KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF DISTANCE LEARNING

EXAMINING THE EFFECTS OF MATERIAL HANDLING PRACTICES ON STORE PERFORMANCE: A CASE OF TERTIARY INSTITUTIONS IN GHANA

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A THESIS SUBMITTED TO THE DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF

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DECLARATION

I declare that this submission is my own work towards the Master of Science (Logistics and Supply Chain Management Option) Degree and to that, to the best of my knowledge, it contains no material previously published by another person or material which has been accepted for the award of any other degree of the University. Except where due acknowledgement has been made

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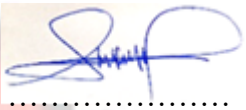

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DEDICATION

Sincerest gratitude goes to God Almighty, my family, friends, and everyone who contributed in various ways towards the struggle of getting this work done.

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I give God all the glory for the strength and will power afforded me to successfully complete this study. A couple of individuals helped in making the completion of this study possible and I am forever grateful, and I dedicate this study to all of them. I cannot be grateful enough to my

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ABSTRACT

Despite the fact that a large number of studies have investigated the relationship between materials handling practices and store performance, there seems to be a striking paucity of literature within the context of Sub-Saharan Africa, most especially studies related to Ghana with

focus on the public sector. This study therefore examined the effect of materials planning practices on store performance among tertiary institutions in Western region of Ghana. The study reveals that the prime reason for the establishment of store management in the organization is to store the materials in a safe, quality and to provide service to the customers, and the study concludes that there is a significant relationship between materials handling practices and store performance. However, it is difficult to generalize that the materials handling practices of the organization under the study was providing services to the customer efficiently and effectively. Of course, some of reasons for poor materials handling practices in the organizations to provide adequate service are; lack of skilled man power, existence of poor shelves, pallets, and racks, lack of minimizing the cost of warehousing activity, lack of following the customer order, lack of giving priority for the safety of item, low level of giving attention to the accident occurred in store, poor information sharing, and lack of appropriately cleaning the storage areas. Finally, as per the multiple regression analyses, the main variables that could affect store performance include; receiving, storage, put away, order picking and shipping of materials handling practices. Hence, organizations are expected to enhance their materials handling practices so as to gain better store performance in terms of quality, response time, cost/financial, and productivity..

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

According to Vrat (2014), materials handling practice were not deemed necessary. However, because of its strategic importance today's businesses are beginning to embrace effective materials handling practices (Silva et al., 2017). Due to the magnitude of the materials held retained and the amount of money invested in them, inventory makes up the majority of a company's current assets. A company's ability to manage its inventory effectively and efficiently is crucial to its ability to develop and survive. Without it, the company risks losing clients and seeing a fall in revenue. Effective materials handling practices minimise depreciation, theft, and waste while guaranteeing that the materials are available when needed (Ogbadu, 2009).

Additionally, efficient and effective materials handling practices supports business survival and profit maximization, which are the primary objectives of every company. More importantly, effective working capital management creates a balance between profitability and liquidity trade-offs through appropriate and timely materials handling practices (Aminu, 2012). It has been demonstrated that certain performance metrics are dependent on the degree of materials handling practices procedures (Lwiki et al., 2013). Huge financial resources are devoted to maintaining inventory levels of this magnitude (Mittal, 2014). As a result, inventory also makes up a sizable portion of working capital. The performance of a business's materials handling practices is a major factor in determining whether it succeeds or fails.

Therefore, materials handling practices should find a balance between having too much inventory and not having enough inventory. Better operational outcomes and a decrease in

working capital investment are both facilitated by efficient management and effective control of materials stored. Materials handling practices should be a part of every organization's overall strategic business strategy because it has a big impact on a company's profitability (Gupta and Gupta, 2012).

The improvement of asset productivity and inventory turns, customer targeting and product positioning in a variety of markets, strengthening intra- and inter-organizational networks, enhancing technological capabilities to produce high-quality products, and enhancing technological capabilities to produce effective inter-firm relationships are all achieved through materials handling practices. Even modest manufacturing units' competitiveness and market share are improved by good materials handling practices (Chalotra, 2013). Superior financial success can be attained by organizations with well-managed materials on hand (Isaksson and Seifert, 2013). The success and expansion of an organization also depend on effective materials handling practices because sales volume and product quality are directly correlated with each other in terms of profitability (Anichebe and Agu, 2013).

But typical service organisations will be the main subject of this study. Materials handling practices is essential to a company's effective and efficient operation. The control of products necessitates their use in production, storage, or exchange for cash. Additionally, it helps the company avoid tying up capital or keeping excessive amounts of shares, both of which have a negative impact on manufacturing enterprises' performance. In order for manufacturing companies to operate effectively, this prevents the incurring of costs related to storage, spoiling, theft, obsolescence, and the need to make objects or goods available when necessary.

Therefore, effective materials handling practices is essential for the smooth operation of organisations including tertiary institutions. Inventory consists of raw materials, unfinished work, consumables, products in transit, and finished goods. However, regardless of the inventory items, they must be handled well because a sizeable percentage of the company's funds are often invested in inventory (Lyndon and Paymaster, 2016). A corporation is not needed to have all of these inventory classes. Any organization's inventory cost management is a crucial decision-making process at every point in the chain of product manufacturing, distribution, and sales. In addition to making up a sizeable component of many organizations' total current assets, inventory can account for up to 40% of industrial enterprises' capital.

