Education (1996) reveals that the provision of materials, equipment and books for these subject

areas was problematic; this resulted in theoretical and bookish approach to the subject, without opportunities for the hands-on practical experience that is of its essence.

In this study, the researcher explores the attitudes of student teachers toward Design and Technology. Le Roux (1994) defines attitude as a positive or negative emotional relationship predisposition toward an object, institution or person. Pointing to yet another definition, Wiggins (1991) defined Attitude as enduring non-verbal features of social and physical world, acquired through experience and exert a directive influence on behaviour. Both definitions reveal that, an attitude can be understood as an emotion that has an influence on the behaviour of human beings. People's reactions and responses toward certain things largely depend on how they perceive them.

Despite the governments' efforts and values in the teaching of Design and Technology subject in primary, secondary and tertiary institutions in Zambia, student teachers` attitudes towards the subject is a source of concern. Chalimbana University, born from the original Jeanes School was opened in 1939. In 1975, Advanced Industrial Arts (AIA) was introduced. This was an upgrading course for primary school teachers who had the necessary school certificate qualifications. In 1989 Diploma in Basic Practical Skills (DBPS) was introduced which was later in 1995 affiliated to the University of Zambia under the name of Secondary Teachers' Diploma. With the rich background in Industrial Arts, (now Design and Technology) at Chalimbana University, Design and Technology has the lowest enrolment figures as compared to other practical subjects. Therefore, the study intends to determine student teachers` attitudes towards Design and Technology.

**Table 1: Enrolment figures for Practical Subjects at Chalimbana 2011-2015**

| | DESIGN AND TECHNOLOGY | EXPRESSIVE ARTS | HOME ECONOMICS | TOTAL ENROLMENT |
|---|---|---|---|---|
| 2011 | 24 | 57 | 33 | 114 |
| 2012 | 24 | 57 | 33 | 114 |
| 2013 | 227 | 507 | 1200 | 1934 |
| 2014 | 90 | 266 | 564 | 920 |
| 2015 | 55 | 225 | 308 | 588 |

**Source:** Chalimbana University distance education department (2016)

## 1.3 Statement of the Problem

The current policy on education in Zambia; Educating our Future, Ministry of Education (1996) emphasises practical skills as a means of preparing youths to become useful to themselves and the society after school. The current governments` manifesto also alludes to the need to reorient the primary and secondary school curriculum to put emphasis on life skills subjects to enable students cope with the demands of self-employment and the labour market. One of the objectives for the inclusion of Design and Technology is self-reliance, which implies income generation and repairs (Ministry of Education, 1996). The educational policy`s aim was to collaborate with the institutions responsible for training in practical and life skills disciplines for instance the Ministry of Science, Technology and Vocational Training to expose learners at an early age and at all levels to the culture of entrepreneurship. As a result of the culture of entrepreneurship, the policy further emphasizes the need for Design and Technology departments in schools to meet their running costs through self-sustenance and where possible supplement expenses of the school. However, not much has been done to this effect. The reasons may be due to the lack of information people have on the importance of vocational subjects which could help male and female students receive information and skills and be able to work on solutions to problems.

Mwanakatwe (1974) reveals that the attitude of students are due to lack of vigorous efforts made to publicize primary and secondary schools opportunities which exists in trade schools and the rewards available to properly trained persons. Students also think that the subject is meant for the uneducated people, hence can be acquired without formal training. Although policy statements, scholarly lectures, and discussions at seminars and conferences stand to point out the need for Design and Technology, the grammar school type of education has essentially remained the dominant practice. This has created a paradoxical situation where there is need for Design and Technology. Their growth, development and sustenance of Design and Technology are also largely dependent on societal support, attitudes and manipulations. For example, many societies have encouraged the perpetuation of bookish and academic oriented learning and discouraged the development of practical and applied knowledge type of learning.

Motivation for the study was therefore (a) to assess student teachers` attitudes towards Design and Technology (b) to establish the causes of student teachers` attitudes towards Design and Technology (c) To determine how managers or principals and teachers influence student

teachers` attitudes towards Design and Technology. Findings from this investigation should provide a good understanding of what is taking place among the student teachers with respect to attitudes towards Design and Technology. Some of the causes of these attitudes have been investigated in some schools in Zambia. Not much has been researched in colleges of education in Zambia and Chalimbana University in particular**.** As a result of this, the researcher considers that it is important to investigate and identify factors that influence student teachers' attitudes towards Design and Technology at Chalimbana University.

### 1.4 Purpose

The main goal of the study was to explore student teachers` attitudes towards Design and Technology; establish causes of student teachers` attitudes towards Design and Technology and to determine the role of school managers/principals and teachers towards student teachers` attitudes towards Design and Technology.

### 1.5 Research Questions

This study was informed by the following research questions:

i. What are student teachers` attitudes towards Design and Technology?

ii. What are the causes of student teachers` positive or negative attitudes towards Design and Technology?

iii. How do school managers or principals and teachers influence student teachers` attitudes towards Design and Technology?

### 1.6 Significance of the Study

This study may contribute to the understanding of how student teachers` at Chalimbana University perceive Design and Technology, what their attitudes are towards the subject and compare with findings from similar studies conducted elsewhere. The main benefit of this study was to assist University Lecturers in Design and Technology to understand how student teachers perceive Design and Technology and what their attitudes are towards the subject. This may have implications for curriculum design and teaching and learning strategies employed by lecturers to student teachers` in Design and Technology subjects at Chalimbana University.

## 1.7 Limitations of the Study

It has to be pointed out that attitudes about an issue are essentially subjective and cannot be measured accurately. In other words, attitudes have no universally recognised and accepted scales of measurement and measures in this study cannot be considered to be very accurate. Other limiting factors were outside the scope of this investigation, for example, student teachers` environment outside the institution such as family and cultural background. Perhaps, a more encompassing study that would have covered the parents, student teachers` socio-economic background and issues relating to student teachers` culture would have provided a more meaningful picture.

## 1.8 Definition of Terms

For concepts to carry any meaning within a study, they need to be defined in a clear, non-ambiguous and agreed upon-way. Concepts can be defined either in a conceptual or operational manner. Here, this process is understood as a process of defining a concept by a set of other concepts (Bless & Higson-smith, 1995). The process of defining concepts is essential because it allows for specific contexts to be described and explained in a manner that pertains to the study.

### 1.8.1 Student teacher

A student teacher is a person who is studying to be a teacher and who, as part of the training observes classroom instruction or does closely supervised teaching in an elementary or secondary schools

### 1.8.2 Attitude

Baron and Bryne (1994) contend that attitudes shape individuals` perceptions of the world and their social behaviour and feelings are found to be linked such that people`s attitudes determine their behaviour toward objects and people they meet and influence even the relationships that exist among these with themselves. Furthermore, Le Roux (1994) defines attitude to be a positive or negative emotional relationship with or predisposition toward an object, institution or person. These definitions reveal that, an attitude can be understood as an emotion that has an influence on the behaviour of human beings. People’s reactions and responses toward certain things largely depend on how they perceive them.

### 1.8.3 Design and technology

Design and Technology (D&T) is a school subject offered at all levels of primary and secondary school. It is offered in many countries around the world. Many international schools have courses in design and technology. As a school subject it involves students in designing in a practical context with a focus on, for example, food, textiles, resistant materials or digital media. It is also a university course in many countries, both for the preparation of teachers and for general education in areas such as industrial design. Design and Technology is also defined as an elective 100 or 200-hour course that develops a student's ability for innovative and creative thought through the planning and development of design projects related to real-life needs and situations.

### 1.8.4 University

Merriam Webster Dictionary (2010) defines a university as an institution of higher learning providing facilities for teaching and research and authorized to grant academic degrees. In this context, University refers to Chalimbana University situated in the peri urban of Lusaka province in Zambia from which first and second year student teachers` will participate in the study.

## 1.9 Chapter Summary

In this chapter the main focus was on giving an orientation to the study. This was done for the aim of putting the entire study into context and therefore provided a sense of what was done in this study. Some of the key contents of this chapter were; statement of the problem which elaborated why the problem was important enough to study; the purpose or goal of the study that explained what the study intended to accomplish. The significance of the study was also indicated in this chapter. This section created a perspective for looking at the problem. The significance of the study answers questions on why the study is important; to whom is it important and what benefits occurs if the study is done. Giving attention to aspects such as definitions of concepts used in the study is important, because concepts are defined and understood differently by people, depending on the context that they are used. Therefore, clarifying the meaning of concepts was important as it prevented others understanding the concepts differently.

# CHAPTER TWO

# LITERATURE REVIEW

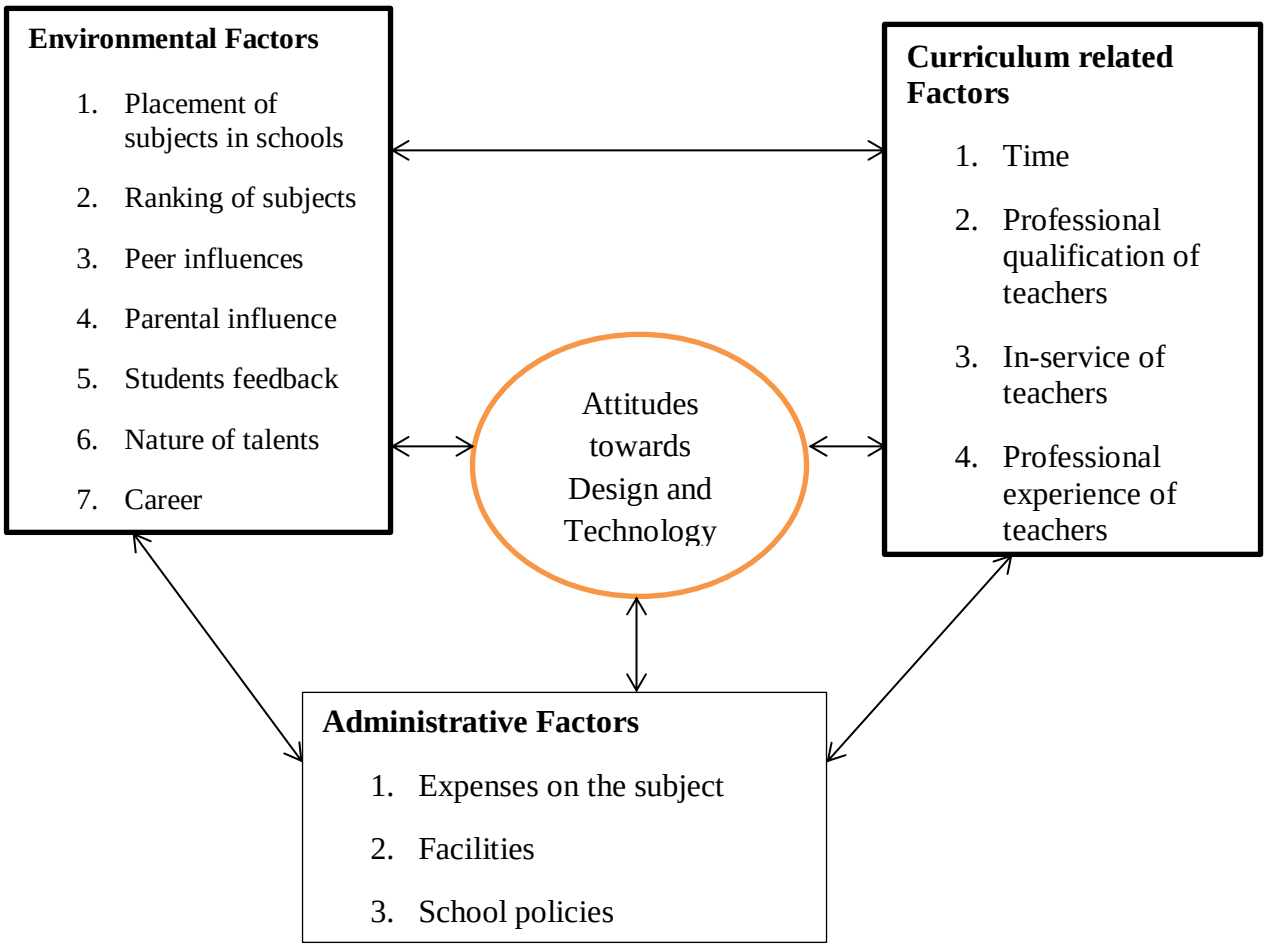
## 2.1 Introduction

This chapter provides an analysis of articles that focus on student teachers` attitudes towards Design and Technology and the impact of their attitudes on the learning outcomes. Design and Technology, having evolved from craft-based subjects, is a relatively new school subject in most parts of the world (Owen-Jackson, 2002). The short history of Design and Technology in Southern Africa and its association with notions of craft have made it an unpopular subject in schools because neither teachers nor students are familiar with it. Gaotlhobogwe, Laugharne, and Durance (2011) noted that in Europe and the United States of America (USA) 20 years ago, as in Africa today, technology education was new in the curriculum and had evolved from craft-based subjects aimed at less academically oriented students and this appeared to be the main reason why students did not perceive the subject as an important one to choose.

Becker and Maunasaiyat (2002) observed that through PATT studies around the world, it became evident that students had incomplete and vague concepts of technology. These incomplete and vague concepts would definitely affect the students' disposition towards any technology related subject such as Design and Technology. Several studies have discovered that girls had a stronger gender discrimination view related to themselves regarding technology. Growney (1995) made an observation that statistical evidence indicated that although when girls choose to engage with Technology they do well, very few made that choice. This gender discrimination view of girls related to themselves and technology related subjects has been ascribed to several factors that include; traditional attitudes of teachers; negative attitudes of parents and lack of female teacher role models (Indoshi, Wagah, & Agak, 2010).

