

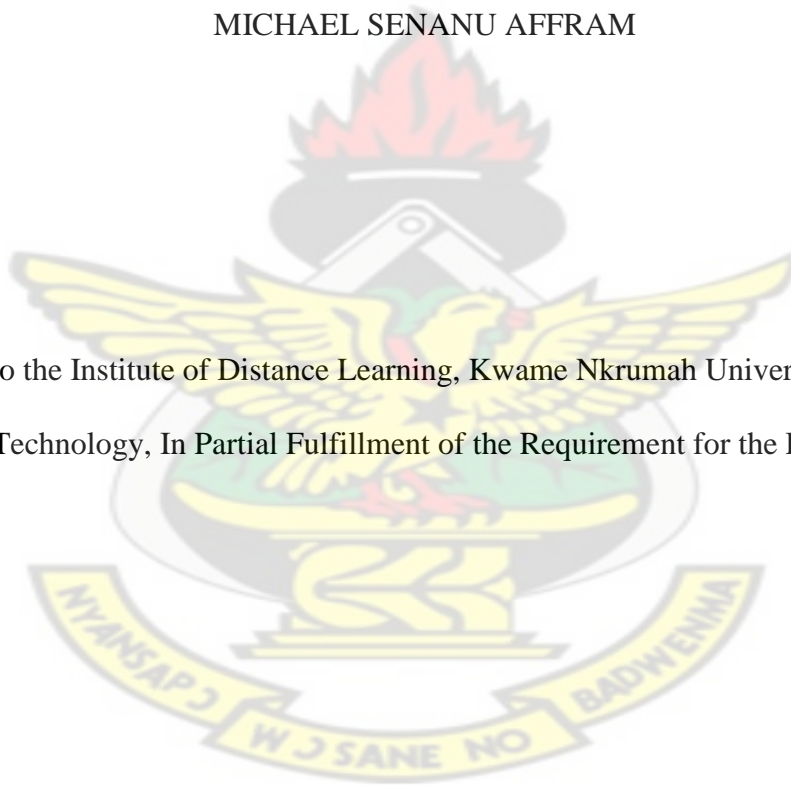
INNOVATION AMONG SMALL AND MEDIUM ENTERPRISES (SMEs)

IN THE VOLTA REGION. THE ROLE OF TACIT KNOWLEDGE

BY  
KNUST

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A Thesis to the Institute of Distance Learning, Kwame Nkrumah University of Science  
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INNOVATION AMONG SMALL AND MEDIUM ENTERPRISES (SMEs) IN THE  
VOLTA REGION: THE ROLE OF TACIT KNOWLEDGE

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BY

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MAY 2011

## CERTIFICATION

I hereby declare that this submission is my own work towards the CEMBA and that, to the best of my knowledge, it contains no materials which is previously publish by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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## **DEDICATION**

I dedicate this work to my Wife, Ivy Adzo Letsah and also to my son, Esmond Sena

Affram

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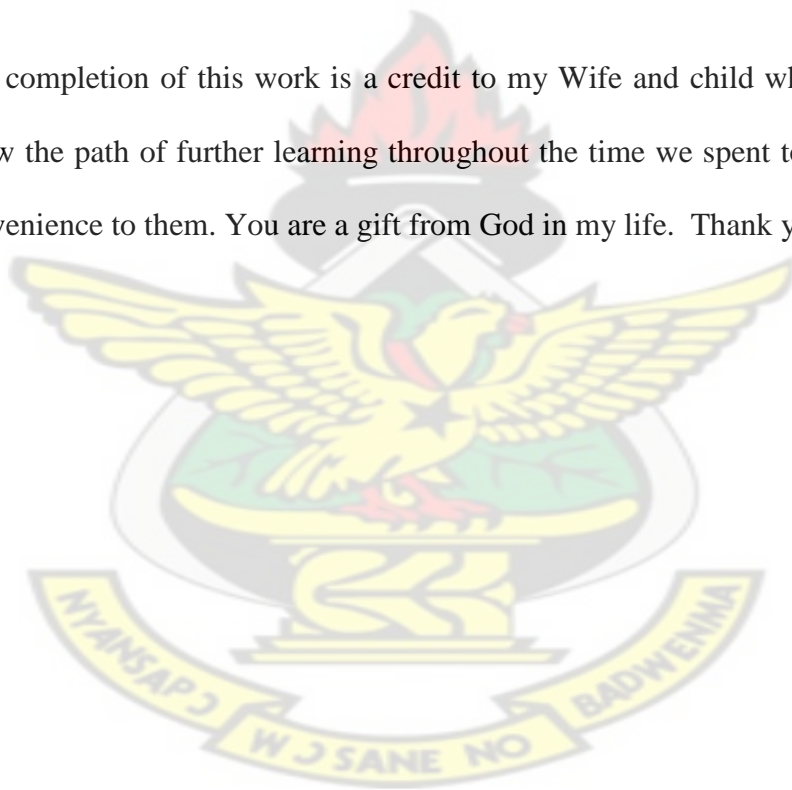


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May the name of the Almighty be praised now and forever more, for how far he has brought me, Amen.

It will be very ungrateful of me to frown upon the indisputable intelligence and academic experience of my supervisor Mr. Ben Honyenuga who made all effort to bring the best out of me through her unquenching support, guidance and assistance. I cannot forget to thank Mr. Ayimah for his statistical assistance. Not forgetting my Typist Miss. Grace Nwannah.

Finally, the completion of this work is a credit to my Wife and child who have allowed me to follow the path of further learning throughout the time we spent together, often at great inconvenience to them. You are a gift from God in my life. Thank you.



## LIST OF ABBREVIATIONS

EU	European Union
NBSSI	National Board for Small Scale Industry
SMEs	Small and Medium Enterprises
TQM	Total Quality Management



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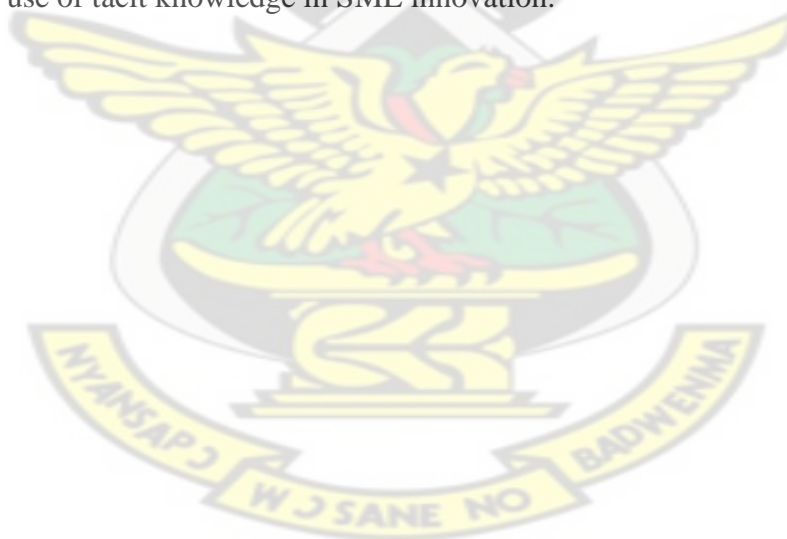
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## ABSTRACT

The purpose of this research is to examine the role of tacit knowledge in innovation among SMEs. Compared to available research material on explicit knowledge, the role of tacit knowledge in innovation within SMEs is relatively unexplored. Through literature review and the use of interviews, the role of tacit knowledge in innovation of SMEs is analyzed. The findings reveal that tacit knowledge use in the SME innovation begins with the discussion to embark on the product, knowledge acquisition, training processes, how new products are introduced, documentation of innovative processes and protection of new ideas. The study discovered that tacit knowledge has a crucial influence on innovation among SMEs and plays a vital role as a company resource and success factor. Based on the findings, recommendations have been made which when implemented will enhance the use of tacit knowledge in SME innovation.



## CHAPTER ONE

### INTRODUCTION

#### 1.0 Background of the Study

This chapter discusses the overview of the study. It includes background to the study, problem statement, objectives, and research questions of the study, methodology, significance and organization of the study

The concept of tacit knowledge and innovation are of contemporary interest. In some ways they are indicators of the health of a firm. In fact, a lot of interest is being shown by enterprises to understand these issues and their implication for the firm. Small and Medium-sized enterprises (SME's) competitiveness and its business strategy are closely linked to the above (Nirmalya, 2010). Also, the interplay between tacit knowledge and innovation is not yet fully understood. SMEs are particularly vulnerable as they are entrepreneur driven. Being smaller organizations, most have very weak knowledge management practices. However, some have developed unique cultures and practices that help them benefit from the interplay between innovation and tacit knowledge. These SMEs have become more competitive in the market, while others, who have failed to realize the importance of these factors, are caught in the competition puzzle.

Small and Medium-sized enterprises (SMEs) are important feature of the global economy. Research shows that more than 99% of all enterprises in both developed and developing countries are made of SMEs (Van der Heijeen, 2002). Data collected from Register General's Department indicates that 90% of all companies registered are micro, small and mediums enterprises. They therefore stimulate economic growth and a major source of employment and income (Sam 2004). This presupposes that Ghana's economy is driven

by these SMEs. The SMEs however, depend heavily on innovation as the only source of competitive advantage. .

Innovation can be better understood as a process in which the organization creates and defines problems and then actively develops new knowledge to solve them (Nonaka 1994). Tacit knowledge is made visible through its application and can then be utilized in the innovation process (Leonhard and Sensiper 1998). The ability to innovate is increasingly viewed as the most important in developing and sustaining competitive advantage (Tiddet.la 2001). This depends upon the individual and collective expertise of employees. Some of this expertise is captured and codified in software, and processes. However, tacit knowledge also underlies many competitive capabilities (Dorothy and Sylvia 1998). Conversely, the management of tacit knowledge is relatively unexplored particularly when compared to the work on explicit knowledge (Dorothy and Sylvia 1998). In a developing country like Ghana which has a high illiteracy rate, knowledge appeared to be handed down from generation to generation. Thus the study sets itself to understand the role tacit knowledge plays in SME innovation in Ghana.