Additionally, according to Sawaya and Giauque (2006), inventory can account for up to 90% of a company's working capital and 33% of its assets. Given that inventory makes up a significant portion of a company's assets, it is essential to implement strong materials handling practices practices to assure the organization's expansion and profitability in order to maintain the firm as a going concern. This indicates that the necessary materials are available at the necessary time and are in stock in the proper quantity. To prevent theft, waste, and client loss due to stock-outs, proper and routine checks on store inventory are carried out. Making the appropriate orders for materials stored (purchasing the stocks needed by clients) at all times would encourage high turnover, increasing the organization's profit margin.

Any organization that practices effective materials handling practices avoids low-quality manufacturing, customer dissatisfaction, financial loss, and excellent social responsibility, all of which have an immediate impact on the success of the company (Temeng, Eshun and Essey, 2010). This is accomplished by making sure that finished goods are distributed to the warehouse in production order and that raw materials are delivered on time to the factory. If materials

handling practices is not kept up to par, manufacturing will not be able to fulfill consumer expectations, which will result in revenue loss for the company and very poor organizational performance. Quality of raw materials is the primary determinant of the productive efficiency of any manufacturing concern from the time of purchase to the time of processing.

At light of this, the study examines materials handling practices and its impact on store performance at tertiary institutions in Ghana to make theoretical and practical contributions

1.2 Problem Statement

Any organization depends on its inventory to function (Silva et al., 2017). This is due to the fact that an organization's capacity to properly and efficiently manage its inventory has a significant impact on both its profitability and growth (Vrat, 2014). The real challenge has thus been to identify the best materials handling procedures that integrate seamlessly into an organization as well as the best inventory level where money invested in inventory will yield a higher rate of return than it would if it were invested in other areas of the company (AmoakoGyampah and Gargeya, 2011).

It might be difficult for service companies to decide how much inventory is the appropriate stock to retain. When inventory levels are high, capital is held in an inefficient manner. Operations will be impacted by low inventory levels. However, the purpose of this study is to investigate the link between materials handling practices and store performance at tertiary institutions and to determine how much of an impact materials handling practices has on shop performance (Vrat, 2014).

A supply and use of chain network inventory that is essential to the performance of the company must be planned, carried out, and controlled poorly. Lack of managerial abilities necessary for effective materials handling practices results in inadequate inventory control, which exposes

many institutions to issues like overstocking, damage, and degradation, among others. Economics Order Quantity (EOQ) is needed in an organization since it might be difficult to determine which inventory item should be maintained in stock and in what quantity. This study sheds more insight on how to prevent some organizations from suffering significant losses as a result of their failure to maintain the EOQ that is ideal for them. The issue of not implementing materials handling practices systems; due to poor or no knowledge of materials handling practices, many organizations are unable to stay current with these systems, and as a result, they are inevitably forced to deal with a number of related issues, which this work emphasizes in an effort to address. Additionally, some tertiary institutions have trouble figuring out how much inventory to order and when to order it, which makes it difficult to meet demand and keep daily operations moving forward without unnecessary pauses or downtime caused by the absence of essential resources.

Inadequate human and financial resources, poor supervision and quality control, inadequate materials handling practices expertise, and corruption all contribute to poor materials handling practices. Mostly, institutions in the public sector tend to have this. Therefore, to achieve high store performance in the tertiary institutions in Ghana, there is a need for a proper materials handling practices, which this study is aimed to achieve.

1.3 Objectives of the Study

The general objective of the study is to examine the effect of materials handling practices on store performance of tertiary institutions in Ghana. However, the specific objectives are as follows.

1. To identify the materials handling practices adopted by tertiary institutions in Ghana.

2. To examine the effect materials handling practices on store performance among tertiary institutions in Ghana.

3. To investigate the challenges that mitigate effective materials handling practices among tertiary institutions in Ghana.

1.4 Research Questions

From the specific objectives outlined in the previous section, the study seeks to find answers to the following research questions:

1. What materials handling practices are adopted by tertiary institutions in Ghana?

2. What is the effect materials handling practices on store performance among tertiary institutions in Ghana?

3. What challenges mitigate effective materials handling practices among tertiary institutions in Ghana?

1.5 Significance of the Study

A study to delve into the materials handling practices and its impact on store performance of tertiary institutions in Ghana is one that cannot be overemphasized. A study of this nature would massively contribute to literature in this field especially in Sub Saharan Africa especially from an emerging economy like Ghana.

In addition, the Ministry of Education, Ghana Education Service and a number of institutions and organisations have over the years initiated programmes and activities which they seek to ensure effective store performance is achieved. The research will help them to identify the

materials handling practices that are relevant to organisations in Ghana and how it would impact on store performance.

Among other things too, the study would be of immense benefit to the institutions, and individuals since it would proffer recommendations on how to ensure that their materials are managed well to improve store performance.

In addition, the findings of this study would become a guide for policy makers within the public sector. This is because, the findings of the study would reveal the best materials handling practices practices within the business environment. This information would guide management in making informed managerial decisions on how the affairs of these businesses are run.

So this research will help to determine the impact of materials handling practices on store performance among tertiary institutions in Ghana.

Another relevance of this study is the provision of empirical literature to the future researchers who are also interested in conducting researches in the area of materials handling practices.