Adeyami (2009) discusses literature that reveals various reasons why students prefer to choose some subjects relative to others. According to Adeyemi, one study in England identified enjoyment and interest; usefulness for future; and previous performance as factors that influenced students' preference to choose some subjects over others. The study further found that by contrast, the myths that students choose subjects because they are 'easy' or because of the pressure from friends, teachers, parents or from other sources seemed not to be influential.

Studies carried out in Kenya (Indoshi et al., 2010) on attitudes of students and teachers towards Art and Design which is one of the subjects in the secondary school curriculum experiencing a steady decline in enrolment of students, yielded important findings that may benefit this present study. Indoshi developed a conceptual framework illustrating the complex nature by which the emotional (for instance liking or disliking) component, the cognitive (beliefs) component, and the behavioral (tendency to act towards a subject) component of attitudes are formed and changed. Students have certain reasons why they behave in a particular manner towards school subjects. The study was guided by conceptual frame work based on theory of attitude formation and change as discussed in the works of scholars such as Eagly and Chicken (1993) as shown in Figure 1.




Source: Adopted from Indoshi et al. (2010)

Figure 1 Attitudes formation and change framework

Attitudes impel people to react to objects, situations or propositions in ways that can be called

favorable or unfavorable (Guilford, 2004). In another study, Sprinthall (1987) stressed two general sources of attitudes: external influences such as from parents, peer, teachers and students. The second general source is internal influences due to personal conflicts such as students making a choice of career to pursue. Career choice is a complex exercise involving unconscious decisions that are constrained by culture and social traditions. Environmental, curriculum and administrative related factors influencing students' and teachers' attitudes towards Design and Technology are moderated by what happens in their schools, homes, cultural norms and labour market orientations. Factors influencing attitudes may be formed due to past experiences encountered and due to ones` past behaviour and actions which may be termed as environmental influences.

Robert (2001) argues that attitude generally involves an emotional or affective component (for instance, liking or disliking) a cognitive component (beliefs) and a behavioural component (tendency to act towards these items in various ways). In other words, attitudes as described here indicate that they are strongly held beliefs, opinions and feelings, which are reflected in people's behaviour. Similarly, administrative related factors such as the school policy may demand that Design and Technology should be offered in one stream out of four streams. This may hinder talent nurturing for the learners who may not be in the stream that offers Design and Technology. If the school is not supportive in terms of facility provision and favorable learning environment, attitude development may occur towards the subject such as the number of schools offering Design and Technology declining and learners' enrolment dropping.

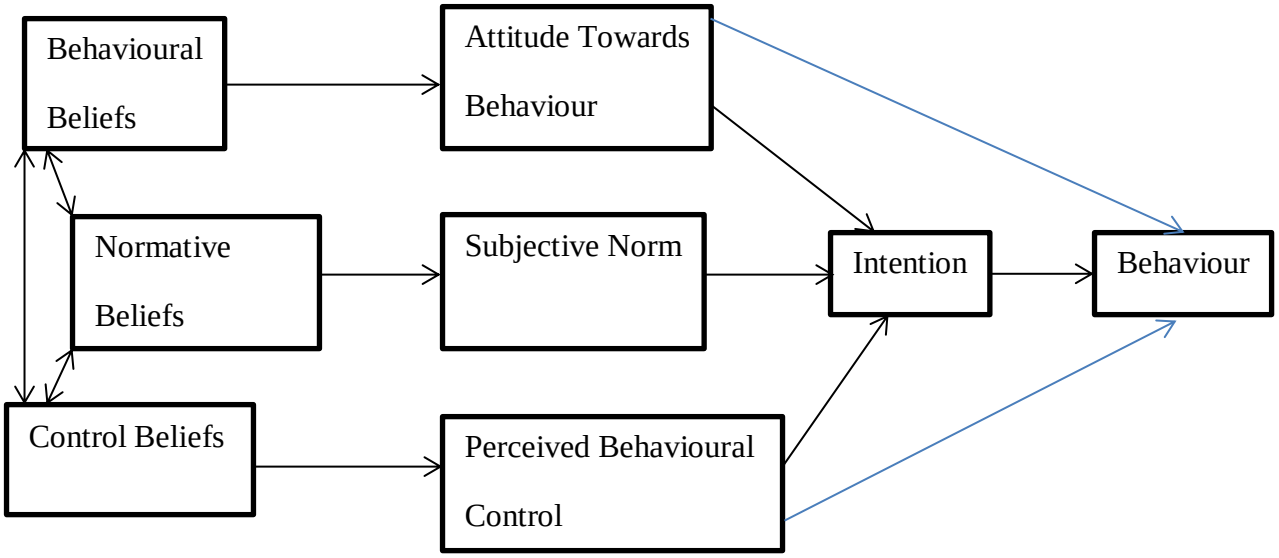
The triadic model of attitude sees attitudes as having three components, affective, behaviour and cognitive. The implication of the triadic model is that these three components form a system and are interdependent. Radford and Govier (1991), noted that a change in one component of the system should produce changes in the other components in order to maintain consistency. They further say that evidence exists that the cognitive and affective components of attitudes are closely related. The affective component encompasses our positive or negative emotions about something or how we feel about it. The behaviour component consists of a predisposition or intention to act in a particular manner that is relevant to our attitude. Finally, the cognitive component refers to the belief and thoughts we hold about the object of our attitude.

Attitudes can also take different forms, especially in the process of change. For instance, they can be selective, biased and arouse effect when challenged or resist change in the face of new experience, for example the teaching experience from teachers coupled with in-service training may lead to positive attitudes. Attitudes are hypothetical constructs, they cannot be directly observed and their existence is inferred from a person's behaviour. This behaviour can of course take many forms for example students dropping the Art and Design Curriculum and schools developing a low priority towards Art and Design (Indoshi et al., 2010).

## 2.2 Theoretical Framework

Pedagogical beliefs and students learning are influenced by philosophical and psychological perceptions about knowledge and how it is acquired. The Theory of Planned Behaviour (TPB) by Ajzen and Fishbein (2005) forms the foundation for the study. The theory attempts to predict and explain human behaviour in specific contexts. The theory of planned behaviour has three constructs proposed necessary to predict a behavioural outcome: attitudes, subjective norms, and perceived behavioural control. Perceived behavioural control is determined by the availability of skills, resources, and opportunities, as well as the perceived importance of those skills, resources, and opportunities to achieve outcomes. TPB holds that attitudes, subjective norms, and perceived behavioral control are direct determinants of intentions, which in turn influence behavior. Unlike the Theory of Reasoned Action, which is only used for behaviour under a person's control, the Theory of Planned Behaviour considers volitional control as a variable (Ajzen & Fishbein, 2005). By definition, volitional control means a person must have the resources, opportunity and support available to perform a specific behaviour.

Some research has promoted this theory as an appropriate framework to focus participant responses on their attitudes toward using technology. In essence, decision making that results in doing something or not doing something can result from attitudes and levels of motivation involved. Ajzen and Fishbein (2005) further notes that attitudes, whether positive or negative, that is constructed out of our beliefs and experiences, are primary indicators of a persons` intent to accomplish a behaviour.




Source: Ajzen, I. (2000) TPB Diagram

Figure 2: The theory of planned behaviour

The TPB has continued to be employed and adapted by researchers to predict behaviour towards technology use. For example, Venkatesh and Speier (1999) by adapting measures used in the TPB, investigated how the short and long-term effects of employee mood during new technology training influenced their motivation, intentions and usage of the new technology. Their study revealed that positive moods during training resulted in short-term increases in intrinsic motivation and intention to use the technology; however, these effects were not sustainable over a long-term. Negative moods during training resulted in decreased intrinsic motivation and intentions to use technology in the short-term and long-term, even after active use of the technology. George and Williams (2004) utilised the TPB in their investigation of planned behaviour and internet purchasing by extending the attitude towards behaviour and perceived behavioural control components to include Internet trustworthiness beliefs and unauthorised use beliefs to determine online purchasing behaviour.

## 2.3 Attitudes

Baron and Bryne (1994) contend that attitudes shape individuals` perceptions of the world and their social behaviour and feelings are found by some researchers to be linked such that people`s attitudes determine their behaviour toward objects and people they meet and influence even the relationships that exist among these with themselves. Frankfort-Nachmias (1992, p. 241) defines attitudes as:

> A mental or neural state of readiness represented by cognition, feelings and behaviour; organised through experience, deliberate learning and heredity. This exerts a directive or a dynamic influence upon an individual`s response to all objects and situations with which it is related.

Attitudes therefore have, according to Lord (1997) three elementary components namely the cognitive; the feeling or affective and the actions or behavioural components. The three are interrelated and they are always present whenever a person holds an attitude. From the foregoing definitions, it appears that attitudes are not quantifiable. They are psychological constructs, and therefore they can manifest themselves in different ways. Anderson (1985) also defines an attitude as a moderately intense emotion that prepares or predisposes an individual to respond consistently in a favourable or unfavourable manner when confronted with a particular object. It is therefore a mental state used by individuals to structure the way they perceive their environment and to guide the way in which they respond or a psychological construct comprised of cognitive, affective and intention components. Attitudes are also defined as strongly held belief that reflect people`s opinions and feelings and can be sometimes manifested in behaviour.

Chambers and Pettman (1986) have shown that both feelings and information are critical factors in the formation of attitudes and that these are critical components of understanding. In another study, Tesser (1978) defines attitudes as a hypothetical construct that represents an individual's like or dislike of an item. Attitudes are positive, negative and neutral views of an "attitude object" that is a person, behaviour or an event. People can also be ambivalent towards a target meaning that they simultaneously possess positive or a negative bias towards the attitude in question. The author further argued that, unlike personality, attitudes are expected to change as a function of experience. Christa (2001) also adds that attitudes, behaviour and feelings are found to be linked

such that people's attitudes determine their behaviour toward objects and people they meet and influence even the relationships that exist.

**2.4 Similar studies**

The literature points to a range of factors influencing young people's decision-making, including the availability of opportunities, the influence of others, family members, peers, teachers, careers officers, interest in the subjects, quantity and quality of information available about further education or training, and about the careers to which they may lead and personal factors such as self-concept, identity, enjoyment and confidence. As McGrath, Needham, and Papier (2010) stated that international studies mark social determinants in the participation rates of students in post-school education. They further mention that the major factors for non-participation in post-school education are student results and family background, which limit student options.

McGrath et al. (2010) also mentioned that in the UK, student interviews suggested that students had absorbed the idea from society that academic education was the route to follow as it offered a route to a 'profession' rather than a 'job' and that vocational education limited their options. They also had stereotypical ideas of vocational education as only belonging to a narrow range of occupations, as being all practical and being for low achieving students. A report by Dr Hou Kok Chung, Deputy Higher Education Minister said that elsewhere about 44% of students continue their education in Technical and Vocational Education and Training (TVET), but in Malaysia only 10% did that. Dr Hou further argued that such a mind set to consider TVET as second or third class education should be corrected and the ministry is actively addressing the bias. In Malaysia, skilled workers are generally associated with doing jobs with hands and not with brains. It is this belief that leads many people to regard those who do skilled types of jobs as having an inferior mental capability.

Findings by Thompson (1985) corroborated by Schumacher (1978) found that in most African countries, the lawyer, the doctor and the administrator rank highest in public esteem above the engineer and the agriculturalist, the industrialist and the trader. Even at the intermediate levels of employment, clerical occupations rank higher than technical and commercial occupations. Treffgarne (2002) also admits, well intentioned efforts to diversify the school curriculum and to produce skilled people for technical and craft occupations have tended to wither away, mainly because pupils and their parents saw vocationally biased courses as leading to dead-ends by

comparison with the academic courses which offered entry to higher education and thence, to more rewarding occupations. As a result, Wolfson (1997) adds that the status of vocational subjects and indeed of teachers responsible for teaching them, tended to remain low and to attract the lower-ability pupils and failures from the academic streams. In line with Wolfson, it is common knowledge to find our local craftsmen in Zambia when asked if they do their job out of interest but in most instances the response is that they could not continue with their education and hence opted to do carpentry.

### 2.4.1 Student teachers` Attitudes

Stenhouse (2002) has also stressed that more important than learning elementary skills, was the acquisition of certain attitudes of mind and the bases for understanding of cooperating in charge. Adding to the quantity of factual knowledge is not the problem but changing the quality of thinking very much was. Wolfson (1997) further states that these attitudes and understandings are not to be taught by adding to the curriculum isolated subjects such as elementary agriculture or building studies, but through permeating all teaching with the desired attitudes, knowledge and qualities of thinking.

Ozioma (2011) in his findings of the study revealed that factors of the items presented for analysis where proved to be factors that could influence the attitude of students towards the study of vocational and technical subjects. The level of the interest of the students in the study of vocational and technical subjects is high because the students' interests were aroused through the practical or workshops that were being carried out in the class or laboratory. But despite the fact the level of interest of the students are high, still the number of students that study vocational and technical subjects were still very few. The study also agreed that parent socio-economic status could make student develop a negative or positive attitude towards the study of Design and Technology subject. It was observed that those children whose parents were educated would not want to study Design and Technology subjects.

### 2.4.2 Parental Influence

The study further revealed that the family into which a child is born exerts a profound influence on the child's career, because his occupational life is conditioned by the child`s education which depends on the family. Payne (2003) reviewed literature on choice at the end of compulsory schooling and concluded that parents are probably the most important source of advice and help when decisions about post-16 have to be taken although advice from other family members, especially older siblings, is often valued. Moreover, Payne notes that both parental occupation and parental education affect the possibility of staying on in education after 16, and that low family income and cultural alienation may restrict young people's options. On the other hand, a parent who has missed his or her own opportunities for education may still encourage a young person to persevere and obtain qualifications.