Knowledge is classified into two types as tacit and explicit by Polanyi (1966). Explicit knowledge is the type of knowledge that can be easily documented and shaped (Choi and Lee, 2003). Polanyi (1967) defined tacit knowledge as the knowledge that cannot be verbalized, is intuitive and unarticulated. It is knowledge that resides in intuitive realm. Polanyi (1967:4) captures this notion with the phrase “we know more than we can tell”. The distinction between tacit and explicit knowledge is the key to understanding organizational knowledge (Nonaka and Takeuchi, 1995). Tacit knowledge is embedded in the mind (Choi and Lee, 2003), can be expressed through ability applications; is

transferred in form of learning by doing and learning by watching. Based on Polanyi (1996), all knowledge has tacit dimensions. It can be completely tacit, semiconscious or unconscious knowledge held in peoples head and bodies (Leonard & Senisper 1998).

Tacit knowledge can be classified into two dimensions: technical and cognitive (Pathirage et al, 2007). Technical encompasses information and expertise in relation to 'know-how' while cognitive consists of mental models, beliefs and values. While explicit is ready to be explored, tacit knowledge is difficult to be extracted without the consent of the knowledge owner. Tacit knowledge and explicit knowledge complement each other and they are important components of knowledge management approaches in organizations (Beijerse, 1999). Cavusgil, Tamer, Calatone and Zhao (2003) note, that it is impossible to find absolute tacit or absolute explicit knowledge. The distinction between explicit and tacit knowledge should not be viewed as a dichotomy but as a spectrum with two knowledge types as the poles at either end. Thus knowledge types can be viewed as a continuum that ranges from explicit to tacit the higher the degree of tacitness, the harder it is to be transferred. In much of the literature and industry, tacit knowledge has been emphasized and recognized as an important strategic resource in the development of sustainable competitive advantage to firm grow (Baumerd 1999; Nonaka and Takeuchi 1995, Porter 1985 Sternberg et al (2000). The research done by Sternberg et al (2000) shows that much of the knowledge needed to succeed in real world tasks is tacit.

Bird (1994) is of the view that, if tacit knowledge is understood and transmitted at an individual or small working group level, it can then function as a catalyst for knowledge creation within an entire organization. For that matter this work seeks to address the role tacit knowledge can play in bringing about innovation in SMEs in Ghana.



## 1.1 Statement of the Problem

With limited resources for adopting new ways of working and increasing market shares small and medium-sized enterprises must seek out ways of increasing their competitiveness. Innovation is one of the key philosophies adopted to face these competitive conditions. For this to happen it is necessary for people to change the way they decide, they must choose to do things differently, make other choices than they used to do. Knowledge is a resource or stock in the organization (Coulson-Thomas, 2003) that exist along the organization. A firm cannot have the same knowledge as the others' because different firms have different human and knowledge resources (Kim, 2002).

Tacit knowledge is one of the strengths of an organization which is more difficult to transfer or copy (Nooteboom, 1993). In the resource-based theory, Hisrich et al (2008) further highlight that in order for firms to create its unique resources which are rare, valuable and non-immitigable; it has to exploit its internal knowledge.

Generally in Ghana knowledge is handed down from generation to generation through interaction, observation and imitation. SMEs in Ghana adopt various innovative measures using this mode of knowledge transfer. Tacit knowledge as it is known is an important component of innovation. Compared to the work on explicit knowledge, the management of tacit knowledge is relatively unexplored. The purpose of this study is therefore to bring to light the role of tacitknowledge in innovation among SMEs in the Volta region. The study hints that tacit knowledge can play an important role in innovation among SMEs.



### **1.2.1 Research Objectives**

The General Objective of the study is to explore the role of tacit knowledge in innovation among SMEs in the Volta region.

Specifically the study will attempt to:

1. Identify the type of knowledge used in SME innovations.
2. Identify the type of innovation among SMEs in the Volta Region
3. Identify the role of tacit knowledge in innovation among SMEs in the Volta Region

### **1.3 Research Questions**

1. What type of knowledge is used among SMEs?
2. What type of innovation is predominant among SMEs in the Volta Region?
4. What is the role of tacit knowledge in innovation among SMEs in the Volta Region.

### **1.4 Methodology**

#### **1.4.1 Research design**

The research design was exploratory as it met the criteria described by Polit and Hungler (1991) because it was designed to gain insight into the situation.

Qualitative approach was adopted to gain insight into people's attitudes, behaviours, value systems, concerns, aspirations, culture. The study was based on survey research in which data was collected once across the population through interview. Respondents constituted SMEs in the dressmaking industry in the Ho Municipality and weaving industry in the

AdakluAnyigbe District. Cross sectional studies often employ survey strategy (Rooson, 1991). Structured interview was used.

#### **1.4.2 Population and sampling Size**

Population might be defined as the totality of all subjects that conform to a set of specifications (Polit&Hungler 1995:43). The population in this study comprised all registered SMEs in the dressmaking industry in Ho Municipality and all registered SMEs in the weaving industry in AdakluAnyigbe district. This was so because weavers are more concentrated in the AdakluAnyigbe district.

The sampling approach is a process of selecting a portion of the population to represent the entire population(Polit&Hungler 1991:654).

The sampling approach used in this study was purposive because only the registered SMEs in the dressmaking and weaving industry were considered. There are 80 respondents. These comprises of 50 respondents from the dressmaking industry and 30 from the weaving industry.I have chosen 50 respondents from the dressmaking industry because of the higher number of registered firms i.e. 250 in that industry and 30 from the weaving industry because the registered firms are only 80 in this industry.

#### **1.4.3 Method of Data Collection**

Data for the study was obtained from both primary and secondary sources. The primary data was extracted from responses from the population using structured interview. This constituted the major source of data for the study. Secondary source was obtained from publication of Registrar General's Department, National Board for Small Scale Industries (NBSSI), and annual reports on business units.

#### **1.4.4 Data analysis and Presentation**

A descriptive and inferential method was employed in the data analysis. Frequency distribution, percentage and descriptive analysis evaluating the role of tacit knowledge among SMEs in the Volta Region were employed. The survey data was analyzed by using statistical methods. Statistical methods are a set of Mathematical techniques that allow the researches to make claims about the nature of world using forms of principles statistical argument (Terre Blanche and Durrheim, 1999). A descriptive analysis was also done using data collected from respondents.

#### **1.5 Significance of the Study**

The study will bring out the role of tacit knowledge in innovation among SMEs in the Volta Region and how SMEs must seek out ways of increasing their competitiveness.

Specifically the study will:

- Contribute to existing literature on SMEs in Volta Region.
- Bring out the role of tacit knowledge in innovation of SMEs in Volta Region.
- It will provide the basis for further research on SMEs in the Volta Region

#### **1.6 Scope of the Study**

The research work is limited to the garment sector in the Volta Region. Two districts in the region will be selected and 80 respondents will be selected.

#### **1.7 Organization of the Study**

The study is organized into five chapters. Chapter one introduces the study. Chapter two present a review of relevant literature. Chapter three highlights the methodology for the

study. Chapter four present analysis of data for the study. Chapter five gives summary observation, implications and recommendation that follow from the present study.

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## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.0 Introduction**

This chapter reveals the relevant literature to the study. Among other things, it discusses what small and medium size enterprises are, the concept of innovation and performance, types of innovation, the process of innovation, phases of innovation process, concept of knowledge, types of knowledge, theories of tacit knowledge, evolution of tacit knowledge, validation of tacit knowledge, transfer of tacit knowledge, the role of tacit knowledge in innovation, and conceptual framework.

#### **2.1 Small and Medium Size Enterprises,(SMEs)**

There is growing recognition of the important role small and medium enterprises (SMEs) play in economic development. They are often described as efficient and prolific job creators, the seeds of big businesses and the fuel of national economic engines. Even in the developed industrial economies, it is the SME sector rather than the multinationals that is the largest employer of workers (Mullineux, 1997). Governments at all levels have undertaken initiatives to promote the growth of SMEs (Feeney and Riding, 1997). Interest in the role of SMEs in the development process continues to be in the forefront of policy debates in Ghana (Ghana business news 2009). Hence the establishment of National Board for Small Scale Industries (NBSSI) in 1981 by Act 434 during Liman era to ensure the promotion and development of SMEs in Ghana. From the above it is clear that SME development can encourage the processes of both inter and intra-regional decentralization; and, they may well become a countervailing force against the economic power of larger enterprises.

More generally, the development of SMEs is seen as accelerating the achievement of wider economic and socio-economic objectives, including poverty alleviation (Cook and Nixon, 2000). Small enterprises in Ghana are said to be a characteristic feature of the production landscape and have been noted to provide about 85% of manufacturing employment of Ghana (Steel and Webster, 1991; Aryeetey, 2001).

The issue of what constitutes a small or medium enterprise is a major concern. Different authors have usually given different definitions to this category of business. EU Member States traditionally have their own definition of what constitutes an SME. But now the EU has started to standardize the concept. Its current definition categorizes companies with fewer than 10 employees as "micro", those with fewer than 50 employees as "small", and those with fewer than 250 as "medium" ([ec.europa.eu/enterprise](http://ec.europa.eu/enterprise))

There have been various definitions given for small-scale enterprises in Ghana but the most commonly used criterion is the number of employees of the enterprise (Kayanula and Quartey, 2000). Generally, in Ghana those employing up to 5 employees with fixed assets (excluding realty) not exceeding the value of \$10,000 are micro enterprises, those employed between 6 and 29 employees with fixed assets of \$100,000 are small enterprises and those that employ between 30 and 99 employees with fixed assets of up to \$1 million are medium enterprises (Dalitso & Quatey, 2000).

The competitiveness and even survival of an SME depends on the interplay between innovation and knowledge in the firm. It is often argued that SMEs are more innovative than larger firms. Many small firms bring innovations to the market place, but the contribution of innovations to productivity often takes time, and larger firms may have more resources to adopt and implement them (Acset *al.*, 1999). Transactions of SMEs and



processes involved in their products in Ghana are mostly not documented and are mainly passed on from generation to generation orally. Innovations and creative ideas of these businesses are also not protected due to their inability to document ideas. The researcher therefore seeks to investigate the role of tacit knowledge among SMEs in the Volta Region.

## **2.2 The concept of Innovation and Performance**

Currently innovation success has become very important issue. After many years, firms are forced to renew their product portfolio. Only with new products can they sustain their competitive positions by increasing revenues and profit, leading to an improved company value.

Schumpeter (1942) was the first person to identify the importance of innovation and entrepreneurship for development and growth. Thereafter scholars have developed different models of fostering innovation (Rothwell 1974, Abernathy 1985, Rothwell 1992, Barnett 1953, Becker 1967, Baumol 2002, Freeman 1982, Morgan 2005). Scholars have commented on the clear evidence of the positive and critical role played by innovation in the long-term profitability and growth of firms (Geroski 1992, Cosh 1996). Models of diffusion of innovation have also been developed (Rogers, 1962, Dosi 1992). The role of innovation in the garment industry among SMEs is perhaps more important than in any other industry. However, not sufficient work has been carried out on the role of tacit knowledge in innovation among SMEs, and its role in competitiveness.