1.6 Overview of Methodology

The study adopts a survey research design and a quantitative research approach in an attempt to achieve the main objective of the study. Since quantitative research seeks to objectively investigate a particular phenomenon, the study leverages on a conceptual framework with hypotheses or proposed relationships among the variables of interest. The conceptual model will be tested in a quantitative survey using structured questionnaires to collect data. The questionnaire items will be adopted from extant studies to measure the independent variable, mediating variable and dependent variables. Thus, primary data was the only source of data for the study. Purposive and convenience sampling techniques were used to select a sample of respondents for the study. The data gathered were analyzed quantitatively with the aid of relevant

statistical tools such as frequency tables, measures of location and dispersion among others. Simple linear regression was to test the relationships among the variables. Finally, the data were interpreted and summarized in order to draw conclusions and suggest some useful recommendations.

1.7 Scope of the Study

The scope of this study is to examine the effect of materials handling practices on store performance among tertiary institutions in Ghana. In terms of the context, it is limited to tertiary institutions in the Western region of Ghana. The subjects of the study are top level management staff and store officers of the selected tertiary institutions. However, because of limited resources and time constraints with respect to the researcher, only selected institutions in the Western region of were contacted and selected for this study.

1.8 Limitations of the Study

With every research, there are some limitations that are subjected with the current study being no exception. The main limitation of this study will be the extent of coverage. As has been already mentioned in preceding section, the study will not cover the entire country as the researcher is constrained with time and financial ability. As a result, the study will be limited to selected tertiary institutions in the Western Region of Ghana. Since the unit of analysis is top executives of the selected tertiary institutions, there would be instances where some of the respondents may show apathy to filling the questionnaires administered to them. There will also be instances of unfilled spaces in the questionnaire returned to the researcher. However, these limitations will not affect the research quality in terms of validity and reliability.

1.9 Organization of the Study

This thesis is structured into five (5) chapters.

Chapter one comprises the introduction which focuses on the background of the study, problem statement, research objectives, research questions, significance of the study, overview of methodology, scope of the study, limitations of the study and organization of the study. Chapter two presents a literature review which focuses on definitions and overview of key concepts and variables in the study. Also, a theoretical review is conducted which focuses on the theories that underpin the relationships among variables in the study as well as empirical review which focuses on review of extent studies related to the subject matter.

The methodology of the study is provided in the Chapter three of this study. The research design, population of the study, sample size and sampling technique, research instrument, data analysis tools and the profile of the research context are provided in the methodology.

Questionnaires are developed and administered to tertiary institutions in the Western region of Ghana. The data analysis and research findings are provided in Chapter Four. The questionnaires that were administered to institutions are examined and analyzed critically in this chapter. Information on the demographics are presented together with key descriptive statistics. Chapter Five which the last chapter of the study provides the summary of findings, conclusions drawn and recommendations for theory and practice as well as suggestions for further studies.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a scholarly review of past studies related to materials handling practices and store performance. As such, it reviews concepts, theories, and empirical studies on the key variables of the study. These have been captured in the next sub-sections in line with the study.

2.2 Conceptual Review

This section reviews the key variables of the study such as materials handling and store performance including definitions, overview, roles, among others. These have been reviewed in the next sub-sections.

2.2.1 The Concept of Materials Handling

Materials handling has become an important activity of the supply chain principally for the reason that, it is often impossible for suppliers to effectively meet the lead times required by customers, hence these customers need to be served from inventory rather than from direct order (Harrison and van Hoek, 2005). Additionally, it is prudent to hold strategic inventory at designated points in the supply chain to separate lean manufacturing activities from the downstream agile response to volatile market places (Christopher and Towill, 2001).

Alternatively, supply and distribution networks may be of sufficient complexity that, there may be the need for goods to be consolidated at inventory holding points so that multi-product orders for customers can be delivered together (Higginson and Bookbinder, 2005). The operations of such warehouses are critical to the provision of high customer service levels and they need to achieve this reliably within high tolerances of speed, accuracy and lack of damage (Baker, 2004).

With this critical impact on customer service levels and logistics costs, as well as the degree of complexity involved, it is thus imperative to the success of organizations that warehouses are designed to function cost effectively (Rouwenhorst et al., 2000). It is further important to assert that, because materials handling and material handling work hand-in-hand, it is imperative to properly and appropriately handle material designated for future use to ensure that they efficiently support operations for which they are meant to execute (Childe, 2003).

This means that without a well-designed and functional material handling system, manufacturing operations could encounter delays; production times could increase; products could get damaged or contaminated; and cost of movement within facilities could increase, thereby increasing operating cost. On the other hand, a well thought-out and planned material handling system could help manufacturing and logistics facilities improve their productivity, enhance products' quality, and reduce operating costs (Hassan, 2006).

Indeed, in order to promote effective and efficient material handling operations, the Material Handling Institute (MHI, 2000), has proposed what has become known as the "Ten Material Handling Principles". These principles are stated and explained as follows:

2.2.1.1 Planning

According to the planning principle, all material handling operations should be the result of a well thought-out plan where the needs, performance objectives, and functional representation of the proposed methods are completely designed at the outset.

2.2.1.2 Standardization

The standardization principle states that material handling methods, equipment, controls and software should be standardized within the limits of achieving overall performance objectives and without sacrificing needed flexibility, modularity and throughput.