McCrone, Morris, and Walker (2005) in their review of literature on pupil choice at 14 noted socioeconomic circumstances and parental advice had strong influence on pupils' choice of options. They also reported that young people's views varied widely on the degree of influence they attributed to their parents when they made their subject and career choices. A structuralist view would suggest that the parents have had influence long before any career decision is to be taken, by virtue of their socio-economic status and / or their own level of education, choice of school and expectations of their offspring. The study of the impact of schools Foskett and Maringe (2004) supports the view that schools with pupils of high socio-economic status will reinforce those expectations by encouraging pupils to focus on academic pathways and limit information about alternatives. Also, given the evidence of the influence of peers on career decisions discussed in the previous chapter, fellow pupils in a very academically-orientated school with parents of high socio-economic status would further reinforce those expectations, and make it unlikely that an academically successful pupil would choose a route into vocational learning.

### 2.4.3 Policy Issues

Konayuma (2008) in his presentation at the All Africa International Vocational Education and Training Association (IVETA) Conference addresses the major policy issues in Technical and Vocation Education Training (TVET) in Africa that are faced by policy makers and practitioners. This is done through study of major policy discussions in TVET Conferences such as Bureau of

the Conference of Ministers of Education of the African Union, Commonwealth Association of Polytechnics in Africa (CAPA), IVETA, Southern African Development Community (SADC) and UNESCO-UNEVOC Conferences. An analysis of TVET policies in Botswana, Kenya, Malawi and Zambia is also done. Also addressed is the current status of TVET in Africa. These include issues of gender, harmonization of TVET programmes and qualifications, linkage of TVET to the labour market, among many others. Also proposed is the importance of partnerships among various stakeholders in TVET policy formulation and implementation.

Konayuma (2008) indicates that a number of African nations have adopted TVET reforms since the 1990s. This has resulted in the formulation of TVET policies which sought to address the socioeconomic challenges faced by various nations. He cited one major concern of policy makers which is to ensure a TVET system that is relevant and accessible, while addressing issues of quality. Policy makers are aware of the critical role that TVET can play in national development. The increasing importance that African governments now attach to TVET is reflected in the various Poverty Reduction Strategy Papers, National Development Plans and Vision Papers that governments have developed.

## 2.5 Attitudes towards Design and Technology in schools

### 2.5.1 Teacher Attitudes

Further studies reveal that another important aspect very often neglected relates to teacher attitudes. Beliefs and attitudes are socially and culturally constructed, deeply seated, resistant to change, and central to our way of thinking, doing, and being (Rivalland, 2007). Beliefs are also the end result of an individual's upbringing, life experiences, and in the case of teachers, the result of socialisation processes in schools they have attended as students and worked in as teachers. Since teachers play a pivotal role in providing children with opportunities for learning, their attitudes and beliefs directly and indirectly impact upon children's developmental outcomes. It is important that teachers' attitudes are always positive because when these are, they are implicitly transferred to their learners. Such attitudes are useful to students and may for example; help bring interest, enjoyment and fun in teachers' classrooms. No two people have the same gifts, talents, abilities, interests, or emotional makeup. One of the keys to building a good self-image is to allow each student to develop his or her gifts to the fullest, giving each person the same attention and care and yet at the same time bringing out their unique talents. Therefore,

depending on the teacher's personality and their awareness of students' differences, students' success may hinge on that.

Although teachers work in teams for some things, for most of their day they work independently within their own classrooms, largely informed by their personal beliefs and theories of how children learn, despite systemic attempts to standardise curriculum using mandatory syllabus documents. It has been argued that a good teacher is the most important factor accounting for the quality of student learning (Ramsey, 2000). Classrooms with the most effective teachers are characterised by commonalties (high academic engagement, effective classroom management, and explicit teaching of skills). The authors are not suggesting that all teachers should operate in the same ways, but it is proposed that all children deserve a 'good' teacher and these children are never more vulnerable than when they are in their first year of schooling. A poor beginning can lead to frustration, avoidance, and a negative attitude towards school, while, on the other hand, early success often leads to future success and a positive attitude towards school.

Kalanda (2005) further adds that a number of studies have indicated the personality and behaviour of the teacher is very important in the formation of students' attitudes. He also states that interaction between teachers and students involves a broad range of matters that deal with personalities and methods of instruction. It is a routine to say that everyone is different. However, many beginning teachers discover, often to their disappointment, that there are some students who always seem to have problems. Their overall grades for example, may indicate that they are good students, yet in a particular course they don't seem to do well. In such a case teachers may easily forget about issues relating to students' attitudes and see the problem as merely a situation of poor performance or lack of motivation on the part of the student. Kalanda, further explains that what the teachers may not realize is that the problem may be as a result of differences in personality.

### 2.5.2 School Environment

Ozioma (2011) further states that the finding of the study also revealed that another factor that influences the study of vocational subject in secondary schools was shortage or absence of guidance counsellors in schools. This was because most schools do not have guidance and counsellors as a result most of the students that are skilful and have the abilities for the vocational and technical subjects were not counselled to study subjects that they would do better. If the

study of vocational and technical subjects were encouraged by guidance counsellors in schools, there would be a change in the learners` attitude towards that.

Spears and Costabile (2012) reports that in the United Kingdom, a paper presented on the school curriculum produced by Departments of Education and Science in 1981 attached special importance to technology. It was said that technology was parts of the preparation for living and working in a technological society. Ozioma (2011) also emphasized that Vocational and Technical Education are among the vital tools an individual can use to be developed. It is training for useful employment in trade, industries, agriculture, business and home making. The emphasis on vocational and technical education is to prepare one for self-reliance. American Vocational Association (1991) sees vocational subjects as those designed to develop skills, abilities, understanding, attitude, work habit and appreciation encompassing knowledge and information needed any workers to enter and make progress in employment on a useful and productive basis. It contributes to the production of good citizens by developing their physical, social, civic, cultural and economic competencies.

### 2.5.3 Gender role

In Botswana and in Swaziland as in many other countries in Southern Africa, there is overwhelming evidence that enrolment figures in Design and Technology are declining. The situation in Botswana is worse for girls who choose to deviate from the technological line of career as they proceed with their education (Gaotlthobogwe, 2004). The Examinations Council of Swaziland (Personal Communication, 2011) recorded a total candidature for Swaziland General Certificate of Secondary Education (SGCSE) Design and Technology of 200 girls in 2007, 120 girls in 2008, 80 girls in 2009, 50 girls in 2010 and 25 girls in 2011. In 2011, the country had only three female teachers out of about 280 teachers of Design Technology (Personal Communication, 2011). Statistics also shows declining Design and Technology female candidature for Botswana Junior Certificate Examinations (BJCE) between 1999 and 2007.

Gaotlthobogwe (2004) also indicated that girls and boys have always settled for choices that conform to family and social norms of femininity and masculinity. As discussed earlier that Design and Technology is a relatively new subject, students, particularly girls, may succumb to pressure from friends, teachers, and parents or from other sources when choosing the subject. As Ming and Volk (2003) observed that the attitudes students have about technology, whether

received through parents, peers, schooling, or one's daily life experience, play an important role in their ability to participate actively in their current and future technological world. More than just personal choice, the aggregate uptake of curriculum subjects can also have large effects on national economies and social development (Gaotlhobogwe et al., 2011).

Abeles and Porter (1978) and Delzell (1992), have demonstrated that North American children associate gender with technology instruments and that these stereotypes influence their instrument preferences. They further reported that adults view some music technology instruments as being more feminine (e.g., flute, violin, clarinet, 'cello), and others as being more masculine (saxophone, trumpet, trombone, drum). It has also been noted that young children reproduce these adult stereotypes in their attitude towards technology. Thus girls tend to prefer feminine-related technologies while boys select those that are masculine-related. Because these stereotypes limit children's opportunities to learn certain instruments, some researchers have attempted to change children's gender-typed preferences by exposing them to positive role models.

Similar studies on pupil's attitudes on technology were also conducted in Hong Kong. Ming and Volk (2003) points out that as a subject in Hong Kong secondary schools, Design & Technology is influenced by four factors. First, for many years, the subject of Design & Technology was offered almost exclusively to boys, with girls only being allowed to take Home Economics. Recently however, girls are now having the opportunity to take Design and Technology as a required subject in schools. Second, although some schools have allowed girls to take Design and Technology for several years, some have only just started this practice. As a result, some girls have studied Design and Technology from secondary one to three, while others may only be having their initial experience as a secondary three student. Third, the content and teaching of Design and Technology varies from school to school, and depends on the type of syllabus followed and facilities available. Fourth, not all secondary schools in Hong Kong offer Design and Technology, meaning a large number of both boys and girls have no experienced on the subject. Petrus (2010) mentions that the first Pupils' Attitude Towards Technology was established by Jan Raat and Marc de Vries in 1984 at the University of Technology in Eindhoven in the Netherlands. The main purpose was to assess what attitudes students had towards technology. It became evident through the PATT research that the students had incomplete and

vague concepts about technology. Research indicated that there also appeared to be great difference between boys and girls in their attitudes towards technology.

Taplin and Jegede (2001) study of gender differences among Hong Kong students noted that students' attitudes could be used to predict achievement. They used students' level of confidence in a subject as one important attitudinal variable. Educators have identified strategies found to enhance female students' confidence and success in a subject. These include changing learning materials, encouraging group activities, and reducing uncomfortable situations. Mak and Chung (1997) pointed out the differences between men and women's careers and salaries, despite perceived gains in educational opportunities. They noted that attitudes formed by women themselves and through outside society tend to reinforce factors which limit a woman's participation in non-traditional (technical) careers. Choi (1995) also raised concerns that the structure and content of Hong Kong's education system worked to reflect and uphold gender inequality in the wider society. In this regard, the formal and informal curricula, gender barriers to fields of science and technical studies, and gender bias in textbooks were seen as contributing factors to gender role acceptance and the perpetuation of the perceived "natural" differences between genders. Obviously, such critiques about education, attitudes, and employment apply to many other nations and cultures, and are not unique to Hong Kong.

Browne and Ross (1991) adds that children as young as three are very conscious of what they use and have a clear idea in their minds about which activities are for boys and which are for girls. The children were asked to sort toys into gender categories, that being which toys were for boys, for girls, and for boys and girls. The result was that the construction toys were classified as boys' toys, and toys such as dolls, felt pens and paper were girls' toys. They found that when they talked to the children about the toys the children responses clearly indicated that they understood gender to be a way of organizing people and society. Because the proportion of students in natural, computer, and technological sciences has sunk dramatically in Lesotho, there are now various educational programs to increase the attractiveness of these subject areas. Our Cultural heritage plays a part in determining student attitudes which may affect female student teachers proceeding with subjects like Metal work and Woodwork. For instance in Zambia our cultural norms especially in the olden days would not allow boys to perform chores that were meant for girls and the same applied to girls who would most of their times be confined with their mothers.

Having grown up with such a belief, student teachers are still conforming to many traditional gender stereotypes.

## 2.6 How do School Managers or Principal and Teachers influence learners` attitudes towards Design and Technology.

### 2.6.1 Teachers` role

According to Kalanda (2005) a role is essentially a set of expectations imposed on a person by others; in this case it could be parents, society, students or school curriculum. The teacher's role is also described as subject specialist, classroom director, as employee and curriculum implementer. In other words, a teacher needs to be in the role of a coach, acting as a mentor, assistant and collaborator who, with a blend of empathy, compassion and fun, guides and instructs. The role of a teacher is assumed to be the essential link in the relationship between the teacher's functions and learner's behaviour and attitude. Studies have indicated that teachers play a major role in what happens in their classrooms. Teachers provide leadership and guiding role in the teaching and learning context and therefore are extremely influential.

Although teachers work in teams for some things, for most of their day they work independently within their own classrooms, largely informed by their personal beliefs and theories of how children learn, despite systemic attempts to standardise curriculum using mandatory syllabus documents. One reason put forward by Ramsey (2000), reveals that a good teacher is the most important factor accounting for the quality of student learning. In another study Darling-Hammond (2000) also stressed that Classrooms with the most effective teachers are characterised by commonalties such as high academic engagement, effective classroom management, and explicit teaching of skills. He further states that a poor beginning for students` can lead to frustration, avoidance, and a negative attitude towards school while, on the other hand, early success often leads to future success and a positive attitude towards school. This means that the teacher has to diagnose students' prior knowledge before bringing in new knowledge. As a Facilitator, the teacher has to structure learning in such a way that good learning experiences are brought to the fore. This is done by organizing activities that help students to actively participate

in their own learning. The interaction between teachers and students involves a broad range of matters that deal with personalities and methods of interaction.

### 2.6.2 Teachers` personality

Lubeya (2012) observes that another important aspect often neglected relates to teacher personality. Studies have indicated that the personality and behaviour of the teacher is very important in the formation of student attitudes. It is important that teachers` attitudes are always positive because when these are, they are implicitly transferred to the student teachers. Such attitudes are useful to students and may assist in developing interest and in the end motivate the student teacher in class. Lubeya (2012) identified and summarized the role of the high school administrators and teachers that they have a major role to play in as far as practical subjects are concerned. She suggests that teachers should work hard and improve their competencies in handling practical lessons so as to develop confidence in the pupils. She further states that teachers should not neglect the pupils who stay away from lessons but encourage them as much as possible to reach the final stage of examinations. Furthermore, administrators are encouraged to emphasize to the pupils the importance of these practical and technical subjects in the curriculum and their benefits for self-employment. Practical and technical subjects should also be given a considerable emphasis just like language, mathematics and science.

Nkonde (1989) outlines factors like administrators, immediate supervisors, parents and teachers as contributing factors to attitudes towards Design and Technology. He further revealed that administrators have an important role to play in the improvement of Design and Technology. Nkonde further states that the problem may not be with the learner but the supervisors who have ignored the importance of practical subjects and consider subjects like Mathematics, English, and Science more than Design and Technology. The researcher agrees with Nkonde, where in some schools administrators have hired people outside the school to repair school furniture instead of utilizing the Design and Technology department. The activity of furniture repairing would greatly benefit the school where the student would acquire skills and in the process maintaining school furniture. The school would as well save on their financial resource they would pay a contractor and use it on other areas of need.