Different methods exist to define innovation. One research direction underlines the novelty of an idea (e.g. Barnett 1953, Becker & Whisler 1967, Aregger 1976). “An innovation is any thought, behaviour or thing that is new because it is qualitatively different from existing forms” (Barnett 1953:7). Previous research has investigated the

characteristics and entrepreneurial behaviour of owner-managers and how these relate to decisions concerning innovative activities in their organizations (Bird, 1988; Lipparini and Sobrebo, 1994; Caird, 1994; Cosh and Hughes, 2000; Kickul and Gundry, 2002). For example, Caird (1994) found that the innovator is highly important in the commercial success of innovative products in SMEs.

Lipparini and Sobrebo (1994) argue that the entrepreneur's ability to "glue" external expertise and capabilities in an original and unique way is considered the key factor in pursuing innovative performance. Simon *et al* (2002) found that entrepreneurial confidence, adaptability, product championing, market emphasis and technological newness contributed to performance across all new product introductions in small computer firms. Wolf and Pett (2006) suggest that internalization and innovator position have a positive impact on new product improvement in SMEs. Kickul and Gundry (2002) found that the prospector strategy orientation mediated the relationship between proactive personality and three types of innovation: innovative targeting processes, innovative organizational systems, and innovative boundary supports.

Previous works have also investigated the importance of SMEs as drivers of economic growth and policy issues in national economies (Birch, 1989; Radosevic, 1990; Bowen and Ricketts, 1992; Sullivan and Kang, 1999; Henderson, 2002; Fisher and Reuber, 2003). Henderson (2002) contends that entrepreneurs create new jobs, increase local incomes and wealth, and connect the community to the larger, global economy. The recognition of the importance of innovation and SMEs has led to the development of the National Systems of Innovation in several countries. Birch has been at the forefront of the research in this body of work (Birch, 1989; Birch and Medoff, 1994). For instance, Birch (1989) coined the term "gazelle" to refer to SMEs (e.g. "gazelles") operating high



growth businesses are the engines of the economies and provide the majority of new jobs. While much has been researched about high growth SMEs, their roles and importance in the economy, what has been lacking in many of the studies in this stream is the important role that tacit knowledge plays in fueling such growth in the SMEs. Further, there is a dearth of studies relating to the understanding of the types of innovation that SMEs pursue and their impact on performance.

### **2.3. Types of innovation**

What appears to be generally lacking from the innovation and SME literature are studies that explore the types of innovation that SMEs pursue (except for Rizoni, 1991 who investigated the taxonomy of technical innovation in small firms). In contrast, there have been many studies on the types of innovation that large companies pursue. Notable examples include de Brentani's (2001) study on business to business services, a study by Avlonitis et al (2001) on innovativeness in the financial services sector and the PDMA study on new product development practices by Griffin (1997), de Brentani (2001) suggests that the understanding of how to achieve positive product outcomes might be improved by exploring the innovativeness of products that are being developed by firms. Storey and Easing wood (1998) argue that simple augmented service offerings (or incremental service innovations) have the capability to impact a company's profitability and sales but do not offer enhanced opportunities. Cooper and Kleinschmidt (1986) argued that both highly innovative and incremental new products in industrial product firms would lead to superior performance. Many of the innovation studies in large firms revealed that management requirements for managing normal and existing activities and developing incremental innovations are different from those required to develop and manage radical innovations. It has been argued that radical innovations, which tend to

generate very high returns, are more predominant in SMEs compared to large firms (Kanter, 1985; Simon et al., 2002). This is because it is easier for SMEs to make such adjustments compared to large organizations (Kanter, 1985).

At a general level there have been various classifications of innovation types in large firms. Product innovation which may include new product offerings or improvements in existing products appears to be the most common form of innovation among SMEs. Service innovation has become increasingly important. It can be described as new developments in those activities that are undertaken to deliver the core product and is more attractive to consumers.

Another type, process innovation involves creating or improving methods of production, service or administrative operations (Khazanchiet al., 2007) as well as developments in the processes, systems and reengineering activities undertaken to develop new products. For example, to support the manufacture of new products and improve plant competitiveness, process technologies, operational and organizational practices may be upgraded, modified or replaced with new and advanced processes (Jayanathi and Sinha, 1998).

There is also a type of innovation that is often referred to as organization innovation (Abernathy and Utterback, 1978; Trott, 1998). This refers to innovation in management initiatives. Organization innovation is a firm level type of innovation. Previous studies on innovation types and their impact on performance have mainly focused on large firms. This study was therefore focused on SMEs.

Previous studies on innovations and new product development in SMEs have largely focused on product innovations perhaps suggesting that there is a focus on products in

terms of innovations in SMEs (Kanter, 1985; De Toni and Nassimbeni, 2003; Mosey, 2005). Further, previous studies have posited that large firms tend to focus more on product than process or service innovations (Griffin, 1997; Goffin and Pfeiffer, 1999; Avlonitis et al., 2001). This study was to find out whether this assertion would hold for SMEs. Hence one of the objectives of this study is to identify the types of innovation among SMEs in the Volta Region.

## **2.4 The Process of Innovation**

Referring to the “process of innovation” helps to focus the study of innovation implementation in SMEs. Raymond et al. (1998) shows that processual approaches to change implementation can be used with equal validity in SMEs and large organizations. Leonard-Barton (1995) states that the process of innovation requires ongoing maintenance and renewal because the capability to innovate is much easier lost than it is to acquire. Furthermore, the implementation of a process of innovation requires a supportive organizational structure. According to Meyer (1996) and Tidd et al. (2001), an organizational structure must be designed to support innovation. This structural issue is important in SMEs where an owner/manager may have an all-pervasive influence (Choueke and Armstrong, 1998). Tidd et al. (2001) suggest that the most innovative organization tend to be those that develop the most suitable fit between structure, operating contingencies and flexibility. Innovation cannot be seen as the exclusive brief of a research and development or technical department.

The process of innovation in SMEs can incorporate both incremental and radical change. Incremental innovation produces small continual changes and is often visible in organizations in the form of continuous improvement (Bessant and Francis, 1999) or

TQM (Bessant and Caffyn, 1997). Many SMEs have at some point undertaken some form of incremental innovative imitative, often supported by local authority grants. Some of these SMEs consider that the cumulative gains in efficiency are much greater over time than those, which come from occasional radical changes (Raymond et al., 1998). However, many of these short and medium-term gains are quickly eroded and absorbed into the industry standard (Hamel, 2000) and therefore cannot be depended upon as a prerequisite for survival and growth. SMEs innovation pioneer Ken Lewis (Lewis and Lytton, 1997) suggests that his company, Duttin Engineering, practice both incremental and radical innovation. In these SMEs, periods of incremental innovation are interspersed when necessary with radical and transformational change.

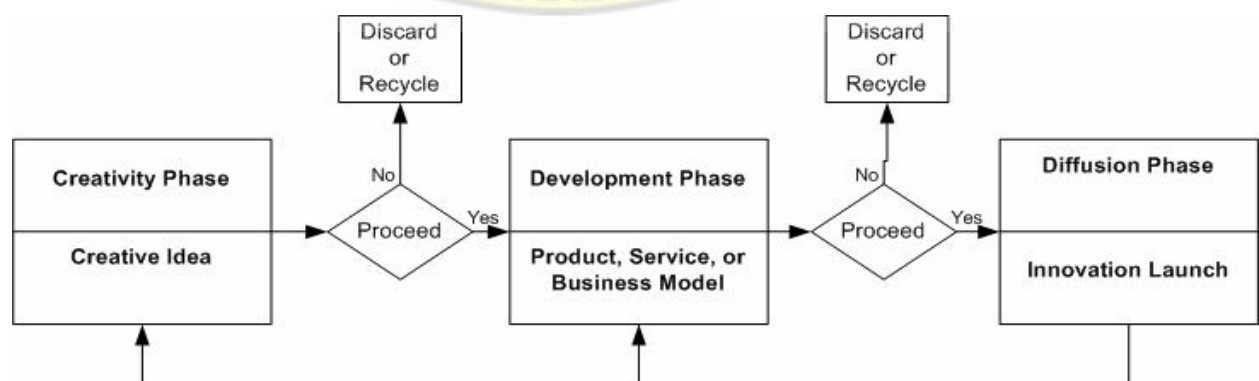
To develop an effective innovation process, SME managers need to focus not only on products, technology and processes, but also on the culture of the organization, its norms, values and beliefs (Gunasekaran et al, 1996). There is a need to develop a climate that is conducive to creativity (Ahmed, 1998), with a strong external focus on multiple stakeholders (Cagliano et al., 2001). The need to understand user needs (Rothwell, 1992) and the importance of culture (Ekvall, 1999) are also consistent themes in the literature. The attention of practitioners and academics have for many years been preoccupied with the quality movement in SMEs, focusing on product and process improvements through an evolutionary incremental process (Ghobadian and Galleary, 1996). There is a need for more studies of innovation implementation, beyond that of continuous improvement (Raymond et al., 1998).

## 2.5 Phases of Innovation Process

The innovation process starts with creating an environment for ideas to flourish and then by capturing and evaluating those through the management procedures that ensure the ideas are successfully turned into products or services. The third supporting pillar of this complete process is innovation diffusion; that is, the process of rolling out and adopting fully developed ideas. Although over simplified this model certainly captures well the division of the innovation activity into its major elements. In bringing good ideas to fruition, however, it is important to note that creative thinkers who originally come up with ideas may not necessarily be the ones to implement them. Creative thinkers quite often lack the discipline required to follow through with an idea. Similarly, those who are successful at transforming an idea into innovation may not necessarily be the ones to market or implement innovation in their own organizations.

Innovation is an incorporated process that evolves in three main phases. Innovating is an iterative process; in other words, every step of the process brings new insights that are used to refine the idea and the final deliverable. This also may aid organizations in dealing with a path dependency problem by critically assessing their choices and if required, abandoning or radically changing the development project.

**FIGURE 1** Phases of innovation process



Source: Adopted from Zvezdan L. (2007)



### **2.5.1 Creativity phase**

The creativity phase is where an innovation trip starts. It is here ideas crop up first as a result of the determined search for opportunities. In spite of the ideas' origin and perceived value proposition, creative ideas and information associated with them should be preserved in a central and common location and made without difficulty accessible to others (Dinsdale et al 2002, Cooper et al 2002). This can help stop people from re-inventing the wheel and can also provide access to ideas whose time might be ripe due to the changing circumstances.