2.2.1.3 Work

The work principle suggests that, material-handling tasks should be minimized without sacrificing productivity or the level of service required of the operation.

2.2.1.4 Ergonomic

The ergonomic principle arguably one of the most important, stresses that human capabilities and limitations must be recognized and respected in the design of material handling tasks and equipment to ensure safe and effective operations.

2.2.1.5 Unit Load

The objective of the Unit load principle is to ensure that unit loads are appropriately sized and configured in a way that achieves the material flow and inventory objectives at each stage in the supply chain.

2.2.1.6 Space Utilization

Effective and efficient use must be made of all available space. The key points of this principle are that, in work areas, cluttered and unorganized spaces and blocked aisles should be eliminated. On storage, the objective of maximizing storage density must be balanced against accessibility and selectivity. Further, the principle suggests that when transporting loads within a facility the use of overhead space should be considered as an option.

2.2.1.7 System

The system principle emphasizes that material movement and storage activities should be fully integrated to form a coordinated, operational system which spans receiving, inspection, storage, production, assembly, packaging, unitizing, order selection, shipping, transportation and the handling of returns.

2.2.1.8 Automation

The automation principle advocates that material handling operations should be mechanized and/or automated where feasible to improve store performance, increase responsiveness, improve consistency and predictability, decrease operating costs and eliminate repetitive or potentially unsafe manual labour.

2.2.1.9 Environmental

Environmental impact and energy consumption should be considered as criteria when designing or selecting alternative equipment and material handling systems. This ensures that very little or no harm is done to the environment during material handling operations.

2.2.1.10 Life Cycle Cost

A thorough economic analysis should account for the entire life cycle of all material handling equipment and resulting systems (MHI, 2000).

These "Ten Key Material Handling principles" seek to transform the handling process in ensuring safety, efficiency and optimization in manufacturing/production. Effective compliance to the principles for instance could ensure that heavy loads are properly and appropriately handled to minimize practitioner injury; large volumes of different items are handled without damage or loss thereby saving costs; and order picking, packing and inventory tracking would be done with little or no errors. In order for these propositions come to fruition, manufacturers and users must

be careful when designing and implementing new systems that seek to enhance efficiency in material handling (Furmans, et. al., 2010).

2.2.2 Integrating Technology into Materials handling and Material Handling Operations

The rapid evolution of materials handling and material handling operations especially in the area of technological integration makes it imperative for organisations to either adapt to modern trends of doing business or risk being crowded out. Technologies like Warehouse Management Systems (WMS), Radio Frequency Identification (RFID), Automated Guided Vehicle System (AGVS) among others, have transformed and revolutionalised the landscape of materials handling and material handling across parts of globe.

For instance the RFID uses radio waves to exchange data between a reader and electronic tags attached on objects. The data on the tags can be read and written to facilitate the identification and tracking of the objects in warehouses (Chen et. al., 2013). The RFID has attracted significant attention in the fields of logistics and supply chain because of its effectiveness and efficiency (Hunt et al., 2007) in tracking goods throughout the supply chain and also as one of the new technologies influencing the operations in production, materials handling, and distribution sectors (Chen et. al., 2013).

The AGVS is a material handling system that uses independently operated, self-propelled vehicles guided along defined pathways in the facility floor. It is an automated material handling system, which moves along predefined and pre-programmed path along an aisle from one station to another. The main parts of an AGVS include structure; drive system, steering mechanism, power source (battery) and onboard computer for control (Aized, 2006).

Research has shown that, the WMS and RFID technology are integrated at three levels thus, data collection, data movement and data management (Tan, 2008). According to Tompkins and Smith (1998), a computerized WMS represents a tool that can facilitate the automation and optimization of material handling processes; improve inventory accuracy and facility usage; reduce labor costs; and enhance order-picking accuracy.

A WMS is therefore a key part of logistics and supply chains as it aims at controlling the movement and storage of materials within warehouses. The system also directs and optimizes stock putaway based on real-time information about the status of bin utilization (Arora, 2009). The objective of a WMS is therefore to provide a set of computerized procedures to handle the receipt of stock and returns into a warehouse facility; model and manage the logical representation of the physical storage facilities; manage the stock within the facility and enable a seamless link to order processing and logistics management (Arora, 2009).

It is significant to acknowledge that, an automated warehouse forms an integral part of sustainable materials handling because it often reduces operational costs. A thoughtfully planned automated system leaves little or no wastes. All types of goods maintained in a warehouse or distribution center are carried out through automation systems with the assistance of conveyors and overhead pulley systems (Garcia et. al., 2003).

Computer systems are placed in strategic locations to facilitate the movement of these goods from bulk storage area to the next activity areas of the warehouse. It is further justified to state that current developments in material handling operations are leading to automated systems that move faster, accommodate greater throughput, and require less maintenance (García, et. al., 2003).

2.2.3 Manual and Mechanical Material Handling Operations

According to the University of California's DAVIS Safety Services (2015), material handling is classified as manual when it involves the use of absolute physical labour in lifting, lowering, and carrying objects. It is important to indicate that, in manual handling if ergonomic principles are ignored, there is a high probability of strain on the muscles, joints, and disks in the back which could eventually lead to injury.