### 2.6.3 Teaching and Learning methods

Furthermore, learning methods also affect how effectively students process information, as each learner receives information differently. With respect to learning styles, it has been reported that student who engaged in meaningful learning performed considerably better and had more positive attitudes than those who were rote students. This is an important finding because it suggests that teachers need to help student teachers' in a manner that would enhance their life-long learning skills. Students are not all alike. Each one sees the world in a way that makes the most sense to them. Such individualized perceptions shape what students think, how they make decisions, and how they define what is important. The perceptions also determine student teachers' natural learning strengths, or learning styles. It is vital therefore for teachers to deliberately use a variety of methods to reach individuals. As Mohammad (2009) adds that the successful implementation of this curriculum transformation depends on the ability of teachers to improve teaching and learning methods in the classroom to encourage objective thinking among students.

The emphasis on the teacher involves not only an emphasis on the personal traits of the individual, but also considers the philosophy of education and other matters involving educational psychology and learning principles. The purpose of dealing with different teaching techniques is to acquaint the students with the variety of tools available to them for solving problems related to instruction. The teachers generally set short and long term goals of what is to be achieved in their classrooms. These goals include both cognitive and affective objectives.

## 2.7 Chapter Summary

Literature revealed that various people in different countries have done research on the attitudes of people, students and learners towards technical and vocational subjects. Literature points to the fact that learning experience may be influenced by factors such as self-concept, parents, teachers, environment, socio-economic status, objects, and situations. Literature also alluded to the fact that the first Pupils' Attitude Towards Technology was established at University of Technology in Eindhoven in the Netherlands to assess what attitudes students had towards technology. There appeared to be great difference between boys and girls in their attitudes towards technology. Their conclusion and subsequent recommendations supported the earlier charge that technology should be available to all students, regardless of gender. The present study

was also to establish whether such findings would be applicable among student teachers at Chalimbana University in Zambia.

# CHAPTER THREE

# METHODOLOGY AND RESEARCH DESIGN

## 3.1 Introduction

The following section presented the process of information gathering and means of analysis according to the purpose. This chapter gave an indication of what was done to achieve the goals of the study. The purpose was to examine student teachers` attitudes towards Design and Technology, causes of student teachers` attitudes toward Design and Technology, the role of school managers or principals and teachers regarding student teachers` attitudes towards Design and Technology and subsequently what ought to be done to improve student teachers` attitudes so that Design and Technology could be made popular to the would be students. In a similar study towards technology, Boser, Palmer, and Daugherty (1998) pointed out that measures of students attitudes towards technology may provide some insight into the teaching approaches that affect student teachers' attitudes towards technology in a positive way. The attitude measure may then be one indicator of effective teaching approaches for Design and Technology. In this regard, the chapter described the research design, explained the population, sample, sampling technique, describe the procedure used in designing the instrument and collecting the data, provide an explanation of the procedures used to analyze the data and ethical issues.

## 3.2 Research Design

According to Ghosh (2003) a research design is the arrangement of conditions for collecting and analysis of data in a manner that aims to combine relevance with research purpose; it is the conceptual structure within which research is conducted. Orodho (2003) also defines research design as the scheme outline of the plan that is used to generate answers to the research problems.

Ngoma (2006) adds that a research design is the set of logical steps taken by the researcher to answer research questions. Ngoma further explains that it is the blue print or recipe for the study and determines the methods used by the research to obtain participants, collect data, analyse the data and interpret the results. In this study, the researcher employed methodological triangulation. Methodological triangulation, according to Taylor, Kermode, and Roberts (2007) involves using two or more research methods in one study at the level of data collection or design. In this study two research strategies namely qualitative and quantitative were employed. Quantitative data

involved the use of closed-ended questionnaires where the researcher asked all participants identical questions in the same order to allow for meaningful comparison of responses across participants and study sites.Qualitative data involved open-ended interviews where respondents were interviewed to express views on particular experiences.

A sequential explanatory design was used typically to explain and interpret quantitative results by collecting and analysing follow-up qualitative data. This strategy is useful especially when unexpected results arise from quantitative data. In this case the qualitative data collection that followed was used to examine unexpected results in more detail. The advantage of this strategy is that it is easy to implement because the steps fall into clear and separate stages. In addition, this design feature makes it easy to describe and report. As Schneider, Elliot, LoBindo-wood, and Haper (2003) adds that complementary findings in a study make a more valid contribution to theory and knowledge development, enhance diversity, and enrich the understanding surrounding the study's objectives and goals.

### 3.3 Population and Sample

Ng`andu (2013) states that a population is a group of individuals, objects or items from which samples are taken for measurement, for example a population of students. Population refers to entire group of persons or elements that have at least one thing in common, for instance students at a University. Oso and Onen (2009) adds that target population refers to the total environment of interest to the one carrying out research. A population can be very general (all human beings) or very narrow (all male beings aged 25 years old) but in either case researchers rarely, if ever, have access to every member of the population. In virtually every case, sample participants are drawn from the population. The population of the study comprised students studying Design and Technology at Chalimbana University.

Bless and Higson-smith (1995) point out that sampling is a technical device to rationalise the collection of information, to choose in an appropriate way the restricted set of objects, persons and events. Phiri (2006) also adds that a sample is a finite part of a statistical population whose properties are studied to gain information about a whole. For purposes of this study, the population of 60 students were taking Design and Technology. All the 60 students taking Design and Technology participated in the study. A number of 50 respondents completed the questionnaires whilst 10 respondents were interviewed. The student teachers were those

registered for studies leading to a Diploma in primary education and Diploma in secondary education respectively.

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**Instrumentation**

This study used self-completion questionnaires and semi–structured interviews because they helped provide a wide coverage of target groups from whom data was collected. The quantitative phase comprised a questionnaire (see Appendix 1) which was largely made up of close-ended questions. All respondents were given a questionnaire by the researcher at the same time at Chalimbana University. The researcher personally collected the questionnaires in order to increase on the rate of return of the instruments.

The qualitative phase involved interviews (see Appendix 2), which comprised open-ended questions in which ten respondents participated. Guest (2006) recommended a sample size of between six and twelve participants if the selected group is homogenous. This sample size allowed objectives of a study to be realized. Therefore, a target goal of ten total participants from the Primary Teachers` Diploma and Secondary Teachers` Diploma was used for the interview. Interviews were conducted in lecture rooms. This was intended to allow respondents to feel free in a familiar environment rather than, say, the researcher's office, which could be intimidating. Procedures were clearly explained to all the interviewees and they were allowed to ask any questions that were of concern to them. Based on the questions, the researcher assured students that any information provided would only be used for research purposes and that such information would not affect their academic work.

**3.5 Data collection**

The study used two data collection method for collecting data to answer the research questions. The quantitative phase used a questionnaire which was administered collectively in a classroom environment in order to ensure a high response rate from respondents. Closed ended questionnaire were used for the data collection purpose. According to Oso and Onen (2009) The general advantage of questionnaire method over other data collection methods was that information was collected from larger sample. The other advantage of closed ended questions was that time of respondent was saved and the management of data was much simpler.

In this study, a qualitative phase conducted semi-structured interviews with the student teachers at Chalimbana University. The semi structured interviews were used in the research in order to probe not only what individuals say, but also what they believed to be true about a subject. In the semi-structured interview, new questions were asked in order to gather more specific details and answers. Frey, Botan, and Kreps (2000) observes that the face-to-face interview method used enable the researcher to ask in-depth questions to better receive more exhaustive answers.

### 3.6 Data Analysis:

To produce significant, detailed results, it is necessary for the collected data to be analyzed in a methodological manner (Attride-Stirling, 2001). Therefore, the researcher had to ensure that each interview was audio-recorded and fully transcribed in written words, coded and analyzed in form of themes while quantitative data were presented in frequencies, percentages, tables and charts. The presentations of the results were presented in relation to the research questions in order for the researcher to make informed judgment about each research question.

### 3.7 Ethical issues

Research ethics is a major issue that governs research activities. Research ethics deals primarily with the interaction between researchers and the people they study. It is about specific principles that make provision for a generalised framework and policies about how research should be done. Cooper and Schindler (2008) indicated that the research design must be free of physical harm, discomfort, pain, embarrassments and the loss of individual privacy; also there are specific procedures and behaviour patterns to adhere to during the research process. Agreed-upon standards for research ethics help ensure that researchers explicitly consider the needs and concerns of the participants, that appropriate oversight for the conduct of research takes place, and that a basis for trust is established between researchers and study participants.

Throughout the research process, the highest ethical standard and accepted level of sensitivity were employed at the time of interacting with the research respondents. Critical measures were instituted to provide them with adequate information about the project, what was be expected of them how their anonymity was assured, as well as assuring them that the information they provided which was treated in confidence, and that they had the right to withdraw from the process at any stage.

### 3.8 Chapter Summary

The purpose of this study was to examine the attitudes of student teachers towards Design and Technology at Chalimbana University. The target population for this study were student teachers at Chalimbana University in Chongwe area of Lusaka Province in Zambia. The research sample consisted of 60 respondents enrolled at Chalimbana University for Diploma in primary education and Diploma in secondary education. The questionnaire was administered collectively in a classroom environment in order to ensure high response rate from respondents. Interviews were conducted in lecture rooms. This was intended to allow respondents to feel free in a familiar environment. The data was analysed using interviews which were audio-recorded and fully transcribed in written words, coded and analyzed in form of themes while quantitative data were presented in frequencies, percentages, tables and charts.

# CHAPTER FOUR

# RESULTS

## 4.1 Introduction

This chapter presents results to answer research questions. The qualitative data were summarized using interview transcripts generated from a coding phase and organised into themes while quantitative data were presented in frequencies, percentages, tables and charts. The presentations of the results were presented in relation to the research questions in order for the researcher to make informed judgment about each research question. To achieve goals of the study, results examined the attitudes of student teachers towards Design and Technology, factors influencing their attitudes toward Design and Technology, and the role of school managers or principals and teachers regarding the perception of student teachers towards Design and Technology.

## 4.2 Student Teachers' Attitudes towards Design and Technology.

The first research question was aimed at finding out student teachers' attitudes towards Design and Technology. The researcher gathered the evidence from students' responses, through self-administered questionnaires and semi-structured interviews.

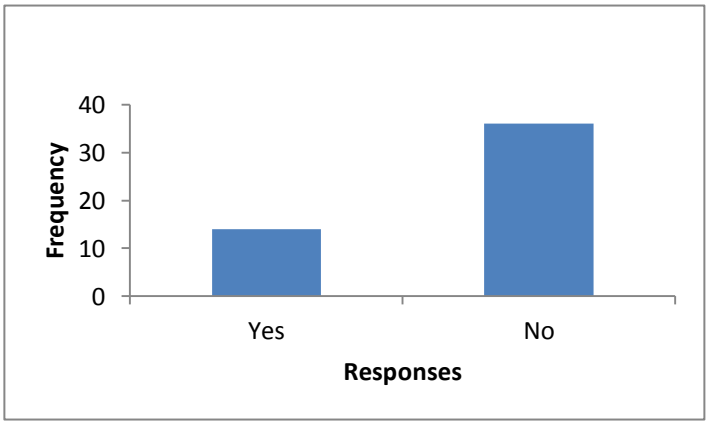


Figure 3: Equal treatment of Subject

Results on the bar graph indicate that 36 respondents representing 72% disagreed that subjects are treated equally while 14 respondents representing 28% agreed that Design and Technology subjects are treated equally. Results show that the subjects are not treated equally. Similarly, respondents interviewed revealed on the subject treatment had this to say:

> Design and Technology has minimum periods on the timetable as compared to other subjects like mathematics. (Respondent 3)

> We don`t finish projects in woodwork and metalwork due to limited time allocated for Design and Technology (Respondent 3)

> Other departments like science have enough rooms for their practical and materials and equipment are available most of the times. (Respondent 4)

> Departments like Mathematics and English have enough members of staff; it is not the case with Design and Technology. (Respondent6)

> The metal workshop is too small to accommodate one group of Design and Technology. (Respondent 5)

To learn more about student teachers' attitudes, the researcher interviewed participants if boys found it easier to learn Design and Technology as compared to girls. Respondents revealed that:

> It takes ones` understanding and how you take it, the way you feel about doing it, so I think what a man can do a woman can do it even better, because when doing metal work with boys I interact with them, I ask them on how to go about things, so I find it more interesting. (Respondent 1)

> On that one I would say that it depends on the interest of the person and the mind-set, because people think subjects like Woodwork and Geometrical and Mechanical Drawing are meant for boys and that girls are not supposed to be taking such (Respondent 2)

In contrast, one interviewee who participated had this to say:

> On that one, it is true because boys like doing practical subjects whilst girls enjoy subjects to do with reading and writing. (Respondent 3)

Furthermore, the researcher also posed questions during the interview to learn more if people that are good at mathematics found it easier to do Design and Technology. Some respondents had this to say;

Yes it is because Design and Technology involves some calculations which are also common in mathematics. So when one is good at mathematics, they will find it easier to do Design and Technology. (Respondent 2)

Somebody needs to be sharp, somebody needs to imagine and think not just inside the box but beyond (Respondent 1)

On that I don't think so, its` just a matter of interest, if you have the interest even when you are not good at mathematics you can do it (Respondent 3)

Results indicate that respondents agreed that people who are good at Mathematics find it easier to do Design and Technology. Meanwhile, respondents were asked if Design and Technology was easy.