One of the ways to increase the creativity outputs is through a deliberate search for opportunities (Drucker 1985, TBS 1999, Stoyko et al 2006). The most chiefly practiced technique in this regard is through a frequent interaction with stakeholders and customers. Cooper et al (2002) elaborate on building in voice of customers into a deliberate "discovery stage" by interviewing customers, spending time with them in their own work environment and especially, working with lead or innovative customers. This helps maintain similarity between organizations' goals and strategies and the customers and stakeholders' expectations and desires. This "outside in" learning style needs to be properly balanced with a more inwardly "inside out" approach that focuses on the organization's own employees as a continuous source of creativity (TBS 1999). Stoyko et al (2006) provide an exhaustive list of some of the most tried and proved techniques for individuals and teams that might help in generating creative ideas.

### **2.5.2 Development phase**

Creative ideas remain just ideas unless they are implemented. This conversion of ideas to a useful outcome in the form of a product, service or business model happens in the development phase. The development of ideas is not a random process and should not be

left to chance. This is where a good innovation project manager plays a crucial role by ensuring the transition from an idea to an innovation. To achieve that over and over, a systematic and disciplined “idea to launch” process is required to ensure a greater rate of success of innovation. A good, effective system provides for a mix of freedom and discipline. One approach to systematically manage individual innovation projects is a Stage-Gate model. Such a model is used to generate ideas, evaluate them, and move them efficiently and quickly through the development process and into the launch phase. This process is also based on the continuous improvement principles with many loops built into the process to facilitate learning and feedback about the innovation project. It is characterized by the use of a team approach and provides for a systemic, disciplined approach to risk management, project evaluation and decision making.

### **2.5.3 Diffusion phase**

Market's absorption capacity determines the success of innovation (Christensen 2005). For a private service innovator, the market may be internal customers, public in general or a specific social group. Similar to the two previous phases, innovation diffusion should also be a deliberate and well planned activity. A well thought out and executed diffusion greatly increases the chances of innovation's acceptance. In successful organizations, an innovation diffusion execution plan is done up-front even before any development work begins. A good innovation diffusion plan is flexible and accounts for an ever-changing world and evolving social and personal needs and preferences (Moore 2002).

The first step in the diffusion process is awareness of innovation. Choosing an appropriate communication medium to achieve this is crucial. Many different ways of communicating innovation exist; for example, through printed word, verbally, electronically or any

meaningful combination of the three. The best medium choice greatly depends on innovation circumstances and complexity.

The next step involves understanding of customers' needs and preferences. Based on the knowledge of the buying hierarchy marketing model (Christensen 2005) focusing on a product's characteristics (functionality, reliability, convenience and price) and the technology adoption marketing model (Moore 2002) focusing on target customers (innovators, early adopters, early majority, late majority, and laggards), a public sector innovation "marketer" must be able to match the right innovation with the right customer. If successful, the follow up steps involve rolling out innovation to other groups of target customers.

## **2.6 Concept of Knowledge**

Nonaka and Takeuchi (1995) present a comprehensive and detailed account of the philosophical debates from Plato's rationalistic perspective which posits that the physical world is a mere shadow of the perfect world of ideas; to Aristotle's empiricist view that stressed the importance of observation, experience and the clear verification of individual sensory perception. This debate has continued for centuries leading to the permanent attempt to synthesize the scientific (an attempt to formalize workers experiences and skills into objective scientific knowledge) and humanistic (human factors play a significant role in raising productivity through the continuous improvement of practical knowledge held by the worker) views of knowledge. As noted above, discussing and debating knowledge per se is not new, it has been an issue in philosophy for centuries (Dougherty, 1999). Thus creating an accurate definition of knowledge has challenged many researchers (Bhatt, 2000). The attempt to synthesize the two views has added to the challenge.



As a result of this attempt there has been a tremendous interest in knowledge from theories of organizational learning (Agryris and Schon, 1978); resource based approaches to strategic management (Prahalad and Hamel, 1990); to a confluence of conjectures about knowledge society (Drucker, 1995).

From the above positioning the definition of knowledge is taken from Davenport and Prusak (1998:5), as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experience and information”. In a sense, knowledge is “meaning” made by the mind (Marakas, 1999:264). Knowledge is fundamentally about people (Dougherty, 1999). Milton (2005:1) clarifies that “knowledge is something only humans can possess”. It is a personal possession and originates and is applied in the knower’s mind.

Modern research, literature and debate focus on knowledge as being the resource that would enable differentiation and competitive advantage. In the process of identifying this knowledge authors clarify that knowledge is different from data and information. Misch (2003) cites Huseman and Goodman (1999) who note that data constitutes objective facts, whilst information constitutes data endowed with relevance and purpose. Knowledge on the other hand constitutes information laden with experience, truth, judgment and values. Thus there is the suggestion of a hierarchical progression from data to knowledge. Bhatt (2000) indicates that data are raw facts and when being organized they become information. He further clarifies that knowledge is meaningful information. Bhatt (2001) contradicts the notion of hierarchical progression. He also debates that only from a user’s perspective can one distinguish between data, information and knowledge. He indicates that there is a recursive relation between data, information and knowledge rather than a simple hierarchical progression from data to knowledge. Other authors choose to

differentiate knowledge from understanding, wisdom and foresight (Major and Cordey-Hayes, 2000; Rumizen, 2002).

In the business context, we define knowledge as information that is relevant, actionable, and based at least partially on experience. Knowledge is a subject of information; it is subjective; it is linked to meaningful behaviour; and it has tacit elements born of experience. Business theorists have for the sake of convenience, contrasted tacit knowledge with explicit knowledge as if they were distinct categories. In this research the emphasis is that knowledge has something that data and information lack and those extra ingredients are the experience, intuition and heuristics. In the next section knowledge is further broken down into tacit and explicit dimensions.

## **2.7 Types of Knowledge**

### **2.7.1 Explicit knowledge**

Is information that can be described using formal language. It is easily communicated through face-to-face or online mediums (Frappaolo, 2006). Traditionally, it is this type of knowledge that has populated document management systems. Examples of explicit knowledge in an organizational setting include manuals and documentations related to organizational processes and procedures. The predisposition toward explicit knowledge is fixed in the belief that it is easier to summarize, disseminate and objectify (Frappaolo, 2006). More collaborative knowledge management solutions or learning communities tend to focus on the communication of tacit knowledge. Explicit knowledge can be easily communicated through words, graphs and audio-visuals, tacit knowledge is more obscure.

### 2.7.2 Tacit knowledge

Ikujiro Nonaka and Hirotaka Takeuchi (1995) use this distinction to explain how an interaction between the two categories forms a knowledge spiral: explicit knowledge is shared through a combination process and becomes tacit knowledge internalization; tacit knowledge is shared through a socialization process and becomes explicit through externalization. In this article, we build on Polanyi (1967) original, messier assumption: that all knowledge has tacit dimensions. Knowledge exists on a spectrum. At one extreme it is almost completely tacit, that is, semiconscious and unconscious knowledge held in peoples' heads and bodies. At the other end of the spectrum, knowledge is almost completely explicit, or codified, structured, and accessible to people other than the individuals originating it. Most knowledge, of course, exists in between the extremes. Explicit elements are objective, rational, and created in the "then and there" while the tacit elements are subjective, experiential, and created in the "her and now"

Although Spender notes that "tacit does not mean knowledge that cannot be codified", some dimensions of knowledge are unlikely ever to be wholly explicated, whether embedded in cognition or in physical abilities. Semiconscious or unconscious tacit knowledge produces insight, intuition, and decisions based on "gut feel". For example, the coordination and motor skills to run a large crane are largely tacit, as are the negotiation skills required in a corporate meeting or the artistic vision embodied in the design of a new computer program interface.

The common element in such knowing is the inability of the knower to totally articulate all that he or she knows. Tacit knowledge that is embodied in physical skills resides in the body's muscles, nerves and reflexes and is learned through practice, i.e. through trial and error. Tacit knowledge embodied in cognitive skills is likewise learned through experience and resides in the unconscious or semiconscious. While Polanyi (1966)

addressed tacit knowledge at an individual level, others have suggested it exists in group settings. In fact, Richard Nelson and Sidney Winter (1982) suggest that organizations maintain their structure and coherency through tacit knowledge embedded in “organizational routines” that no single person understands completely.

Much knowledge remains tacit for various reasons. Perhaps its explication would not be beneficial. Unless an incentive is created, there is little reason for an individual or group possessing tacit knowledge that provides an important competitive advantage to explicate “away” that advantage. More commonly, however, people are unaware of the tacit dimensions of their knowledge, or are unable to articulate them. Spender notes various types of “automatic knowledge”, such as skilled use of tools (e.g. a computer keyboard) or instinctive reactions ((e.g. catching a falling objects) or “action slips”, as when one starts out to drive on an errand and ends up at the office instead”. In all these cases, the physical and menatal reflexes operate without conscious direction (or without what Polanyi termed “focal” awareness).

Moreover, as psychological research has demonstrated, the acquisition of knowledge can occur through non-conscious processes, through “implicit learning”. That is, we can acquire knowledge and an understanding of how to navigate our environment “independently of conscious attempts to do so”. One intriguing implication is that not only can we “know more than we can tell”, but we often know more than we realize. Furthermore, our efforts to rationalize and explain non-conscious behaviour may be futile, if not counterproductive. Knowledge acquired from implicit learning procedures is knowledge that, in some raw fashion, is always ahead of the capability of its possessor to explicate it (Frappaolo 2006:11). Researchers stimulating implicit learning found, in fact, that forcing individuals to describe what they thought they understood about implicitly

learned processes often resulted in poorer performance than if the individuals were allowed to utilize their tacit knowledge without explicit explanation (Frappaolo 2006:11).

Studies on creativity, intuition, and non-analytical behaviour suggest three ways that tacit knowledge potentially is exercised in the service of innovation. We speculate that they represent a hierarchy of increasingly radical departures from the obvious and the expected, and therefore are of increasing value to innovative efforts. Those companies that effectively identify and communicate employee knowledge gained through experience avoid expenses associated with the reacquisition of this job-related information. Consequently, “tacit knowledge plays a pivotal role in distinguishing companies and poising them for success” (Frappaolo 2006:11). The identification of subject experts is the first step in this process, as tacit knowledge is rooted in personal experience.