For this reason, it is advised that objects that are too heavy or bulky for safe manual handling by employees should be lifted and moved by mechanical lifting devices. Moving raw materials and finished products through a facility is a common process in the manufacturing industry. Throughout that process, operators with various manufacturing tasks routinely lift/lower, push/pull and carry objects, where risk factors sometimes leading to musculoskeletal disorders (MSDs) may occur (Batish and Singh, 2008). It is imperative to stress that, although technology has advanced industrial production techniques, manual handling of materials have remained essentially the same.

Most jobs require some manual handling, but about 10 per cent require extensive manual material handling (Texas Department of Insurance, Division of Workers' Compensation (TDI, DWC, 2009). While emphasizing that manual material handling is required in most operations, it is significant to stress that sometimes a material handling operations could be executed either completely manual or automated. The level of mechanization is classified with respect to the degree of practitioner involvement and computer applications in operating equipment. With regards to mechanized operations, mechanical means instead of physical effort is used for driving the equipment. Trucks, conveyors, and cranes fall into this level. Accordingly, operators are

needed for operating the equipment as opposed to using physical strength. As the degree of mechanization increases, there is system complexity, which results in improved efficiency but increases design and operating costs (Groover, 2007).

Mechanized material-handling equipment is mostly used by organizations to attain higher efficiency and improved productivity at a relatively lower cost. Although mechanical handling creates a new set of hazards, the net result is fewer injuries, lower workers' compensation expenses, and a more productive workplace (TDI, DWC, 2009).

2.2.4 Materials handling and Material Handling Hazards

In 2017, the National Safety Council (NSC) of the United States reports that materials handling and material handling accounts for 20% to 45% of all work related injuries. Further, research has shown that the most susceptible parts of the body prone to materials handling and material handling injuries are the human toes and fingers. Based on this evidence, the NSC proposes that it is imperative for practitioners and handlers to wear protective accouterment in order to minimize the risk of injuries that occur at every facet of operations (NSC, 2017).

Further, the Occupational Safety and Health Administration (OSHA), postulates that materials handling and material handling practitioners suffer from excessive back injuries. These back injuries according to the OSHA, accounts for almost 20% of workplace injuries, which results from lifting, lowering, pushing, pulling, carrying material and twisting the body. Experts put the annual cost of back injuries at between $20 billion and $50 billion US dollars.

While acknowledging weight a major cause of back injuries, it is prudent to stress that weight is not the only factor that causes back problems. Other factors include: bending, stretching, and handling large and awkward loads, carrying loads over long distances or for long periods of time,

among others (TDI, DWC, 2009). Frazer (2003), reports that, practitioners or handlers who exceed the maximum permissible limit (MPL) are at risk of increased musculoskeletal injury rates. This conclusion is grounded on the basis that in reality only about 25% men and a little below 1% women workers have the muscle strength to be capable of performing work above the MPL (Seo, 2016).

Another important cause of materials handling and material handling injuries is the use of inexperienced or untested employees. This happens because of their low levels of experience and lack of practical expertise to handle various demands and techniques of tasks assigned to them. Although training is a major component of injury management and prevention, it is important that the work environments as well as working conditions are improved in order to reduce the risk of workplace injuries. According to the National Institutes of Occupational Safety and Health (NIOSH), "the best way to protect workers is through ergonomic approaches designed to reduce the hazards of lifting". This new line of thinking incorporates advanced ergonomic trends in materials handling and manual material handling operations (TDI, DWC, 2009).

2.2.5 Store Performance

A storage assignment policy determines the allocation of products to storage locations and impacts the load retrieval time of the storage system (Roodbergen and Vis, 2009). Ekren et al. (2015) study the best rack design when an ABC policy is applied to SBS/R systems to maximize utilization of lifts and shuttles and reduce cycle times. Yu et al. (2015) prove that the FTB policy is not optimal if the total required storage space does not equal the average inventory level of all products. In fact, given a finite number of products, a small number of storage classes already results in the minimum picking travel time. More storage classes require extra storage space.

Weidinger and Boysen (2018) propose a scattered allocation that spreads product units in the warehouse to increase the likelihood of having some items located nearby.

Performance refers to the way in which work is done. There can be a good performance or a poor one (Liviu, Ana-Maria and Emil, 2009). As stated by Frazelle, warehousing is one of the factors which are responsible for business competitiveness. Businesses compete on the basis of financial, productivity, quality and cycle time performance. So it is important to hold warehousing accountable for these activities to go smoothly. There are four quality indicators for store performance two of which for inbound handling and the other to for the outbound handling of products, these indicators are Put away accuracy (the percent of items put away correctly), Inventory accuracy (the percent of store locations without inventory discrepancies), Picking accuracy (the percent of order lines picked without errors) and Shipping accuracy (the percent of order lines shipped without errors) (Frazelle, 2002). Venul (2013) in his study identified that four factors affect store performance, and these factors are long lead time, poor store layout, irregular deliveries, and improper forecasting of demand (Venul, 2013). Yu and De Koster in their study discussed the concept of dynamic storage, which can improve order throughput and reduce labor cost simultaneously due to shorter travel in picking tours (Yu and De Koster, 2010). According to these two studies store performance store performance is affected if the storage practice is not as efficient as supply chain system expects.