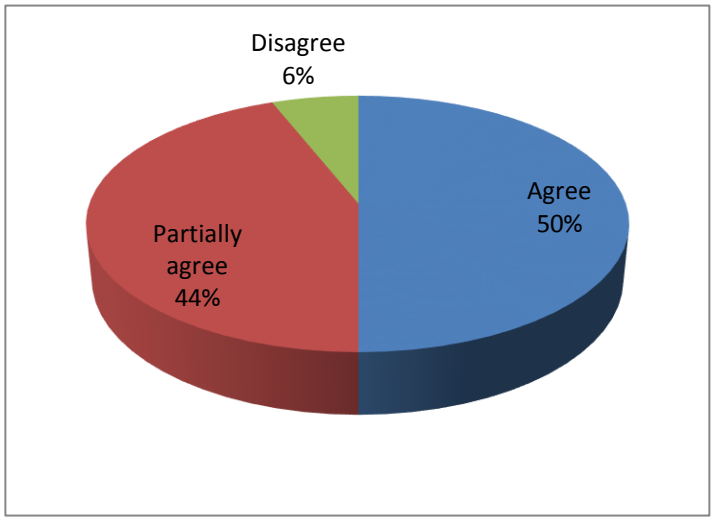


Figure 4: Design and Technology is easy to Student Teachers

From the pie chart above, it was observed that 25 respondents representing 50% agree that Design and Technology is easy, 22 respondents representing 44% partially agreed while 3 respondents representing 6% disagree that Design and Technology is easy. On the other hand one respondent interviewed stated that;

When you are just learning without hands on, it is a very difficult and so complex (Respondent 1)

Results show that the highest percentage of respondents agreed that Design and Technology is easy, in contrast Design and Technology is very difficult when you are learning without practice.

### 4.3 Causes of student teachers' positive or negative attitudes towards Design and Technology.

The second research question was aimed at finding causes of student teachers' positive or negative attitudes towards Design and Technology. Both quantitative and qualitative methods of collecting data and analysing were employed in order for the researcher to gather responses for the research question.

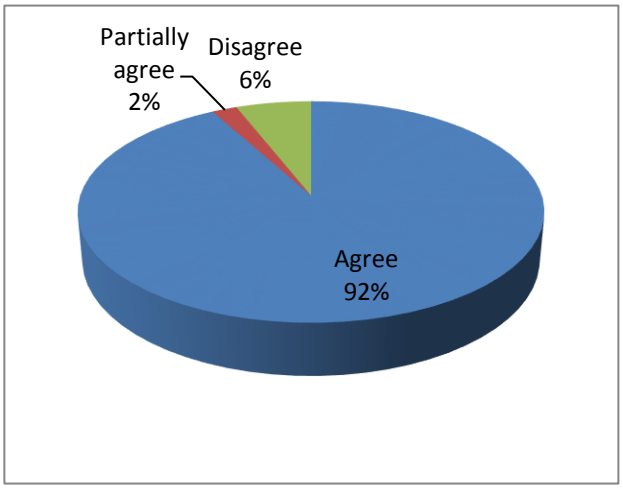


Figure 5: Student Teachers like Design and Technology

The pie chart illustrates that 46 respondents representing 92% liked Design and Technology, 3 respondents representing 6% disagreed while 1 respondent representing 2% partially agreed. An overwhelming majority of respondents like Design and Technology.

One of the respondents interviewed expressed the desire to continue with Design and Technology because of the background knowledge he had:

> I used to do Industrial Arts at junior and secondary schools. I like the subject because am building on what I learnt at school (Respondent 2)

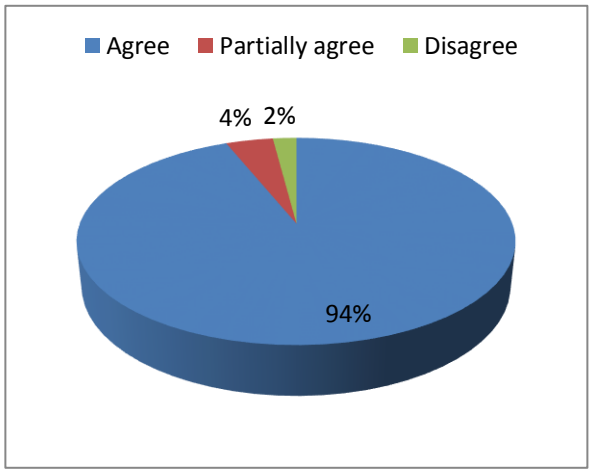


Figure 6: Student Teachers interest in Design and Technology

The pie chart above shows that 46 respondents representing 94% of the respondents interested in Design and Technology while 2 respondents representing 4% partially agree. 1respondent representing 2% have no interest in Design and Technology.

Most of the respondents talked to agreed they had interest in Design and Technology because of the benefits attached. One interviewee had this to say:

> One of the interesting things in Design and Technology is about production of items in the workshop. I wanted to make something unique one day so that people would say this is the first of its kind (Respondent 1)

However, one respondent did not agree that Design and Technology is interesting:

> I don't like some components that are integrated in Design and Technology because I am not interested especially being in the workshop with the dirty stuff (Respondent 5)

Similarly, respondents were asked to state the benefits of taking Design and Technology.

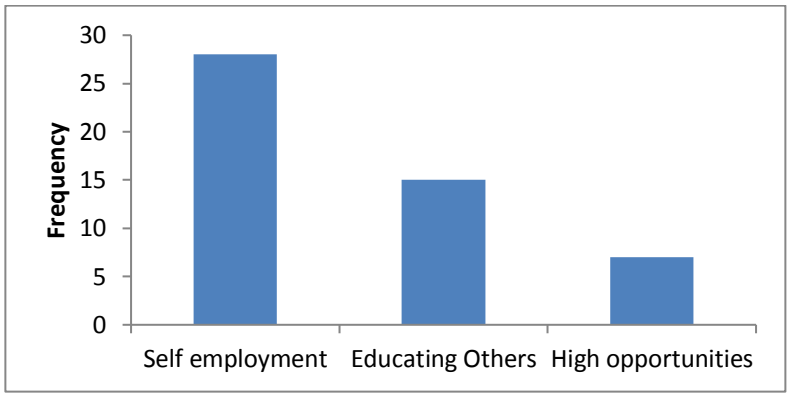


Figure 7: Benefits of taking Design and Technology

In the bar graph, 28 respondents representing 56% said the benefits of taking Design and technology course was self-employment, 15respondents representing 30% said the benefits of Design and Technology was educating others while 7 respondents representing 14% stated high opportunities as benefit for taking Design and Technology.

Furthermore, other respondents interviewed discussed the benefits of Design and Technology:

> The benefits are that I can work for myself, for instance, I can fix pot handles, screw tables at home instead of taking them for repair to a carpenter. I have a skill that can sustain me apart from being a teacher (Respondent 4)

> The benefits are that, it is a life skill which I would continue doing even when I retire. (Respondent 6)

> It is a subject that one can benefit after dropping out of school, may be in grade 7 or others can stop in grade 9. These pupils can have the knowledge of making things which can give them income (Respondent 3)

> When I acquire the skills at the end of the course, I will be able to open my own work shop. (Respondent 4)

Others whose benefits focused on educating others could still point to gains in skills and knowledge which they would later transfer to the learner:

I think the main benefit of taking Design and Technology is to impart knowledge to others so that they can also be self-reliant (Respondent 5)

I will be able to teach the skills I have learnt to the learners with confidence. (Respondent 2)

Others again said the course simply created High Opportunities for them since Zambia, as a nation has had few Design and Technology teachers**:**

It helps one with career or work opportunities because there are few Industrial Arts teachers (Respondent 3)

I feel I will be marketable as a teacher since there are very few teachers who have done this course (Respondent 2)

I feel that there is no competition for job opportunities because there are few Industrial Arts teachers in Zambia (Respondent 6)

Respondents agreed that taking Design and Technology created career prospects where they would be in demand especially that Zambia has had a few Design and Technology teachers. Similarly, respondents were asked if Design and Technology was marketable.

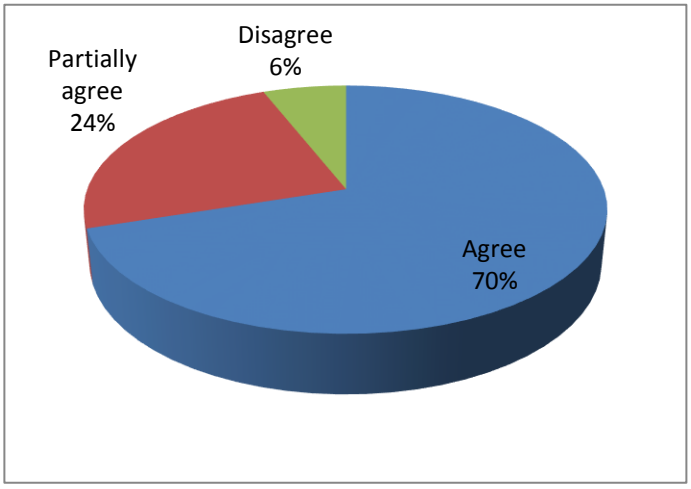


Figure 8: Available market for Design and Technology

In the pie chart 35 respondents representing 70% agreed that they would easily get work after graduating, 12 respondents representing 24% partially agree that they would get work while 3 respondents representing 6% disagree that they would get work after graduating. Most of the respondents indicated that they would easily get work after graduating.

One of the participants mentioned the benefits of taking Design and Technology. She stated that:

> Sometimes you are not employed by the government or a company; you can earn a living with the skill acquired in Design and Technology. You can be self-employed because whatever you learn in class you can use it elsewhere. (Respondent 2)

Furthermore another interviewee had this to say on the benefits:

> One of the benefits is solving lifetime situations. For instance you may have situation where you do not have chairs, you would make your own chairs and solve the problem at hand. (Respondent 3)

One of the respondents even expressed the desire to open an internet café from the knowledge acquired from Information and Communication Technology (ICT) which is one of the components in Design and Technology, she said:

> I will open my own internet café and I will earn a living from that, besides earning a living I will also create employment for others because I will need people to work with at the café. (Respondent 4)

Similarly, other participants discussed career prospects of Design and Technology subjects.

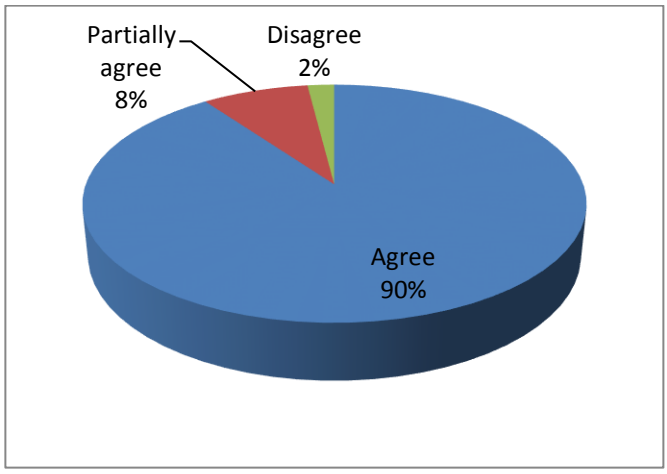


Figure 9: Good career

Results on the pie chart indicate that 45 respondents representing 90% consider having a good future career in Design and Technology, 4 respondents representing 8% partially disagree. However, 1 respondent representing 2% does not consider a good future career in Design and Technology.

Respondents had this to say:

> When I finish my training I will open an internet café where I will create employment for myself and others (Respondent 1)

> I will open my own workshop in case the government does not employ me, I will earn a living and sustain my family (Respondent 5)

Results indicate that learners consider the apparent usefulness of the subject to future careers and jobs.

Furthermore, respondents were asked about their expectations after taking Design and Technology.

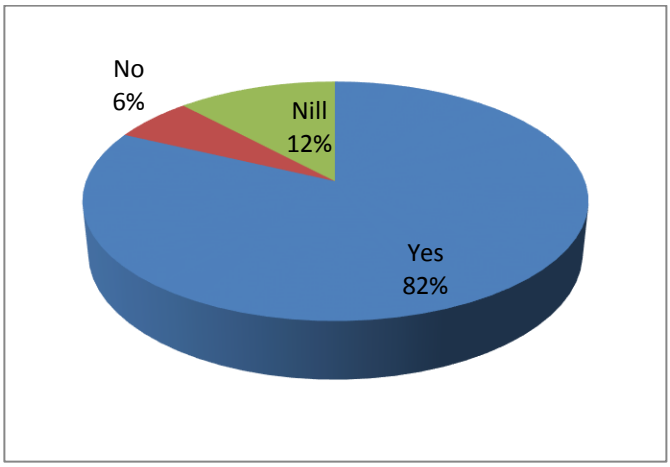


Figure 10: Design and Technology expectations

Results on the pie chart above indicate that most of the respondents agreed that their expectations were met. 41 respondents representing 82% feel that their expectations have been met, 3 respondents 6% feel that their expectations have not been met. The other 6 respondents representing 12% did not respond to the question.

The researcher asked interviewees on their expectations. The respondents had this to say:

> So far I would say very well because despite learning the methods and terms used I have found it to be good and changing in the way I look at things around me, for instance what it takes for someone to draw an engine bolt on paper (Respondent 6)

> After learning the subject for one year am able to fix electrical components like plugs and sockets at home (Respondent 4)

Findings reveal that the expectations of the respondents are high due to the future benefits. More negative comments were relatively rare, issues of safety, non-practical work and issues of subject organization which was rather bulky according to their responses.

> When you are just not careful with the safety precautions you can injure yourself (Respondent 5)

> It takes some time to understand because its` my first time learning Design and Technology (Respondent 4)

There is more theory work as compared to practical and this makes the course difficult for me to understand certain concepts. (Respondent 6)

Sometimes the assignments are a lot, in a way that when you are given an assignment before you even know that what you did was correct or wrong, you are given another. We need feedback in order to build on previous work. (Respondent 1)

When you are just not careful with the safety precautions you can injure yourself and cause permanent disability to your body. (Respondent 2)

With the integration of the five components as compared to the previous three components, Design and Technology has become bulky such that there is a lot of work to do in terms of assignments. (Respondent 2)

The responses above were highlighted more when respondents were asked about challenges they faced in the learning of Design and Technology. The results were indicated in the bar graph below.