## **2.8 Theories of Tacit Knowledge**

Tacit knowledge is the intangible form of human knowledge. Polanyi (1966) presented the first theory concerning tacit knowledge in his book, *Tacit Dimension*. He is the first person who began to draw a distinction between explicit and tacit knowledge. Polanyi (1966) describes tacit knowledge as “very personal knowledge” constructed in a social context. He also asserts that tacit knowledge cannot be expressed in languages as he says: “We can know more than we can tell”. Since then, Nonaka and Takeuchi (1995) recognized the importance of tacit knowledge and tried to demonstrate how to transfer personal tacit knowledge to shared mental models and technical skills. Numerous studies have demonstrated the importance of tacit knowledge in real-world work performance. In much of the literature and industry, tacit knowledge has been emphasized and recognized as an important strategic resource in the development of sustainable



competitive advantage and firm growth (Baumard 1999; Nonaka and Takeuchi 1995; Porter 1985; Sternberg et al. 2000; Sveiby 1997). The research done by Sternberg et al. (2000) showed that much of the knowledge needed to succeed in real-world task is tacit. It is clear that explicit knowledge in general lacks the context required to be truly useful to the knowledge seeker. Nevertheless, firms find it difficult to fully profit from this valuable asset, experts' tacit knowledge.

The distinction between tacit and explicit knowledge has evolved from many different perspectives. Schon (1983) uses a terminology "reflection-in-action" to describe tacit knowledge sharing in a design studio. Rebel (1993) developed the theory of implicit learning based on cognitive psychology principles. He empirically demonstrated that knowledge acquired during learning activities is unconscious and implicit. He also argued that implicitly-acquired knowledge is often partially accessible to consciousness as fragmentary rules to guide behaviour. In business literatures, many researchers develop theoretical frameworks illustrating tacit knowledge sharing: Activity-oriented view (Sachs 1995), personalization strategy (Hansen et al. 1999), interactive architecture (Zack 1999), "Ba" framework (Nakane and Meza 2001), tacitness (Ambrosini and Bowman 2001), brokering model (Gilmour 2003), and network model (Kankanhalli et al, 2003). However, it is obvious that there is little empirical research investigating the role of tacit knowledge in innovation among SMEs.

One attempt to measure the effectiveness of tacit knowledge was performed by Sternberg and his colleagues (Sternberg et al, 2000). Their goal was to show the contribution of tacit knowledge to successful performance and to establish a relationship between the possession of tacit knowledge and job performance. They found that tacit knowledge can be quantitatively measured by using a set of tests. Their method is drawn from the methods of measuring real-world competencies including the use of the critical incident

techniques, simulations, and situational judgment tests. The critical incident technique is an approach that seeks to identify the behaviours associated with effective performance by conducting interviews or open-ended questionnaires. Simulations assess job behaviours by observing people in real job situations. Situational judgment tests assess expertise using a set of tests that asks the best or worst answers for a specific job situation. Their studies also indicate that an individual's level of tacit knowledge is related to the individual's both job and school performance. Specifically, they assert that tacit knowledge can be a source of highly effective performance in the workplace. They also pointed out that the efficacy of tacit knowledge depends on effective acquisition and utilization.

According to the theory of organizational knowledge creation (Nonaka and Takeuchi 1995), the key to knowledge creation lies in the mobilization and conversion of tacit knowledge to explicit knowledge. They point out that innovative change emerges through the interaction of tacit and explicit knowledge. Such interaction is different from a mere combination of discrete pieces of explicit information.

Converting tacit knowledge to explicit often fails because of low awareness of tacit knowledge and the necessity to make it explicit (Stenmark 2000). One of the most extensive research agenda of converting tacit knowledge into explicit forms is expert systems. The original purpose of expert system is to simulate high-level human expertise. Theoretically, expert systems should produce intelligent decisions in every situation. Expert systems are often difficult to extend and enhance once the system is fielded. The knowledge-based system works well only if the system contains enough knowledge from human experts. Feigenbaum (1992) describes the shortcoming of expert systems as “: brittleness” and “isolation”. Researchers in expert systems are beginning to develop the

concepts of interoperability of expert systems in order to connect expert systems in a geographically dispersed environment.

Herschel et al. (2001) argue that converting tacit knowledge to explicit is often time consuming and problematic. Sveiby (1997) also says that knowledge becomes static when tacit knowledge is made explicit through language. This is why tacit knowledge sharing is generally limited to locating experts with the knowledge and encouraging knowledge seekers to communicate (Davenport and Prusak 1998). Tacit knowledge therefore will continue to exist and have serious impact on organizational performance. Ambrosini and Bowman (2001) point out that deeply ingrained tacit knowledge (Type A) is not accessible by the use of languages or codes. Highly tacit knowledge could be only accessed using face-to-face meeting, demonstration, or learn-by-doing strategies requiring the physical presence of knowledge holders.

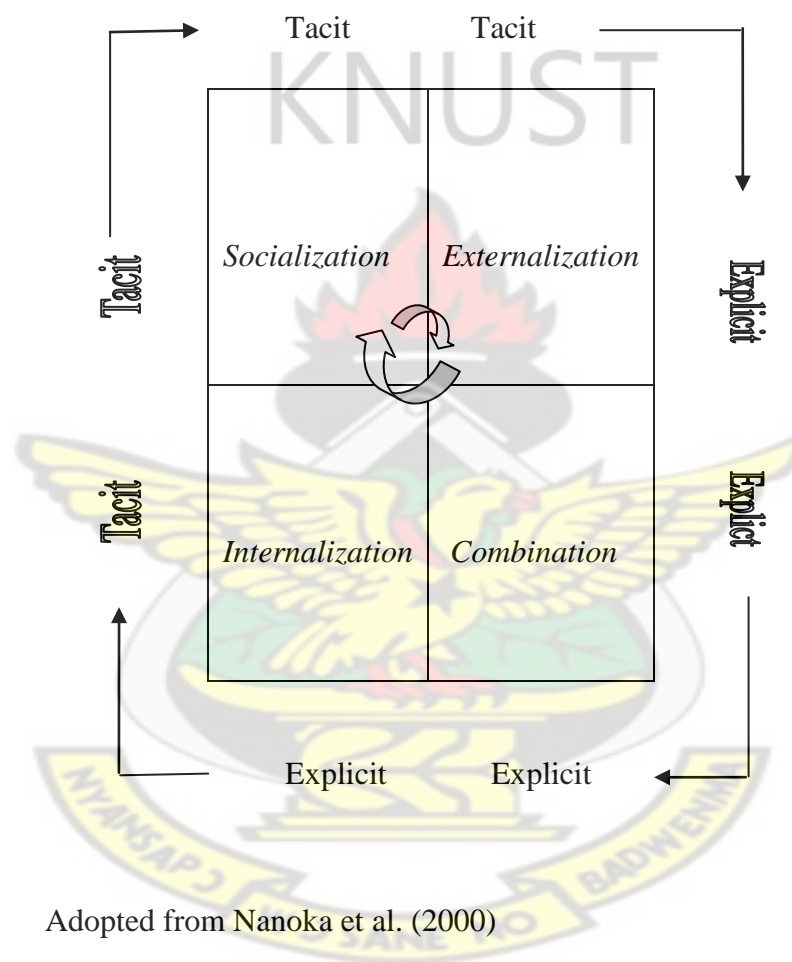
## **2.9 Evolution of Tacit Knowledge**

Basic conditions should exist for the Evolution of tacit knowledge and tacit knowledge creation. Nonaka et al. (2000) come up with the spiral model of knowledge: new knowledge always begins with the individual, e.g. a brilliant researcher has an insight that leads to a new patent or a shop-floor worker draws on years of experience to come up with a new process innovation. In each case, an individual's personal knowledge is transformed into organizational knowledge, which expands through the organization and is valuable to the company as a whole. Making personal knowledge available to others should be the central activity of the knowledge and innovation creating company. It takes place continuously and at all levels of the organization. Through these interactions an organization creates a knowledge process, called knowledge conversion. By Nonaka et al. (2000) there are four modes of knowledge conversion: (1) Socialization (from tacit



knowledge to tacit knowledge); (2) Externalization (from tacit knowledge to explicit knowledge); (3) Combination (from explicit knowledge to explicit knowledge); and (4) Internalization (from explicit knowledge to tacit knowledge). These four modes of knowledge conversion form a spiral, the SECI process.

FIGURE 2: The SECI Process



Source: Adopted from Nanoka et al. (2000)

Knowledge created through this spiral process can trigger a new spiral of knowledge creation, expanding horizontally and vertically across organizations. This interactive spiral process takes place intra and inter organizationally. One example is the articulation of tacit knowledge possessed by customers that they themselves have not been able to articulate. A product works as the trigger to elicit tacit knowledge when customers give

meaning to the product by purchasing, adapting, using, or even not purchasing it. Their actions are then reflected in the innovation process of the organization and a new spiral of organizational knowledge creation starts again (Nonaka 1991), Nonaka et al. (2000). Senker (1993) notes that substantial codification of knowledge in the 20<sup>th</sup> century has not diminished the contribution of tacit knowledge to innovation, and argues that the tacit component of innovation can only evolve through practical experience (learning by doing), or personal interaction with experts who possess the relevant experience or knowledge, in or outside the organization and social networks, meaning the ‘know-who’. A prerequisite for the Evolution, by e.g. installing pilot plants or design and testing prototypes (Madeuf 1984). Interaction with others, as opposed to isolation is important if knowledge conversion is to take place (Stover 2004). Rüdiger and Vanini (1998) express the only way to recognize the subject of tacit knowledge is via personal contacts with external organizations or inside organization, and therefore, it is the duty of the management to support and afford these contacts. Baumard found common characteristics among successful tacit knowledge conversion companies: “resolution of ambiguity through communities of practice; tacit complicity among employees: informal matrices of relationships among employees and reliance on collective knowledge” (Stover 2004:167). We follow these arguments and conclude that the basic conditions for tacit knowledge to be created and shared and used more successful in informal settings than in formal ones. Therefore, it is important for the management of organizations to cultivate commitment to motivate the creation of tacit knowledge, and to create an atmosphere in which organization members in an organization feel secure sharing their knowledge.