For describing the store performance and improvement, we should have to perform a process mapping. It is a useful way of depicting all activities that take place in the store. Generally, a company's store operations can influence the firm's corporate performance in manners such as receiving, storage and shipping (dispatching) in relation to quality, cost, speed and productivity. Receiving, storage as well as picking and shipping has their own cost, quality such as perfect

order fulfillment incorporating accuracy and response time as speed should be measured and continuously improved.

2.3 Theoretical Review

A theory is a hypothesis or a set of ideas intended to explain something, especially one based on general principles unrelated to the explanation's subject. Two theories that support this study are the resource-based view (RBV) and transaction cost economics (TCE), which are described in this section.

2.3.1 Resource-Based View Theory (RBV)

A resource refers to a company's entire set of tools for increasing output or profit, including plant, labor, raw materials, and assets (Clark, 2007). As a result, this theory is utilized to solve the question of why enterprises in the same industry perform differently over time. Why, on the other hand, do certain companies continually outperform others? According to Porter (1982), the value chain concept was developed to explain why certain organizations have a competitive advantage over others. This is because internal capabilities and resources provide a competitive advantage when a company emphasizes the resources worth, uniqueness, imperfect imitable character, and non-substitutable nature, according to RBV (Miles and Covin, 2010). These resources can be defined as tangible or intangible resources and can include assets, capabilities, organizational procedures, or information (Dickinson et al. 2010). Theoretically, resources that are completely managed or owned by the focal organization should be nurtured in order to improve their contribution to the firm's competitive edge in its industry (Hoffman and Sandilands, 2005). This theory connects the research variable where we want to know if there is any effect on firm performance after adopting green production (Li and Geiser, 2009).

If the number of institutions in a competitive arena owning a resource is smaller than the number of institutions required to generate ideal competition, the resource is uncommon (Pfeffer, 2003). In this regard, factories that have implemented eco design that is distinctive in nature may be in a better position than others (Hooley and Greenley, 2005). Core competencies indicate what a corporation can accomplish better than others. Competencies describe what a company can do well (Prahalad and Hamel, 1990). Lawson and Lorenz (Lawson and Lorenz, 1999). In the resource-based view, allocating resources to non-core tasks results in opportunity costs.

This is especially essential in the tertiary institutions when it comes to materials handling practices. A company that can effectively use its resources to its advantage can obtain a competitive advantage.

2.3.2 Strategic Choice Theory

The theory looks at the interaction of the actions of an organization and events (De Rond and Thietart, 2007). An integrative approach of the Strategic Choice Theory is important in risk management. For example, by emphasizing on cross-functional integration in organizations (Jemison, 1981). The Strategic choice theory represents the relationship between risk management, choices and organizational performance and the environmental/, organizational interaction. It stresses the importance of managerial risk management options and practices (Child, 1972). It views organizations as partly influenced by their environment and affected by the choices they make to control environmental the disturbances (Miles et al., 1978).

Strategic choice theory has an integrative approach and views businesses entity adaptability, which learn over time. Their strategic options therefore lead to actions that management direct (Child, 1997). Strategic type of organizations, Analyzers, Defenders or Prospector therefore determine the way managers and organizations operate in unpredictable events and situations.

According to the strategic choice theory prospectors, proactivity and innovation is the guiding principle (Nollet et al., 2005). They produce internally sometime, they alter their product range. The defenders pursue procurement of the items through established suppliers so as to ensure efficiency in the production while developing a stable mix of products (Shook et al., 2009).

2.3 Empirical Review

Previous studies and researches in the area explained results they found from different perspective/practices. Some of the research findings related to warehousing activities aresummarized as follows.

Sneha and More (2016) finds out in her study of efficiency and effectiveness of Store Management that, as a result of global competition and supply chain concepts, including a focus on integral inventory control, warehousing has become a critical activity in the supply chain to outperform competitors on customer service, lead-times, and costs. Timely and accurate information about products, resources and processes are essential to operationalize a planning and control structure that effectively and efficiently achieves the high performance of store operations required in today's marketplace. The author also showed that store complexity affects the planning and control structure through the comprehensiveness of the work to be done.

In highly complex stores, feeding organizational actors with the right type of information and knowledge at the right time is difficult. Nonetheless, a complex warehousing operation requires a control structure that has a great deal of information, data, and knowledge about products, processes, customers, and resources readily available. Thus, Optimization strategies are utilized to position product availability and delivery as a competitive advantage while also optimizing

the cost trade-offs associated with transportation, facilities, equipment, workforce, and other critical cost variables. The distribution center also provides time-saving utility by storing product until it is demanded.

Shah and Khanzode, (2017), identifies the tradeoffs between picking efficiency and order responsiveness could be studied with different stochastic issues (worker overtime, earliness, tardiness, penalty, order due date, costs, etc). In addition, many studies have been found solely for picking efficiency, but the integrated model including responsiveness may provide better results.

Karim et al. (2018) show their result of on failure factors of store productivity as; to sustain economic development, the warehousing industry must be focused on positive action that should be supported by everyone at all levels of government, private and nonprofit organizations as well as the people. Therefore, suggestions and recommendations on store productivity performance will directly influence development to a higher level and boost competitiveness in the logistics service sector. However, these warehousing and storage strategies will be beneficial when everyone participates consistently, endeavors to innovate and improve productivity, and increases the efficiency of warehousing operations.