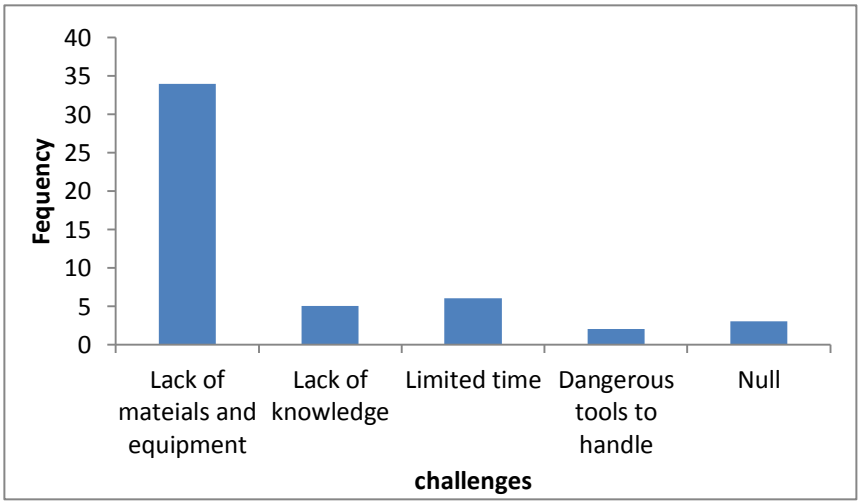


Figure 11: Challenges faced in studying Design and Technology

The bar graph above indicates that 34 respondents representing 68% of the respondents indicated lack of materials and equipment, 5 respondents representing 10% indicated lack of background knowledge, 6 respondents representing 12% stated that time allocated to learn practical lessons

was insufficient, 2 respondents representing 4% said that the workshop had dangerous tools to handle while 3respondents representing 6% did not respond to the question.

The researcher further interviewed respondents on what challenges they faced in Design and Technology. The following were the responses:

> Sometimes material for use is not readily available so you have to buy your own. Materials for Design and Technology are expensive. (Respondent 3)
>
> Lack of tools to use which lead to the use of wrong tools (Respondent 6)
>
> Lack of back ground knowledge. Meaning lack of basic knowledge but I just have interest. (Respondent 4)
>
> The challenges I face are that some tools are dangerous to handle and working in the workshop is sometimes tiresome but with interest you can do it. (Respondent 6)

The study results showed that learners had challenges which included; lack of materials and equipment, lack of knowledge, limited time for practical, dangerous tools to handle among other challenges.

### 4.4 How do School Managers or Principals and Teachers influence Student Teachers' Attitudes towards Design and Technology?

The third research question intends to find out the role of school managers or principals and teachers influence student teachers' attitudes towards Design and Technology. Both quantitative and qualitative methods of collecting data and analysing were used to answer the research question.

Table 2: Student Teachers' advisor for taking Design and Technology

| | Frequency | Percent |
|---|---|---|
| **teachers** | 14 | 28.0 |
| **family** | 21 | 42.0 |
| **friends** | 12 | 24.0 |
| **other** | 3 | 6.0 |
| **Total** | 50 | 100.0 |

The above table shows that 21respondents representing 42% of the respondents were advised by their family, 14 respondents representing 28% were advised by teachers, 12 respondents representing 24% were advised by friends while 3 respondents representing 6% did not respond to the question.

Results show that a bigger percentage of 42% were advised by the family. It is clear that teachers did not play a major role in as far as interacting with learners on the value of Design and Technology.

Results from the questionnaire reveal that subjects in the curriculum are not treated equally.

Respondents were further asked to respond to follow-up question that required them to explain on their response in figure 12. The researcher wanted to find out the views of the respondents on why they felt subjects in the curriculum where treated equally or not. Respondents revealed the following:

> Other departments like science have enough rooms for their practical and materials and equipment are available most of the times. (Respondent 6)

Respondents interviewed revealed various criteria used to allocate them into Design and Technology classes by the institution: They had this to say:

> I was forced to take the course regardless of my background; I never did Industrial Arts at school. (Respondent 6)

> When I first reported, I was in a group that was split into two optional subjects namely Expressive and Design and Technology because Home Economics class was full. That is how I found myself doing Design and Technology (Respondent 2)

> To be honest, I wasn`t even ready for Design and Technology, I wanted to do mathematics simply because I like it. I was not accepted to do mathematics and that is how I decided to do Design and Technology (Respondent 1)

> I applied for Design and Technology and I was accepted. I did Industrial Arts at school and this is interesting because I want to learn more and more (Respondent 2)

Respondents interviewed on the influence of Administrators/Teachers on Student teachers' attitudes towards Design and Technology. The following responses were given**;**

> To sensitize parents and pupils that Design and Technology is an easy and enjoyable subject. It is also for girls and not only boys. (Respondent 1)

> The workshop building must be increased in size to accommodate learners when doing their projects. (Respondent 4)

> The institution should focus at least more on us just like other subjects. (Respondent 3)

> Facilities are not enough in institutions of learning, administrators should consider training and retraining more teachers in the area to address the shortage of staff in Design and Technology (Respondent 2)

The fact that respondents have identified lack of materials and equipment, lack of knowledge and limited time, low staffing levels among other challenges, this may be an indication that teachers and administrators need to change and accept the major role Design and Technology play in the development of survivor skills of individuals and the nation at large.

## 4.5 Chapter Summary

This chapter provided results in relation to Student teachers' attitudes towards Design and Technology. Findings from the study suggest that Design and technology remains one of the most exciting areas of study that is in touch with every aspect of human nature. It is this responsibility that Design and Technology carries that makes it a priority area of study. However, the lack of material and equipment appears to be a major obstacle to the development of this important area of study. Findings also noted the comprehensiveness of the subject content and the lack of time to complete the syllabus within the given time. Results of this study have shown that lack of resources play a major role in influencing student teachers' against the subject. With respect to gender differences, the study's findings reveal that gender stereotyping of girls, has negatively influenced their attitudes toward Design and Technology. However, despite the challenges of materials and equipment, some respondents took it upon themselves to take Design and Technology.

# CHAPTER FIVE

# DISCUSSION

The main purpose of the study was to explore student teachers` attitudes towards Design and Technology. The general findings of the research indicated that students had positive attitudes towards Design and Technology; they generally had a limited concept of Design and Technology. Students often perceived Design and Technology as a new phenomenon which was assumed as products like computers and home appliances and students did not recognize it as a process. Findings suggests that students` attitudes towards Design and Technology was attributed to various determinants or predictive characteristics such as gender roles, school environment, interest, career aspirations, Resource availability and parental influence.

## 5.1 Student Teachers' attitudes towards Design and Technology

### 5.1.1 Gender

With respect to the first research question Gender was one of the determinant or predictive characteristic that influences student attitudes. This study highlighted gender as having a more influential effect on students` attitudes in terms of importance, level of difficult and satisfaction. Results from the respondents interviewed show that male students tend to rate the teaching of Design and Technology more positively than the female student. This supports and adds to the findings from studies examining gender issues whose results indicated that boys had more positive attitudes towards technology than girls did (Ardies, De Maeyer, & Gijbels, 2013) . The researcher asked participants if boys found it easier to learn Design and Technology as compared to girls. One respondent acknowledged that boys like doing practical subjects whilst girls enjoy subjects to do with reading and writing.

In the review of Barmby, Kind, and Jones (2008) boys are generally found to be more positive than girls and with less negative trend in the development of their attitude. It also appears to be the case in Botswana and in Swaziland as in many other countries in Southern Africa where there is overwhelming evidence that enrolment figures in Design and Technology are declining. Gaotlhobogwe et al. (2011) reported similar results that girls` attitude towards technology were generally less positive than boys. Literature further indicated that girls and boys have always

settled for choices that conform to family and social norms of femininity and masculinity. Patterns of girls' attitudes towards Design and Technology in Botswana and Swaziland are somewhat similar, indicating that the two countries could collaborate in efforts to promote participation of girls in this subject. These results indicate that the amount of support provided, or not provided, by parents, siblings and teachers influence these girls' attitude towards the subject in both countries.

So the limited numbers of girls enrolling in Design and Technology in both countries is a sign that these girls do not get much support or encouragement to do so from all whose support matters. Potentially, the enrolment of girls in Design and Technology could be reinforced by promoting the subject to the public and by ensuring that girls get much social support to alleviate potential obstacles. This supports and adds to the findings of Lin, Wen-hui Tang, and Feng-Yang (2012) who also showed results in a study in which women felt helpless and oppressed within their families in terms of using Information and Communications Technology. The authors report that the absence of support and help from families, and the constraints these women experienced in using their home computers, hindered their ICT learning although they recognized its importance in the modem world and were willing to learn, the lack of support from family members left them feeling anxious and helpless. Some studies have shown that parental involvement and attitudes are often correlated with students` attitudes towards science. Otto (1991) found that mothers in particular view science as unsuitable for females, thereby contributing to their daughters` negative attitude towards science.

Exceptions to these findings were noted with results indicating that gender was not an obstacle to undertaking a technological career. One of the respondent who was the only female doing metal work stated that what a man was capable of doing a woman could do it even better. She further said that taking Design and Technology was interesting. Even with the challenges of materials and equipment the respondent took it upon herself to take Design and Technology. There is evidence that the positive attitudes by the students could be attributed to the prevailing background knowledge. On the other end, students' negative attitudes could be attributed to poor facilitating conditions or environmental factors. This highlights that there is still some work to be undertaken to ensure gender equality in the areas of Design and Technology.

The more females take up technology related jobs and increase female role models, the more the subject will be perceived as important, and then the attitudes will be influenced positively by environmental factors, as depicted in the attitude formation framework. Forde, Kane, Condie, McPhee, and Head (2006) remind us that the Equal Opportunities Commission (1998) reported clear gender stereotyping in the uptake of occupations recorded in the Scottish School Leavers Survey that worked to the disadvantage of women and girls. The lack of women and girls pursuing nontraditional careers has significant economic and social implications. From an economic perspective, the traditional female careers into which significant numbers of girls are directed pay substantially lower wages than nontraditional fields. For example, in the field of cosmetology, in which girls represent 98% of the students, workers typically earn a median wage of $9.52 per hour, yet in the electricians' field, in which girls comprise only 6% of students, the median earnings are more than twice as much, at $20.33 per hour (National Women`s Law Center, 2005) According to studies conducted by the National Women's Law Center, these disparities exist throughout other traditionally female and male occupations and have led to the conclusion that the wage data clearly show that the fields that girls have traditionally been encouraged to enter and which they continue to prepare in large numbers today provide much lower wages than do the fields that boys enter**.**

In terms of social consequences of gender inequity, Daines, Hartenstein, and Birch (2000) state that the lack of access to work and education or training opportunities for women is a societal problem that results in underdeveloped human resources. It also limits a nation's development, for a nation's ability to have a healthy economy directly relates to developing its human resources. The disparity in gender equity affects not only girls and women, but men and boys as well. In addition, men who work in nontraditional occupations for their gender face institutionalized challenges, as well as intimidating behaviors, stereotypes that prevent full participation, and job-placement difficulties (Lufkin & Wiberg, 2007)

### 5.1.2 Subject treatment

The quantitative responses indicated that 72% of students disagreed that subjects in the institution were treated equally while only 28% agreed. From these figures it is evident to reveal that subjects in the curriculum were treated equally. Respondents were also interviewed to establish why they said that subjects in the curriculum were treated equally or not. Factors that emerged as

unequal subject treatment of Design and Technology included; poor infrastructure where facilities are not available such as workshops and equipment, limited time to do practical work which resulted in more theory work and low staffing for Design and Technology. Respondents revealed that Design and Technology had minimum periods as compared to other subjects like mathematics. Results further said that other subjects like science had enough rooms for their practical and that materials and equipment were readily available most of the times but that was not the case with Design and Technology. Findings also revealed that other Departments like Mathematics and English had enough teachers to handle all the classes. The case was different with Design and Technology. Results from the study suggest that student teachers' negative attitudes towards Design and Technology could be attributed to the factors highlighted which could hinder learning. Teo (2009) agrees that the presence of external variables such as lack of materials and equipment, lack of knowledge, limited time for practical, dangerous tools to handle, poor infrastructure had a significant influence on the students attitudes towards Design and Technology.

### 5.1.3 Easy Option

Respondents were asked if they found Design and Technology easy. Results revealed that 50% of respondents agreed that Design and Technology was easy. When respondents said that Design and Technology is easy, they must not consider themselves not to be talented or clever. This suggests that work is required to ensure tasks set are of sufficient complexity and challenge to ensure engagement of those undertaking them. This relates to curriculum planners who should review the curriculum so that it can have an impact on the student teachers. Engagement of students would play some role in their future plans and careers. On the other hand one respondent interviewed stated that when you are just learning without hands on, it is a very difficult and so complex.

## 5.2 Causes of Student Teachers' positive/negative attitudes on Design and Technology

The principle component analysis of students` responses to the causes of students` attitudes towards Design and Technology were identified as perceived importance of Design and Technology; perceived level of difficulty; lack of knowledge about the subject; career prospects; shortage of resources; limited time allocation and dangerous tools to handle.

### 5.2.1 Importance of Design and Technology

Design and Technology had been found useful by a broad range of student teachers who cited self-employment as a benefit of taking the subject. As Loudesamy (1972) pointed out that an important criterion which has a strong influence on the public attitude towards vocational education is the extent the graduates of the vocational schools are successful in getting jobs in their skilled areas. An overwhelmingly majority of respondents agreed that Design and Technology would create employment and further said that it was a life skill which would be continued even after retiring as a teacher. These findings are in line with Ministry of Education (1996) justifying the inclusion of practical subjects in the school curriculum claiming that they possess a potential relationship to the world of work and hence may help prepare pupils for post-employment or vocational training. The relevance of practical subjects to the job market is linked to one starting up their own business and consequently become self-employed. The research findings indicated that among the factors that caused student teachers' attitudes towards Design and Technology were the benefits students would get after taking the subject. Respondents interviewed discussed the benefits of Design and Technology: One of the respondent stated that they would work for themselves because they were able to fix pot handles, fix tables and chairs which would sustain them apart from being a teacher.