## **2.10 Vitalization of Tacit Knowledge**

A precondition to activate tacit knowledge in the innovation process is to make sure that one is able to identify the relevant tacit knowledge in the organization. Rüdiger and Vanini (1998) note that tacit knowledge enables an increased perception of ideas. Therefore, it stimulates creativity and has a positive effect on business activities. The identification of tacit knowledge is often heavily hindered, but is made possible through the scope of personal contacts (Rüdiger & Vanini 1998) where ideas are sharply critiqued but individuals are respected. A group of diverse individuals addresses a common problem; each skilled person frames both the problem and its solution by applying mental schemata and patterns. In a well-managed process, these varying perspectives foster creativity, (which includes tacit knowledge), and this intellectual conflict between diverse viewpoints produces energy that is channeled into new ideas and products (Leonhard & Sensiper 1998).

A popular technique for capitalizing on the respective insights and intuitions (tacit knowledge) of a group of individuals is to conduct brainstorming sessions. Brainstorming sessions should occur at crucial stages in the innovation process and have been shown to lead to important consequences for the organization as a whole (Sutton & Hargadon 1996). Tacit knowledge exists randomly in society and relates to the context of a specific problem. Access is mainly through social networks, or know-how (Imai 1991). The tacit dimensions of individual knowledge are not publicly available except as embodied in people to be hired, and the tacit dimensions of collective knowledge are woven into the very fabric of an organization and can therefore not easily be imitated. Tacit knowledge is made visible through its application and can then be utilized in the innovation process (Leonhard & Sensiper 1998).

Howells (1996) emphasizes that learning is particularly crucial in relation to difficult-to-acquire tacit knowledge, which may explain why tacit knowledge is often identified as being derived primarily from in-house capability and efforts. Tacit knowledge can be activated by generating new scientific knowledge, (learning-to-learn), by incorporating new knowledge in the design of a new product when learning production methods and improving existing technology through minor improvements based on learning-by-doing, and based on learning-by-using once the new product or process is being used internally in the organization or by external consumers (Senker 1993). Tacit knowledge is gained throughout the innovation and production chain of a company and Howells (1996) adds further, that the stage at which tacit knowledge is gained and utilized in the innovation and production process is an important strategy and policy issue. The authors conclude that tacit knowledge is a source of competitive advantage. The creativity necessary for innovation derives not only from obvious and visible expertise, but from invisible reservoirs of experience which need to be vitalized first, before using these in the innovation process.

Tacit knowledge can be gained both in and outside the organization: inside the organization, by deciding what existing tacit knowledge capabilities the members in the organization carry themselves and what improvement could be made to build up the accumulated learning of the individuals and, therefore, enhance the tacit know-how competence. Outside the organization, by trying to gain tacit knowledge and skills from other firms, through recruiting the right individuals with the requisite education or work experience, or by acquiring parts of or whole new companies, or by engaging appropriate consultants or by building networks with other companies. It is made clear that tacit

knowledge is gained and vitalized throughout all functions and stages of a company's operations.

### **2.11 Transfer of Tacit Knowledge**

Another dimension regarding the role of tacit knowledge in the innovation process is the transfer of tacit knowledge. Howells (1996) notes that intuition based on tacit qualities plays an important role in the innovation process which shows that a great deal of the knowledge that is important to the operation or improvement of a given process or product technology is tacit. Tacit knowledge, which cannot be wholly formalized, nor transmitted solely through written documents" (Madeuf 1984:127), a kind of knowledge which is difficult to codify and embody in a blueprint or operating manual. Tacit knowledge is usually part of a long-term, accumulated learning process that often starts a more systematic scientific understanding of a technology or process (Senker 1993:211). The strength and importance of tacit knowledge is that it is often very difficult for competitors to imitate it and, therefore, to be transferred. On the other hand tacit knowledge is often an important element in industrial collaboration, both as a factor initiating collaboration and in its success.

Tacit knowledge is a key factor in the competitive advantage of collaboration and this is the only way that tacit know-how can be transferred and shared (Howells 1996). Hall and Adriani 2002) argue that the major challenge of an organization should be the achievement of balance between the tacit knowledge developed by individuals and the explicit knowledge needed for effective communication and integration, which means to make the bulk of an organization's knowledge explicit and to render the company safe from employees walking away with their personal knowledge (Hall &Andriani 2002). Leonhard and Sensiper (1998) argue against that although it is much easier to stimulate,



combine and communicate explicit dimensions of knowledge than the tacit, there are many situations in which tacit knowledge cannot be wholly converted into explicit. Furthermore a certain level of personal intimacy is necessary to establish comfortable communication of tacit knowledge. This involves recognizing networks of relationships as Scarbrough (2003) highlighted as a critical resource for the combination and exchange of knowledge required to promote innovation and create intellectual capital (Nahapiet&Ghoshal 1998)

Transfer of tacit knowledge strongly depends on the distinction between face-to-face and arm's length relationships (Spring 2003). The closeness of two partners is key to the degree of tacit knowledge transfer (Cavusgil et al. 2003). Much tacit knowledge is gathered and transferred through body language or physical demonstration of skills and therefore, the use of information and communication technology is only partly possible (Leonhard &Sensiper 1998). Nonaka et al. (2000) claim that as tacit knowledge cannot fully be transferred into formal language, electronic storage of tacit knowledge can hardly take place, and if so will lead to loss of knowledge. Barriers to gathering, sharing and transferring tacit knowledge occur if individuals who posses tacit knowledge important to innovation are either actively discourage from participating in the innovation process, or are not involved. To support the knowledge transfer process, Xerox initiated the 'Transition Alliance' to deal effectively with innovations (Cavusgil et al. 2003). In organization where expertise is highly regarded, but mentoring and assisting others is not, people will want the power they gain from being an important knowledge source, especially since sharing tacit knowledge require time devoted to personal contact (Leonhard &Sensiper 1998).



It is clear from the above literature that tacit knowledge transfer requires personal and informal interaction. To support and encourage the application and transfer of tacit knowledge in organizations, managements of organizations should create a working environment which supports respect for different thinking styles without penalties for failure, which discourage experimentation. Management can regulate the level of disagreeing thinking by encouraging an open culture and having less hierarchies in organizations.

## **2.12 The Role of Tacit Knowledge in Innovation**

Innovation, the source of sustained advantage for most companies, depends upon the individual and collective expertise of employees. Some of this expertise is captured and codified in software, hardware, and processes. Yet tacit knowledge also underlies many competitive capabilities – a fact driven home to some companies in the wake of aggressive downsizing, when undervalued knowledge walked out the door.

The wonderful capacity of the human mind to make sense of a lifetime's compilation of experience and to bond patterns from the past to the present and future is, by its very nature, tough to capture. However, it is necessary to the innovation process. The management of tacit knowledge is comparatively unexplored – chiefly when compared to the work on explicit knowledge. Moreover, while individual inventiveness is important, exciting, and even crucial to business, the creativeness of groups is equally important. The creation of today's complex systems of products and services requires the integration of knowledge from diverse national, disciplinary, and personal skill-based perspectives. Innovation-whether it is revealed in new products and services, new processes, or new organizational forms – is rarely an individual undertaking. Creative collaboration is critical.

### 2.13 Conceptual Framework

Typically, innovation process flows from one phase to another although a linear path is not necessarily always followed. Sometimes, different elements of the innovation process might be executed concurrently or a cue might be jumped. Although this may happen for the very justified reasons and is important to maintain that flexibility, it is also crucial to stay as close to the disciplined approach as possible and avoid cutting corners on the key tasks. For the purpose of this study, the linear model was adopted as conceptual framework because linear model of innovation deals more with tangible products rather than intangible objects. And in this research the researcher focus is on tangible products, that is kente weaving and dressmaking.

This model poises the designer as king, where the engineer or product designer dictates the product requirements. The designer pushes the product to market based upon technological advances more than market requirements. In the typical linear model, innovation is represented by a pipeline of sequential processes that starts at the pure scientific research and ends with commercial applications (2004). Savoizet *al.* (19994) depict this process, for a single product as in figure 3.

FIGURE:3 The linear model of innovation



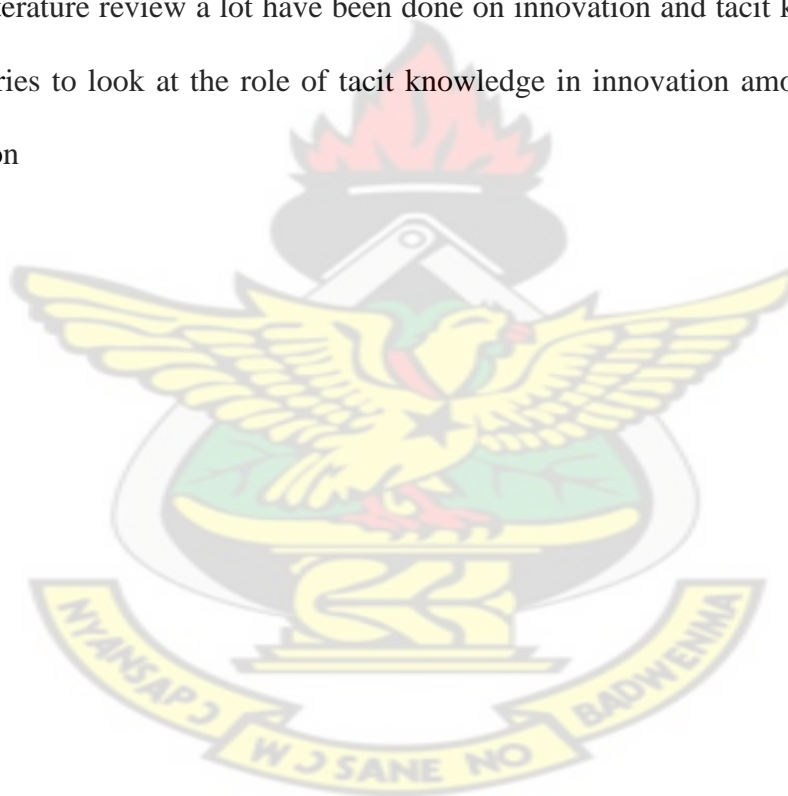
Source: Adopted from Engler (2009).

Collins (2006) likened the linear model to a funnel in which an organization pours a host of ideas into the top and, through a series of research efforts and formal assessment steps, a set of useful innovations emerges out the bottom of the funnel. Collins stated that this model has served some companies well such as Intel with its unforgiving

delivery schedules but has caused other industries such as the pharmaceutical industry to lag behind and even lose large amounts of revenue. Zhang *et al.* (2007) gave a similar description stating that the linear model is based upon the process where scientific and technological advances push a new product to market.