Habazin et al., (2016), provide their recommendation in the study of the Order Picking process in stores" that every process, from receiving until shipping as well as order picking is also the one that accounts for the majority of store operating costs and requires the most performing time. Once the picker starts gathering products from orders, they walk, move, lift, put, pack and do other related works, which take time and, in that way, become costs. To perform a suggestion of a solution, the order picking process has been analyzed, regarding detailed process flow and time

dedicated for its performance. In accordance with its status, it has a possibility of being reduced by different strategies. Companies willing to optimize their processes tend to measure them but also tend to have an objective view on the core process structure. To be open to change and to be continuous in evaluation is a crucial matter for any process optimization.

In addition, the authors also suggest that, after a detailed analysis, observed on broad data that include seasonality, KPIs, types of goods, performance and the structure of any kind of store process, it can be well modified. By optimizing order picking as proposed, it is considered that the processes would run more efficiently. The optimization includes predefining WMS data and reorganization of dedicated storage locations directly influencing the time-consuming order picking, which is presented with the proposed changes in the observed company's store layout. The evaluation of effectiveness of a certain process, such as order picking, should be constantly supervised in the form of analysis and chronographically measured to be controlled and reduced.

Atieh et al. (2016) examines the main purpose of automating the store system is to control the movement and storage of the products, together with the benefit of enhanced security and quicker handling. The newly created software upgraded the capabilities of the store management system. Currently, the stored data can be organized according to serial number, activated easily assuring the FIFO concept, and handed to the dealers accurately with the least number of possible errors.

Van den Berg (2012) reflects in his study of highly competitive store management that excellent store performance helps companies to create competitive advantage by reducing logistics costs, by increasing internal and external customer service levels, and by aligning business activities. Research shows that best-in-class companies realize competitive customer service levels while

achieving logistics costs advantages of 20 to 30 percent over their laggard peers. Moreover, these companies are financially more successful.

2.4 Conceptual Framework

A conceptual framework is a widely defined and methodically arranged notion that serves as a focus, justification, and instrument for the integration and interpretation of data (Elsevier, 2008). The relationship between the independent variable and the dependent variable is depicted in Figure 2.1. As can be observed from the framework, materials handling practices is the independent variable, with store performance as the mediating variable respectively. The dependent variable, store performance, has been conceptualized as an aggregate of four subpractices namely reliability performance, efficiency performance, flexibility performance and cost performance.

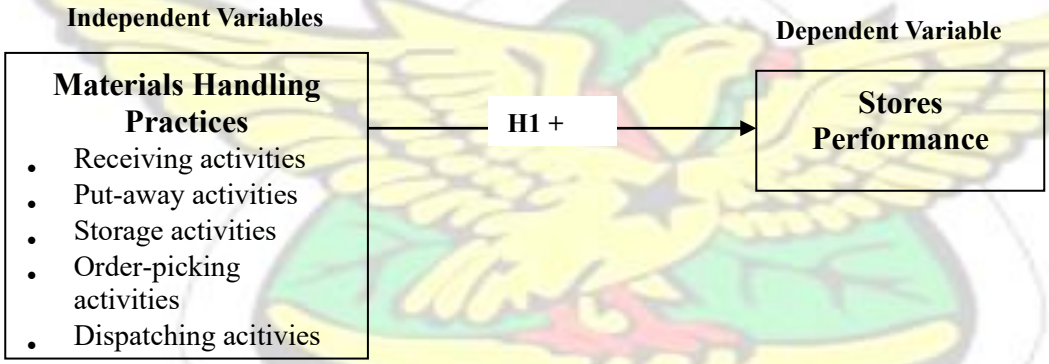

Figure 2.1 Conceptual Framework of the Study

Source: Author's Construct, 2022

2.4.1 Materials Handling Practices and Store Performance

Christopher and Lee (2001) and Finch (2004) identified various factors that hinder risk mitigation. These include; lack of trust among supply chain members which makes it difficult for them to share information.

It also includes lack of a clear revenue sharing arrangement hence there is no incentive to work towards a common goal. Another factor identified was adversarial competitive relationships; this type of relationship seeks to reduce the prices for goods and services. In past studies, organizations like HP, ZARA minimized their risks of exposure to themselves and their supply chain stakeholders through transforming their supply chains to be agile entities (Prater et al, 2001). It is proposed, based on the preceding argument, that;

H1: Materials handling practices has a significant and positive effect on store performance.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The methodology that was used to conduct the study is presented in this chapter. According to Cavana et al. (2001), research methodology follows a process including the research design, type

of investigation, level of researcher interference, study context, unit of analysis, and research time horizon. The study population and sampling design, data sources and data collection methods, data analysis methods, validity and reliability testing, and how ethical issues were addressed throughout the research process were all covered in this chapter.

3.2 Research Design

The research design of a study refers to the basic method for acquiring information on the research topic, with special attention to the various sources from which data will be gathered for the study (Saunders et al., 2016). A social science study can be conducted in a number of different ways. Popular types of study include case studies, surveys, experiments, ethnography, grounded theory, and archival research. In this inquiry, the survey method was applied. The data was gathered in a cross-sectional fashion, which means that the author only collected information at one moment in time.

A survey, according to Zikmund et al. (2010), is a research approach in which a group of people is polled or their behavior is observed and described in some way. Because the researcher intends to use a structured questionnaire to collect information from a non-partial sample of tertiary institutions in order to investigate how materials handling practices affect store performance, the survey method was chosen for this study.