Others cited the benefits even when one dropped out of school, the skill acquired from Design and Technology would sustain their living with an income. As Lungwangwa (1980) agrees with the assertion when he acknowledged the inclusion of technical subjects in the school curriculum. He further on states the intention of the policy for inclusion of Design and Technology in learning institutions in Zambia which was intended to promote among other things self-reliance of education institutions, as well as, individuals. Others whose benefits focused on educating others could still point to gains in skills and knowledge which they would later transfer stated that the main benefit of taking Design and Technology was to impart knowledge to others so that they can also be self-reliant. Others again said the subjects simply created High Opportunities for them since Zambia, as a nation has had few Design and Technology teachers.

Furthermore one respondent revealed on the career prospects of Design and Technology and indicated that after completing her training, she would open an internet café and create employment for others. Similarly, another respondent said that he would open his own workshop in case he was not employed by the government and would sustain his family. Findings show that

respondents have a bright future in as far as their career is concerned. In another study Ardies, De Maeyer, Gijbels, and Van keulen (2015) have noted that the interest of children in technology increases every day and as they age and that the students that use technology effectively or that attend classes about technology tend to make their professional preferences also in the area of technology. This further explains that the more students are exposed to technology in form practical the more the interest will be enhanced.

The relevance of practical subjects to the job market is linked to one starting up their own business and consequently become self-employed. Self-employment can be referred to as a person who works for himself/herself instead of an employer but drawing income from a trade or business that they operate personally. Bynes (2010) adds that Design and Technology has a central role to play in education; it is well placed to develop a future-oriented curriculum with a designedly thinking at its core. The key factor revealed by the respondents` career was anchored on the availability of opportunities. It was evident that students consider the apparent usefulness of the subject to future careers and jobs. This factor determined student teachers' attitudes towards Design and Technology.

### 5.2.2 Lack of Resources

Shortage of materials and equipment emerged as a major drawback of Design and Technology. This result was confirmed in the self-administered questionnaires and the semi-structured interviews. Lack of equipment and other resources was found to be the leading factor to the decline in uptake of Design and Technology. Results also revealed that comments about the subject being difficult resulted from the shortage of resources such as books, tools, material and equipment which led to uncompleted work leading to poor performance of the subject. Lack of resources also impacted on one of the important dimension of classroom climate necessary for creativity in Design and Technology as was discussed by (McLellan & Nicholl, 2008). Similar results have also been found in Britain where lack of resources has been flagged-up as a major factor impacting student attitudes (Dakers, 2006)**.** Affording students the necessary freedom to generate and realise creative solutions to problems is a motivational attribute in Design and Technology and lack of resources would definitely work against the uptake of the subject. This is a critical aspect in the role of the teacher who needs resources to teach effectively and adopt

successful teaching methods in order to ensure that the student teacher is knowledgeable and capable.

### 5.2.3 Classroom Environment

Comments made by respondents indicated that there are few Industrial Arts Teachers in Zambia. The few teachers available for Design and Technology will see an obstacle to effective teaching due to large numbers of classes and students who may be over enrolled. Over enrolment also has an impact on the attitude of students and teachers. The implication here is that the classroom space available for practical lessons and examinations may not be sufficient to accommodate large numbers of pupils in classes therefore the quality of learning is compromised. This suggests that the limited number of teachers may be overwhelmed with work and would not have time to prepare for their lessons adequately. Consequently, this also means that teachers will not have sufficient time to attend to individual students especially those that may need remedial work outside learning hours. Findings also revealed that that Design and Technology had lack of qualified staff. This suggests that Professional Development should focus first on increasing teachers` knowledge and skills, which can then help increase their confidence. This also suggests the possibility for further improvement in this aspect, particularly the supply of materials and equipment needed in the Design and Technology workshop. Increasing the availability of materials and equipment would help boost students' attitudes towards Design and Technology.

The time allocated to teach practical lessons also is another factor that merit mention. Results revealed that Design and Technology was accorded limited time to do practical work which resulted in more theory work. This time allocation includes the time spent learning in the classroom and engaging in practical work in the workshops. Findings of the study indicated that students had to spend a substantial amount of time engaging in practical work which they said was not enough. Findings in a study in Finland found that the essence of human intelligence is not only to link theory and practice but also to learn from experience (Bynes, 2010). The author further indicated that gaining experience is crucially a matter of acting in and on the world and that human being have developed the art of advancing theory by means of practice and experiment.

The number of periods are far too less to ensure that practical lessons are taught successfully. This resulted in students completing their projects outside the scheduled timetable. Adequate

time can help develop positive attitudes towards Design and Technology. This curriculum related factor contributed to the student teachers' negative attitudes towards Design and Technology. Darlu (2004) revealed that the workshop is a place to do practical work to reinforce theory into practice. The author further states that the workshop is important to increase the driving force for students to acquire the skills they have learnt resulting in enhanced interests among students to pursue this study to greater depth. In another research Ronkko and Aerila (2015) adds that the hands-on activity is motivating for craft maker, and crafts should not be mere visualisations and modelling. Another author, Syrjalainen and Serlamaa-Hakkarainen (2014) also supports that craft making is a way to materialise design thinking. The author further states that the situation creates new knowledge and creates the potential for learning.

### 5.2.4 Perceived level of difficulty of Design and Technology

Lack of background knowledge was another factor contributing to students` attitudes towards Design and Technology. Results revealed that some students did not take Design and Technology at primary and secondary schools because it was not an optional subject which was only offered in a few technical schools around the country. As a result some respondents were taking Design and Technology for the first time. Consequently, this resulted in the perceived level of difficulty because of the new concepts contributing to attitudes towards Design and Technology. Some respondents perceived the practical part of Design and Technology difficult and that the problem-solving aspect was not considered. These results suggested that because the problem-solving aspect of Design and Technology was not sufficiently amplified, such students found Design and Technology difficult. McLellan and Nicholl (2008) found out that although overall students were positive about Design and Technology, a substantial number felt they were not being sufficiently challenged, and were being asked to do meaningless work.

### 5.2.5. Parental Influence

Another important aspect on the cause of student teacher attitudes was attributed to course advisors. According to the findings, 42% of the respondents were advised by their family, 28% were advised by teachers, 24% were advised by friends while 6% did not respond to the question. As indicated, the highest percentage of respondents was advised by their family due to parental influence. Payne (2003) notes that parents appear to set the boundaries within which choices are made, as a result young people do not even consider some options as possibilities. Payne further

states that parents are the most influential source of advice and help when decisions have to be taken, although advice from other family members, especially siblings is often valued. This supports and adds to the findings of McCrone et al. (2005) who showed similar results in their review of literature on pupil choice noted socioeconomic circumstances and parental advice had strong influence on pupils' choice of options. They also reported that young people's views varied widely on the degree of influence they attributed to their parents when they made their subject and career choices. This also indicates that not so much was done at University level to prepare students to take Design and Technology.

## 5.3.How do School Managers or Principals and Teachers influence Student Teachers' Attitudes towards Design and Technology?

### 5.3.1 Administrators and Teachers` roles

A role is essentially a set of expectations imposed on a person by others; in this case it could be parents, society, students or school curriculum. In other words, the role of a teacher is assumed to be the essential link in the relationship between the teacher's functions and student teacher behaviour and attitude. Results highlighted factors influencing students` attitudes towards Design and Technology it was relevant to seek views of the students about the factors to get further understanding into the matter. The views of Design and Technology students are important in influencing other students and society at large about the subject. If their views are negative, that is how they will influence other students, their siblings and parents towards the subject.

Most of the respondents talked to agreed they had interest in Design and Technology because of the benefits attached. On the contrary, one of the respondents expressed negative statements when asked if he was interested in taking Design and Technology. He clearly said that he didn't like some components which were integrated in Design and Technology that involved practical work in the workshop. Lack of interest was seen as a result of forcing student to take particular subjects at the allocation stage. Suitable methods of allocating students to these classes should be employed so that their interests are considered. The findings also presented the methods that were used by administration to allocate students into various classes. Various methods and processes were indicated by the respondents and most of them were similar. Nevertheless, the processes

used by management show the lack of appropriate procedure for determining the needs of all students. In some cases it was observed that the allocations were done at random and not necessarily considering the students' interests especially in such instances where students were forced to take up the subjects. This could be another dimension that attributes to student teachers' negative attitudes towards Design and Technology.

The study also revealed that the majority of the students did not take Design and Technology as a compulsory subject at junior and senior secondary school because Design and Technology was only offered in technical secondary schools. This implied that talented students in Design and Technology therefore missed an opportunity to discover their talents when they happened not to be admitted in technical schools that offered Design and Technology, a case which may result in a negative attitude towards the uptake of the subject. This further confirms that the changes in the Zambian curriculum by the Ministry of Education, One of the recommendations put forward by the Ministry of Education emphasized that students need to have not only knowledge but also the values, attitudes, skills and competences which will enable them to make the best use of their learning. The curriculum has since been implemented and resources are being distributed to various schools throughout the country. School administrators have further been advised on the choice of practical subjects which depends largely upon the environment, facilities and staff available in the schools including the individual student preference.

The teachers` role is to insure that students become knowledge and capable through the use of the guidance document which will help teachers use the revised curriculum document effectively and adopt successful teaching methods which has resulted in yet another challenge of unqualified teaching staff to teach Design and Technology. The lack of training on the part of the teacher due to the revised curriculum may result in the non-teaching of the subject due to lack of competence. In-service training of teachers in Design and Technology would enable the student to make the best use of their learning.

Respondents were asked on the course advisor and results revealed that 42% of the respondents were advised by their family, 28% were advised by teachers, and 24% were advised by friends while 6% did not respond to the question. A bigger percentage of 42% were advised by the family. It is clear that teachers did not play a major role in as far as interacting with learners on the value of Design and Technology. The interaction between teachers and students involves a

broad range of matters that deal with personalities and methods of interaction. Kalanda (2005) in the review indicated that personality and behaviour of the teacher is very important in the formation of student attitudes. Results have indicated that teachers play a major role in what happens in the classrooms. To implement the aims of the curriculum, the teacher must be able to direct the designing of the product to offer space for thinking creatively, analytically, practically and also give space to different creative solutions and options for technical realisations (Vanada, 2014). If students are encouraged to think critically, to ask questions and to look for answers independently, students` self-esteem will grow. At the same time the students role changes, students commit to studying instead of expecting ready-made answers from the teacher and are courageous enough to question, pay attention and be willing to experiment (Starko, 2010).

As a Facilitator, the teacher has to structure learning in such a way that good learning experiences are brought to the fore. Jackson (2013) argued that the teacher is required to establish a balance between methods that effectively deliver content and develop skills. This is done by organizing activities that help students to actively participate in their own learning.

Mohammad (2009) adds that to produce quality education, teachers need to make a paradigm shift in approach and learning methods in order to encourage students to think in creative and innovative ways. The recent changes in education seem to point towards child-centred learning. To produce quality education, teachers need to make a paradigm shift in approach and learning methods in the classroom in order to encourage students to think in creative and innovative ways. The creative teacher often provides challenging new situations to be explored by the students and encourage them to think about all the possibilities that can be produced from the situation. Essel (2001) observes that teachers should improve their competencies in handling practical lessons so as to develop confidence in the students. This may imply that besides teaching skills, vocational teachers should also attempt to describe work situations or job prospects in which these skills can be put to use. Consequently, as Nkonde (1989) admits that factors like administrators, immediate supervisors, parents and teachers are contributing factors to attitudes towards Design and Technology. He revealed that administrators have an important role to play in the improvement of Design and Technology. Nkonde further states that the problem may not be with the students but the supervisors who have ignored the importance of practical subjects and consider subjects like Mathematics, English and Science more than Design and Technology.

Results indicated that most of the respondents indicated that subjects in the curriculum are not treated equally. This may change the thinking of the students taking practical subjects. This may result in a negative attitude towards the uptake of the subject. The negative attitude prevailing will call for a lot of sensitization for the students and teachers on the relevance of education and Design and Technology in particular. The implication could be a feeling of discouragement in the face of academic failure, the value students place on education and practical subjects in particular and the way they see themselves. According to Atkinson (2013) Design & Technology teachers need to be more than just enthusiastic about the process if they are to develop enthusiasm in their pupils that will sustain them through the exciting but sometimes arduous and difficult process required to achieve outcomes of which they and their teachers can be proud. This agrees with the findings of Essel (2001) who identified and summarized the role of high school administrators and teachers that they have a major role to play in as far as practical subjects are concerned. She further states that Administrators are encouraged to emphasize the importance of these practical and technical subjects in the curriculum and their benefits for self-employment.

Overall, these findings provide empirical support cited in literature that adequate facilities and equipment has positive impact on attitude formation towards Design and Technology. Findings further extend validation of the theoretical framework adapted from Ajzens` Theory of Planned Behaviour to be useful model to explain student teachers' attitudes towards Design and Technology. The theory accounts for Perceived Behavioural Control, or one's perceptions of internal or external constraints on performing behaviour. This is demonstrated in the linear process of the model, in which one key construct clearly leads to another in the theory's explanation of behavioural intent. When envisioned as Ajzen first proposed, the Theory of Planned Behaviour provides a clear explanation how behavioural and normative beliefs affect an individual's behavioural intention, which leads to the prediction of actual behaviour.