It should be noted that the linear model of innovation deals more with tangible products such as technology rather than the intangible objects of service innovation. Service innovation is more market dictated than product innovation but it may very well still follow the linear model in some instances.

From the literature review a lot has been done on innovation and tacit knowledge hence this study tries to look at the role of tacit knowledge in innovation among SMEs in the Volta Region



## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.0 Introduction**

In this chapter the research methodology was described in terms of design, methods population instruments and procedures used for data collection as well as procedures used during the data analysis. The research design chosen enable the researcher to achieve the purpose and objectives of the study. The purpose of the study was to investigate the role of tacit knowledge in innovation among SMEs in the Volta Region.

#### **3.1 Research Design**

The research design was exploratory as it met the criteria described by Polit and Hungler(1991) because it was designed to gain insight into the situation.

Qualitative approach was adopted to gain insight into people's attitudes, behaviours, value systems, concerns, aspirations, culture or lifestyles. The study was based on survey research in which data was collected once across the population. Purposive sampling which allows the selection of the sample size to be based on the key individuals who can give the information required for the studies is used. This will enable the researcher to sample the views of only those in the fashion and weaving industry.

Respondents constitute people in the garment industry in the Ho Municipality and AdakluAnyigbe District. In Ho municipality the dressmaking industry was considered and in AdakluAnyigbe district the weaving industry was considered. This division was necessary since AdakluAnyigbe is dominated with weaving. Cross sectional studies often employ survey strategy (Rooson, 1991). Guided interview was used. It concern with determining the role of tacit knowledge in innovation among SMEs in the Volta Region.

### **3.2 Population and Sample Size**

Population might be defined as the totality of all subjects that conform to a set of specifications (Polit&Hungler 1995:43). The population in this study comprised all registered SMEs in the dressmaking industry in Ho Municipality and all registered SMEs in the weaving industry in AdakluAnyigbe district. This was so because weavers are more concentrated in the AdakluAnyigbe district.

The sampling approach is a process of selecting a portion of the population to represent the entire population (Polit&Hungler 1991:654).

The sampling approach used in this study was purposive because only the registered SMEs in the dressmaking and weaving industry were considered. Out of the 250 registered dressmakers (Ghana National Tailors and Dress makers Association, Ho Office, 2011) 50 participated in the exercise and out of the 80 registered weavers (Agbenyo Weavers Association, Kpetoe Office, 2011) 30 participated in the exercise. The respondents were all owner managers of the enterprises within the two industries and were selected using convenience sampling that is interviewing any registered member that is available.

### **3.3 Data Collection Instruments**

Data for the study was obtained from both primary and secondary sources. The primary data was extracted from responses from the population using guided interview. This constituted the major source of data for the study. Secondary source was obtained from publication of Registrar General's Department, National Board for Small Scale Industries (NBSSI), and annual reports on business units.

### **3.3.1 Interviews**

The major instrument designed to gather information was interview this instrument was selected as the best alternative for the following reasons. First, the respondents in the study are mostly illiterates and cannot read, understand and write in English. Secondly it allows the questions to be interpreted in the local language and the answers translated back to English. Also it allows the questioning to be guided as you want it and you can clarify points that need to be made clearer much more easily.

Frey and Oishi (1995) define it as "a purposeful conversation in which one person asks prepared questions (interviewer) and another answers them (respondent)" This is done to gain information on a particular topic or a particular area to be researched. Interviews are a useful tool which can lead to further research using other methodologies such as observation and experiments (Jensen and Jankowski 1991). The interview was developed with the aim of finding out the role of tacit knowledge in innovation among SMEs in the Volta Region. The respondents were all owner managers of the enterprises within the two industries and were selected using convenience sampling that is interviewing any registered member that is available.

### **3.4 Data Analysis and Presentations**

From the perspective of Macmillan and Schumacher (1997), Data analysis is a systematic process of selecting, categorizing, comparing, synthesizing and interpreting to provide explanations to single phenomenon of interest. Both descriptive and inferential methods were employed in the data analysis. Frequency distribution, percentage and descriptive analysis evaluating the role of tacit knowledge among SMEs in the Volta Region were employed. The survey data was analyzed by using statistical methods. Statistical methods are a set of Mathematical techniques that allow the researches to make



claims about the nature of world using forms of principles statistical argument (Terre Blanche and Durrheim, 1999).

The qualitative data collected from the field was analyzed using both descriptive and inferential methods, frequencies and percentages. A descriptive analysis was also done using data collected from respondents.

The statistical package for social sciences (SPSS); a computer software program was also used to facilitate analysis of the data into frequency distribution, tables and results. Thus would further be converted in to percentages for discussion.



## CHAPTER FOUR

### DATA ANALYSIS AND FINDINGS

#### 4.0 Introduction

This chapter presents analysis of variables in the interview guide collected from the 80 respondents in the dressmaking and kente industry. In doing this, valuable information relating to the innovation of SMEs and the role of tacit knowledge in the dressmaking and kente industry which impact on the general performance of the organization was analysed. The analysis of data was structured in such a way as to reveal the

1. Type of knowledge used in SME innovations.
2. Type of innovation among SMEs in the Volta Region
3. Role of tacit knowledge in innovation among SMEs in the Volta Region

#### 4.1 Type of Knowledge used in SME Innovations.

According to Davenport and Prusak (1998:5), knowledge can be viewed as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experience and information”. Milton (2005:1) clarifies that “knowledge is something only humans can possess”. It is a personal possession and originates and is applied in the knower’s mind. Knowledge is further broken down into tacit and explicit dimensions.

Explicit knowledge is information that can be described using formal language. It is easily communicated through face-to-face or online mediums (Frappaolo, 2006). Traditionally, it is this type of knowledge that has populated document management systems. Examples of explicit knowledge in an organizational setting include manuals and documentations related to organizational processes and procedures.

Polanyi (1967) defined tacit knowledge as the knowledge that cannot be verbalized, is intuitive and unarticulated. It is knowledge that resides in intuitive realm. Tacit knowledge is embedded in the mind (Choi and Lee, 2003), can be expressed through ability applications; is transferred in form of learning by doing and learning by watching.

To be able to identify the type of knowledge used among SMEs in the dressmaking and weaving industries the following questions were used during the interview to elicit from respondents the type of knowledge that dominates their innovative activities. Questions with regards to; choice of product, knowledge acquisition, training procedures, how they came about innovations, documentation of innovative processes and protection of new ideas help in identifying the type of knowledge used.

#### **4.1.1 Decision Regarding Choice of Product**

The respondents were asked to indicate how they decide on the product that they currently engaged in. Table 1 and 2 below present the distribution of responses for the dressmaking and kente industries.

**Table 1: Decision to Engage In Dressmaking**

	Frequency	Percent
Interest	38	76
Decision of parents	12	24
Total	50	100

Source: (Field Data)

It is clear that the motivating factor for engaging in dressmaking for majority of the people interviewed for this research is personal interest as shown in the table 1. For the others, it was parental decision as one of the respondents said “I was forced in to it by my parents because they could not raise money to send me to secondary school but onhindsight am really enjoying dressmaking as a career”

**Table 2: Decision to Engage In Kente**

	Frequency	Percent
Interest	21	70
Decision of Parents	9	30
Total	30	100

Source: (Field Data)

From table 2, it is clear that most people interviewed as to what motivate their decision to engage in kente production was self-interest. That is 70% of the respondents in the kente industry are motivated through self-interest. Only few are in this industry due to the decision of their parents. For some of this few respondents it was business that runs through the family and is handed down to them from generation to generation. One respondent has this to say “My grandfather was a kente weaver so is my father and uncles therefore it was natural that I became a kente weaver”

#### **4.1.2 Knowledge Acquisition**

The next question was to find out how the respondents acquire the knowledge of the product they engage in. Tables 3 and 4 below were used to interpret the mode of knowledge acquisition.

**Table 3: Knowledge Acquisition for Dressmaking**

	Frequency	Percent
Observation and imitation	6	12
Through apprenticeship	44	88
Total	50	100.0

Source: (Field Data)

From table 3, 44 out of the 50 respondents which are about 88% said they received their knowledge through training in the form of apprenticeship. Only 6 out of the 50 respondents acquire their knowledge through observation and imitations. It is clear that most people in dressmaking acquire the knowledge through apprenticeship.

**Table 4: Knowledge Acquisition for Kente Weaving**

	Frequency	Percent
Through Observation and Imitation	7	23
Through apprenticeship	23	77
Total	30	100

Source: (Field Data)

Table 4 has shown that acquisition of knowledge for kente weaving comes from various sources. The most dominant of all is through apprenticeship by the respondents.

### 4.1.3 Training Processes

Under this section, the research seeks to assess the various training programs that they alluded to in section 4.1.2 above. It would also seek to find out if the training involves reading and writing.

For dressmaking, the training received took the form of hemming, straight sewing, ironing, sewing and cutting; while kente weavers went through spinning, setting and fixing warp into the huddles, as well as, raid, plain weaving and design weaving in general. For all the trainings for the two categories, all respondents agree that reading and writing were not included. The only thing documented sometimes may be measurements of customers and items to be bought for production. Knowledge therefore is transmitted from generation to generation in these industries by verbal instruction. It is clear that tacit knowledge is what dominates the training process.

Tacit knowledge was therefore identified as the main type of knowledge used in the training processes of SMEs.

**Table 5: Duration for Training in Dressmaking**

Year	Frequency	Percent
3	43	86
4	7	14
Total	50	100

Source: (Field Data)

Duration of training program for dressmaking is generally 3 years by responses. From the interview, it was realized that some slow learners made 4 years as shown in table 5 whiles



some fast learners within two years are equipped by the knowledge and skills but stayed for another one year since 3 years was the standard number of years set by this firms for apprenticeship.

**Table 6: Duration for Training in Kente Weaving**

Year	Frequency	Percent
2	4	13
3	19	63
4	5	17
6	2	7
Total	30	100

Source: (Field Data)

From the responses of respondents the duration of training program for Kente weaving is normally 3 years. Some trainees underwent the training for 2 years due to how fast they can learn whiles some others who are slow learners did 4 years and even some 6 years. This clearly shows that though the normal duration is 3 years few made it less than it or more than it.

#### **4.1.4 How new products are introduced**

Another question asked to help determine the type of knowledge used among the dressmaking and weaving industries was how they came about innovations in their various production areas. Responses from the two industries were not different. In both cases imagination and sketches are the means through which they came out with new product and designs. From the responses of the weaving industry they also changed the

colours of the old designs or combine new colours for new designs. One of the respondents from the weaving industry said “I sometimes developed new products and designs through revelation when I slept in the night. I then try to follow my dream by producing miniature designs which I display at my shop to draw customers attention”.