On the other hand, results from the study suggest that student teachers' negative attitudes towards Design and Technology could be attributed to other external factors that can hinder learning. Teo (2009) suggests that the presence of external variables such as lack of materials and equipment, lack of knowledge, limited time for practical, dangerous tools to handle, poor infrastructure had a significant influence on the students attitudes towards Design and Technology. This is also in line with Ingram and Collerette (2003) who argues that external variables can enhance understanding of what influences attitudes and their presence can contribute to effective learning. A similar

study was conducted on the Factors affecting the Utilisation of Industrial Arts Departments in Secondary Schools by Mulenga (2001). Factors that emerged in this study were: lack of support by school administration, non-operational workshop rooms, insufficient equipment, and inadequate provision of materials, poor teachers' motivation and attitudes towards work.

Another study by Nakawa (2012) on an Investigation on the nature of factors affecting pupils' interest and attitudes toward learning Mathematics in selected Secondary Schools in Eastern Province. The results from the study showed that pupils in secondary schools of Eastern Province had interest though weak, looking at the scores, they obtained and had negative attitude towards learning mathematics. The pupils from rural secondary schools were less interested in learning mathematics that is, compared to the urban pupils. The study identified five factors affecting secondary school pupils learning Mathematics in Eastern Province. The following were identified namely: the Mathematics Teachers, the parents, lack of text books, poor background from primary school and the environment where a pupil resides. The study also established that the Mathematics teachers were contributing to pupils' loss of interest and development of negative attitudes. The studies highlighted which were conducted in Zambia have a connection to this study conducted to examine Student Teachers' Attitudes towards Design and Technology at Chalimbana University. The factors that imaged influential in the two studies have a link in terms of element of this study. For instance, teachers' motivation as a factor could be used by Lectures at Chalimbana University in the teaching and learning strategies employed by lecturers to student teachers` in Design and Technology.

## 5.4 Chapter Summary

The findings of the study revealed that factors of the items presented for analysis where proved to be factors that could influence the attitude of student teachers' attitudes towards Design and Technology. This study has shown that resource availability in design and technology is an important determinant that impacts upon disposition of student teachers' attitudes towards Design and Technology. Resource constraints appear to have had a negative impact on students. Consistent with findings reported in literature, study also established positive relationships. The level of the interest of the students in the study of Design and Technology subjects is high because students find the subjects easy and that they like the subjects. Interest was aroused through the practical skills they would acquire in the workshop. The study highlighted the benefits of taking Design and Technology which included; self-employment, imparting knowledge on others and high opportunities. With respect to gender differences, the study's findings were consistent with those reported elsewhere. Such studies have also recommended the need for female role models to help remove gender stereotyping of girls, which may negatively influence their attitudes toward Design and Technology.

# CHAPTER SIX

# CONCLUSION, RECOMMENDATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

## 6.1 Introduction

This chapter provides conclusions of the study with respect to the findings and lists some recommendations based on the findings reported. The conclusions are about the connection between the findings of the present study and published literature. In the recommendations, an overview of ideas and suggestions for further research is provided. Also, included in this chapter are suggestions that could be used to build on the present study.

## 6.2 Conclusion

In conclusion, findings from the study suggest that Design and technology remains one of the most exciting areas of study that is in touch with every aspect of human nature. It is this responsibility that Design and Technology carries that makes it a priority area of study. However, the lack of material and equipment appears to be a major obstacle to the development of this important area of study. Despite the governments current policy on education in Zambia; Educating our Future, Ministry of Education (1996) which emphasises on practical skills as a means of preparing youths to become useful to themselves and the society after school. This study has shown that resource availability in design and technology is an important determinant that impacts upon disposition of students towards Design and Technology. This is an important finding because it suggests that teachers need to help students learn in a manner that would enhance their life-long learning skills. Students are not all alike because each one sees the world in a way that makes the most sense to them. Such individualized perceptions shape what students think, how they make decisions, and how they define what is important. Affording students the necessary freedom to generate and realize creative solutions to problems is a motivational attribute in Design and Technology and lack of resources undermines this dimension. Findings also noted the comprehensiveness of the subject content and the lack of time to complete the syllabus within the given time. Results also revealed that 8% of the respondents disagreed that they have seen any advertisement on the media for Design and Technology. This suggests

opportunities for further sensitization of Design and Technology to the public for people to realize the benefits attached to Design and Technology.

The present study has added to a body of literature pertaining to student teachers' attitudes towards Design and Technology. Even though the study was not aiming to explore teachers` attitudes towards Design and Technology it does offer some useful insights on student teachers' attitudes towards Design and Technology. A significant finding of the study is that resource availability in design and technology is an important determinant that impacts upon disposition of students towards Design and Technology. This assertion concurs with Ajzen and Fishbein (2005) that familiarity can lead to positive feelings and when such positive feelings are activated; their effect would be expected to influence an attitude, which, in turn, has an impact on actions.

Consistent with findings reported in literature, study also established positive relationships. The level of the interest of the student teachers' in the study of Design and Technology subjects is high because the students find the subjects easy and that they like the subjects. Findings further extend validation of the theoretical framework adapted from the TPB theory to be a useful model to explain student teachers' attitudes towards Design and Technology at Chalimbana University. The study suggests that providing students with the needed resources would further enhance awareness on benefits from Design and Technology and their attitudes towards taking the subject could improve significantly. On the other hand, resource constraints appear to have had a negative impact on students. Results from the study suggest that student teacher negative attitudes toward Design and Technology could be attributed to other external factors. Identification of attitudes and their factors would provide useful knowledge for education stakeholders, which can help in planning and increasing effectiveness of Design and Technology by working out factors, which lead to negative attitudes and strengthening those leading to positive attitudes. The key positive outcome of this study is that sufficiently providing students with the necessary resources for all aspects of the subject would be a step in the right direction.

## 6.3 Recommendations

- Key findings state that there is lack of materials in the teaching of Design and Technology. The finding had a direct impact upon student teachers and contributed to the negative attitude towards Design and Technology. The Ministry of Education should therefore support the curriculum through provision of facilities, equipment and recruit teachers to teach the subject in schools.

- The Ministry of Education should come up with a deliberate policy to sensitize students and parents on the importance of Design and Technology to enhance students' attitudes.

- Teachers in Zambia should be encouraged and motivated to further their studies in subjects that they are qualified to teach, particularly in Design and Technology. Furthermore, the Ministry of Education should also organize workshops, in-service training and seminars to update teachers on new developments in Design and Technology curriculum and to increase capacity for effective teaching.

## 6.4 Suggestions for Future Research

- Since the current study focused on only student teachers' attitudes towards Design and Technology, the future research may consider studying administrators and teachers` attitudes towards Design and technology.
- There is need to extend the study to other provinces in order to find out whether the results obtained in this study could be generalized.
- Through monitoring, Government should ensure that TVET Policy objectives that have been formulated are addressing the socioeconomic challenges faced by the nation.
- Future investigations should explore how socio-economic and cultural background influences attitudes on Design and Technology.

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**APPENDICES**

APPENDIX 1

| Control Number | |
|---|---|

**SELF ADMINISTERED QUESTIONNAIRE FOR DESIGN AND TECHNOLOGY LEARNERS.**

**UNIVERSITY OF MALAWI**

**THE MALAWI POLYTECHNIC**

**FACULTY OF EDUCATION AND MEDIA STUDIES**

**DEPARTMENT OF TECHNICAL EDUCATION**

Dear Respondent

My name is Mbevya Mbao an MTVE student at University of Malawi-The Polytechnic. I will be very grateful if you could spare some time to complete this questionnaire for my dissertation. You are therefore requested to be as objective as you possibly can be in completing this questionnaire. You are advised not to write your name for purposes of confidentiality. The obtained information shall therefore be strictly used for academic purposes only.

## I. DEMOGRAPHIC QUESTIONS

1. Indicate your gender by ticking (√) in the appropriate box.

   Male 〔 〕 Female 〔 〕

2. Name of Institution

   ……

3. State the number of students in your class? …….

4. When you chose your course who gave you advice? e g teachers, family

   Teachers [ ] Family [ ] Friends [ ] Others [ ]

5. What criteria did the institution use to allocate students in the Design and Technology classes?

   By choice [ ] Forced [ ] Picked at random [ ] other specify……..

## II. ATTITUDINAL QUESTIONS

6. Please tick (√) in the box with your most appropriate response.

| Item | As a Student | Agree | Partially Agree | Disagree |
|---|---|---|---|---|
| i. | I like my Design and Technology subjects. | | | |
| ii. | Design and Technology subjects are interesting. | | | |
| iii. | I think Design and Technology subjects are easy. | | | |

| | | | | |
|---|---|---|---|---|
| iv. | After Graduating I will get work easily. | | | |
| v. | I would consider my future career in Design and Technology to be good. | | | |

7. Are all the subjects in the curriculum at your school treated equally?

   a. Yes [ ] No [ ]

   b. Explain your response in (a)

8. How has Design and Technology met your expectations?
   ……
   ……
   ……

9. What do you think are the benefits of taking Design and Technology course?
   ……
   ……
   ……

10. What challenges do you face in the learning of Design and Technology?
    ……
    ……
    ……

11. Recommend measures that can be put in place to improve Design and Technology at your institution.

    ……

    ……

    ……

    ……

Thank you for your time

## APPENDIX 2

## GUIDE FOR SEMI- STRUCTURED INTERVIEWS FOR DESIGN AND TECHNOLOGY LEARNERS

**UNIVERSITY OF MALAWI**

**THE MALAWI POLYTECHNIC**

**FACULTY OF EDUCATION AND MEDIA STUDIES**

**DEPARTMENT OF TECHNICAL EDUCATION**

I am a student at the Polytechnic pursuing a Masters of Vocational and Technical Education. I am a second year student doing a research. I therefore request you to help me gather information for my study. The obtained information shall therefore be strictly used for academic purposes only.

1. What do you understand by Design and Technology?

2. What is your opinion on Design and Technology?

3. Are you generally satisfied with the work and assignments you have to do?

4. Some people think men have an easier time learning Design and Technology as compared to women. What do you think?

5. Some people think you have to be good at Mathematics to do Design and Technology, how do you feel about this?
6. Who did you talk to before deciding to do your Design and Technology course? What were the most important factors that helped you to decide?
7. What do you think are the benefits of taking a Design and Technology course?
8. What do you think are the disadvantages?
9. Do you believe that Design and Technology knowledge and understanding will help you to get a job?
10. Have you seen any advertising for Design and Technology learning?

11. Is there anything else?

Thank you for your time.

## APPENDIX 3

## INFORMED CONSENT FORM

My name is Mbevya Mbao. I am a student at the University of Malawi-The Polytechnic. I am conducting an academic research towards my award of Masters in Technical and Vocational Education. The proposed title is: "Student Teachers' attitudes towards Design and Technology: The case of Chalimbana University"

Before agreeing to participate in this research, I strongly encourage you to read the following explanation of this study. This statement describes the purpose and procedures of the study. Also described is your right to withdraw from the study at any time. This study has been approved by the Supervisors at the University of Malawi-Polytechnic.

This study is designed to examine Student teachers' attitudes towards Design and Technology at Chalimbana University. I am conducting this study to learn more about attitudes of student teachers towards Design and Technology since it has not been studied much in the past. Participation in the study involves completion of questionnaires that asks you basic about yourselves and a face-to-face interview, which will last for approximately 20 to 30 minutes. I will conduct the interviews, audio-tape and later transcribe for the purpose of data analysis. I will interview you separately from the other students in the classroom on the campus at Chalimbana University.

There are no risks or discomforts that are anticipated from your participation in the study. Potential risks or discomforts include possible emotional feelings of sadness when asked questions during the interview. The anticipated benefit of participation is the opportunity to discuss feelings, perceptions, and concerns related to Design and Technology. This may have implications for curriculum design and teaching and learning strategies employed by Lecturers to students in Design and Technology classes at Chalimbana University.

The information gathered during this study will remain confidential. Only the researchers will have access to the study data and information. There will not be any identifying of names on the questionnaires or interview transcripts. Your names and any other identifying details will never

be revealed in any publication of the results of this study. The tapes will be destroyed at the completion of the study. The results of the research will be published in the form of a research paper and may be published in a professional journal or presented at professional meetings. It may also be published in book form. The knowledge obtained from this study will be of great value in guiding professionals to be more effective in the teaching and learning of Design and Technology. Participation in this study is voluntary; refusal to participate will involve no penalty. You are free to withdraw consent and discontinue participation in this project at any time without prejudice or penalty. You are welcome to ask the researcher any questions that occur during interview. If you have further questions once the interview is completed, you are encouraged to contact the researcher using the contact information given below. +260977877735 or via email at mbevyambao@gmail.com

I, _____ (name; please print clearly), have read the above information. I freely agree to participate in this study. I understand that I am free to refuse to answer any question and to withdraw from the study at any time. I understand that my responses will be kept anonymous.

_____ _____

## APPENDIX 4

### Permission letter to the Provincial Education Officer

The District Education Board Secretary,

P.O. Box 33,

Chongwe.

Dear Sir/Madam,

**Re: Permission to conduct research in Chongwe District**

With reference to the above, I am seeking your permission to allow me to conduct a research in the district.

I am a student from University of Malawi-The Polytechnic pursuing Master of Technical and Vocational Education and wish to collect information from Chalimbana University which is within your district.

Thank you in advance.

Yours faithfully,

Mbevya Mbao

## APPENDIX 5

## BUDGET FOR FINAL RESESEARCH

| S/N | Activity | Unit Cost | Units | Days | Amount |
|---|---|---|---|---|---|
| | **Fieldwork** | | | | |
| 1. | Researcher | 300.00 | 1 | 20 | 6,000.00 |
| | Research Assistants | 150.00 | 1 | 10 | 1,500.00 |
| | | | | | |
| 2. | **Stationary** | | | | |
| | Reams of paper | 40.00 | 10 | - | 400.00 |
| | Pens | 50.00 | 1 | - | 50.00 |
| | Pencils | 10.00 | 1 | - | 10.00 |
| | Photocopying | 600.00 | | | 600.00 |
| | 10% contingency | | | | 1 600.00 |
| | **Total** | | | | **10,160.00** |