During discussion with the respondents in the dressmaking industry, they also talk about the fact that they look at new styles in magazines and calendar for their production. It is clear that innovation in both industries comes from the individuals mind which is tacit oriented.

#### **4.1.5 Documentation of innovative process**

As to whether their innovative processes have been documented, respondents from both sides appears to be emphatic that they do not have any mechanism of documenting new products and ideas for future purposes; since their work is more of creativity, which bothers more on imagination and picturing. The only kind of documentation that is done is in the form of keeping sample or picture of the new product. This was actually meant for exhibition for people who may be interested in any of them. This also attests to the fact that innovative processes are hidden in the minds of the people and not until they come out with a product one cannot tell what new ideas they have up their sleeve.

#### **4.1.6 Protection of new ideas**

It was discovered that the absence of documentation of their innovative ideas made it difficult for them to protect new ideas. This is because basically products are developed through imaginations. This is the main reason why they also do not think that their work can be protected in any way – so they do not do anything special to protect it.

From the above analyses with regards to choice of product, knowledge acquisition, training procedures, how they came about innovations, documentations and protection of new ideas it is clear that the type of knowledge that dominates SMEs innovation in the dressmaking and weaving industries is tacit knowledge.

#### **4.2 Type of innovation among SMEs in the Volta Region**

Innovation can be better understood as a process in which the organization creates and defines problems and then actively develops new knowledge to solve them (Nonaka 1994). According to (Barnett 1953:7).“An innovation is any thought, behaviour or thing that is new because it is qualitatively different from existing forms”

Innovation is classified in to three general levels. These are Product innovation which may include new product offerings or improvements in existing products, Service innovation which can be described as new developments in those activities that are undertaken to deliver the core product and is more attractive to consumers and process innovation which involves creating or improving methods of production, service or administrative operations as well as developments in the processes, systems and reengineering activities undertaken to develop new products.

To be able to identify the type innovation among SMEs in the dressmaking and weaving industries the following questions were used during the interview to elicit from respondents the type of innovation that they engaged in. Questions with regards to whether there has been an improvement in their performance and areas where they experience this improvement were discussed to identify the type of innovation that exists in these SMEs.

#### 4.2.1 Have you improved in the product you deal with ?

All the respondents in the dressmaking and weaving industry have indicated that there has been an improvement in their production. Respondents from both sides have attested to this with overwhelming yes to the question ‘have you improved upon the products you are dealing with?’

#### 4.2.2 Areas of improvement in Production

With further questions regarding areas they had improvement in their work, the following were discovered.

**Table 7: Improvement in production in the area of dressmaking**

	Frequency	Percent
New Designs	3	6
New Styles	5	10
All the above	42	84
Total	50	100

Source: (Field Data)

Most (84%) of the respondents have indicated that they acquire new styles and designs. Though few of the respondents had an improvement in only one of the two innovative areas it is clear that innovation is generally in the areas of new styles and designs.

In terms of kente the story is not different. All respondents have experience an improvement in terms of new designs and styles.

#### 4.2.3 Introduction of new products to the market

The respondents were also asked to indicate how they introduce new products to the market. This was to find out whether there has been any type of innovation in their services.

**Table 8: Introducing Dresses into the Market**

	Frequency	Percent
Exhibition	43	86
Through Old Customers	2	4
Wear It Myself	5	10
Total	50	100

Source: (Field Data)

**Table 9: Introducing Kente Products into the Market.**

	Frequency	Percent
Moving from office to office to show sample of designs	5	17
Through exhibition	21	70
Through my customers	4	13
Total	30	100

Source: (Field Data)

Tables 8 and 9 above are saying the same thing about product exhibition as the main source of introducing their new products into the market. Other means are through customers and showing samples to people in the open places and offices.

From the analysis above The SMEs do very little in process innovation, which involves documentation of their product. The SMEs interviewed also carry out very little service hence very little expected from them in terms of service innovation. The service innovation identified by this research in relation to the two groups of SMEs could be the marketing strategies adopted by some of them by way of wearing their product to lure potential customers.

The type of improvement and for that matter innovation that was identified in the analysis of the kind of improvement respondent from the two industries experience was basically in the areas of new styles and designs. This falls in line with product innovation, this may include new product offerings or improvements in existing products. This attests to the fact that the type of innovation dominating the dressmaking and weaving industries in the Volta Region is mainly product innovation.

#### **4.3 Role of tacit knowledge in innovation among SMEs in the Volta Region**

Tacit knowledge, which is embedded in the mind, expressed through ability applications and is transferred in form of learning by doing and learning by watching plays an important role in innovation among SMEs in the Volta Region.

From the above analysis the SMEs training programs for the two industries do not involve reading and writing, hence tacit knowledge is the basis upon which knowledge is handed over to trainees. In terms of innovation they would rather imagine and create what they want to do than an act found in literature in the form of explicit knowledge.



Here, Polanyi (1967:4) phrase “we know more than we can tell” would be best to describe these SMEs. There has also not been any documentation of new products and ideas by these two industries for future purposes; since their work is more of creativity, which bothers more on imagination and observation. Hence tacit knowledge is the basis upon which innovative ideas are transformed into products.

The above clearly shows that tacit knowledge plays a major role in innovation among SMEs in the Volta Region.



## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary

The following points summarize the entire analysis;

People interviewed in the dressmaking and Kente industries decide on the profession based on personal interest in the product.

The acquisition of knowledge for dressmaking and kente weaving comes from various sources. The most dominant of all is through apprenticeship.

The duration of training program for dressmaking and kente weaving appears to be mostly 3 years.

Trainings programs for the two categories does not involve reading and writing, hence tacit knowledge is the basis upon which knowledge is handed over to trainees.

The type of innovation that dominates these industries is product innovation. This can be seen in the areas of new styles and designs.

There has not been any documentation of new products and ideas by these two industries for future purposes; since their work is more of creativity, which bothers more on imagination and picturing. Hence tacit knowledge plays a major role in innovation among SMEs in the Volta Region.

There is also no system of protecting their innovative ideas.

Product exhibition is the main source of introducing their new products into the market. Other means are through customers and showing samples to people in the open places and offices.

## **5.2 Conclusions**

The research has identified product innovation as the predominant among the dressmakers and kente weavers sampled. They are more products orientated than process and service. This can be seen in the areas of new styles and designs.

They however do very little in process innovation, which involves documentation their product. This why they introduce new products by imaging the product and then put it into picture form or cut according to an already made one to get their shape and design. The act for dressmakers does not seem to be different for the Kente weavers. They too do some picturing, imaging and, this time, sketching. To get their own taste and desire, they at times have to change the color of the old ones to suit the changing trend. The SMEs interviewed carry out very little service hence very little expected from them in terms of service innovation. The service innovation identified by this research in relation to the two groups of SMEs could be the marketing strategies adopted by some of them by way of wearing their product to lure potential customers.

The type of knowledge used by the SMEs here is purely tacit; this is seen in their response for their motivation to embark on dressmaking or kente weaving. They also would rather imagine and create what they want to do than an act found in literature in the

form of explicit knowledge. Hence, Polanyi (1967:4) phrase “we know more than we can tell” would be best to describe these SMEs.

A good relationship was found between tacit knowledge and innovation in this research. This is why respondents were able to memorize designs and styles yet could be able to produce quality work for the market. Based on this good relationship it is clear that tacit knowledge plays an important role in innovation among SMEs in the Volta Region.

### **5.3 Recommendations**

SMEs would need to be given training that involves reading and writing so as to enhance their recording keeping system.

They should protect their innovative ideas by applying for an intellectual property write which will give exclusive right to use or sell the specific ideas or products they innovated.

Electronic means of marketing their products should also be adopted. The use the internet and other electronic means can help demand and hence productivity.

Their innovative activities should also be improved in the areas of delivery of products to customers.

SMEs should also try to document their innovations since they can only hand down what they remember.

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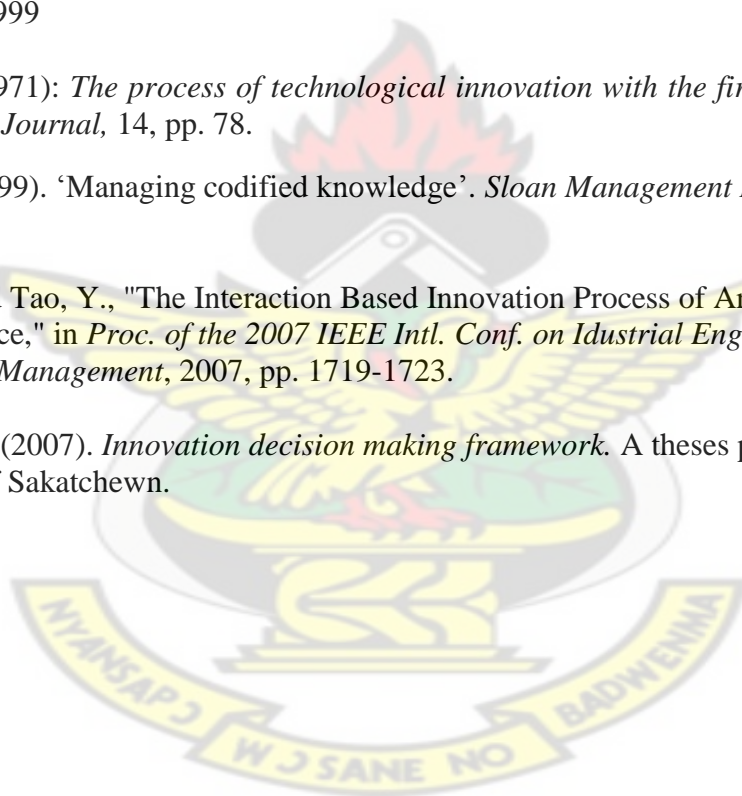
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## APPENDIX

### INTERVIEW GUIDE

1. What type of products are you engaged in?
2. How did you decide on the products that you are currently involved in?
3. How did you get the knowledge of the products you are dealing in?
4. Did you have any training? If yes how long?
5. Give a brief description about the training you had.
6. Did the training you had involve reading and writing?
7. Have you improved upon the product you deal with?
8. How do you introduce new products?
9. Do you write/document the creative processes?
10. If no? Please describe how you recollect the process
11. How do you ensure that the knowledge of your creative ideas is protected?
12. How do you introduce new products into the market?

Other relevant information