The study solely looked at tertiary institutions in the Western region in Ghana. Each researcher gathered data from at least 200 respondents using a data online questionnaire. Data gathering zones were properly designated to decrease the probability of receiving repeated responses from a single respondent. Different research approaches have been explicated and categorized differently by various authors (Yin, 2003; Saunders *et al.*, 2016). This study however employs a

mono method in its investigation. A quantitative approach was employed to examine the perceptions of store officers of tertiary institutions in Ghana.

3.2.1 Research Purpose

All research can be classified into one of three categories according to its objective: exploratory, descriptive, or explanatory research (Cavana et al., 2001; Saunders et al., 2016). Grounded theory is a flexible approach to theory formulation based on general principles such as theoretical saturation, constant comparison method of analysis, and theoretical saturation (Saunders et al., 2016). The exploratory research design also aims to learn more about the unique characteristics of a problem.

The purpose of descriptive research, on the other hand, is to disclose an accurate profile of events, people, or circumstances (Saunders et al., 2016). Both an extended form of exploratory and a component of explanatory research design can be related to descriptive research (Cavana et al., 2001). The purpose of an explanatory study is to establish a relationship between studies and variables, which means that the goal is to investigate circumstances or problems in order to discover a relationship between variables (ibid). Cooper and Schindler (2003) categorize research as giving data and information for the purpose of reaching certain findings (reporting), describing, and identifying a phenomenon (descriptive), and attempting to explain a phenomenon (explanatory) (predictive).

The major goal of this research is to delve into the tertiary institutions in the Western region of Ghana and examine relationships between materials handling practices and store performance. The use of explanatory approach was required due to the peculiarity of the study's specific objectives. Explanatory research is conducted at this stage of the investigation to explain links

among major variables that have been established as hypotheses within the theoretical framework.

3.2 Population of the Study

According to Robson (2011), a research population is a group of people or things who share one or more characteristics and can be used to collect and analyze data. The study's target demographic comprises all tertiary institutions in the Western region of Ghana. As a result, because there is no sampling frame, the population size is unlimited, and the study concentrates on top managers as respondents.

3.3 Sample Size and Sampling Technique

According to Robson (2011), a research sample is a tiny portion of a research population that is supposed to be representative of the entire population. The process of studying a representative number of individuals or things from a large community is known as sampling (Saunders et al., 2016). According to them, sampling techniques offer a variety of strategies for researchers to limit the amount of data they need to collect by focusing on only a subset of cases or elements rather than all possible cases or elements. It was impossible to conduct a comprehensive survey of the entire population. Purposive sampling was used to select a representative sample that could address the study issues. As a result, a representative sample of 200 tertiary institutions was chosen for the study. This method was used in this study to obtain respondents who are familiar with supply chain management operations in their respective companies. However, to select a representative number of 200 for the study, a convenience sampling technique was applied.

3.4 Types and Sources of Data

Primary data and secondary data sources are used in this research. Robson (2011) defines primary data as information gathered or witnessed directly from first-hand experience. Primary data is information obtained by the researcher in the field. The purpose of using primary data was to see if the difficulties raised in the literature were similar to those found in the research area. Questionnaires were employed as the primary data collection tool in this study. Questionnaires were used to collect a big amount of data from a large number of people in a short period of time and at a relatively low cost.

Robson (2011) defines secondary data as data that has been published and acquired in the past or from other parties; examples include the usage of the internet, books, and other sources. Secondary data refers to information gathered in the past and is usually in the form of published information. Without taking into account previous research on the issue, the study will be unable to be performed successfully. It expands on the work of other authors who have written about materials handling practices. The secondary data for the study came mostly from textbooks, journals, articles, theses, and reports, as well as information from the internet.

3.5 Method of Data Collection

For research purposes, there are a variety of data collection techniques. The methods employed include questionnaires, interviews, and observations, to name a few. Each data gathering technique is better suited to specific data collection equipment. A structured questionnaire was used as the primary data gathering tool in this study. A questionnaire, according to Robson (1993), is a collection of questions submitted for responses that can be examined for usable information. The questionnaire was intended to incorporate both open ended and closed ended questions, and it was based on the study questions and objectives. Respondents were asked to

provide free responses to open-ended questions, whereas closed-ended questions permitted them to select one response from a list of options.

Employees with managerial status were given questionnaires to represent their particular tertiary institution. The questionnaires were created to collect data on the state and impact of materials handling in order to draw conclusions and provide recommendations at the conclusion of the study. All of the questions were filled out by hand.

The constructions employed in the study are listed below, along with the number of subconstructs if any, the number of items used to measure the construct, and the literature sources used to obtain the items.

3.6 Data Analysis

According to Bryman (2016), data analysis involves systematically observing trends in recorded observations and developing opinions that account for those trends. It refers to the process of using statistical tools to make meaning of the data collected. To reach the study's goal, the researcher used a quantitative research approach. To that end, this research identified, sorted, and organized data; investigated data relationships; and coupled analysis with connecting, shaping, and modeling. The questionnaire data were coded and analyzed using computer tools such as Microsoft Excel and the Statistical Package for Social Scientists (SPSS). The data was analyzed in two ways: descriptively and explanatorily. To explore the relationship between the variables, regression analysis was utilized, and the Hayes Macro Process model was used to investigate the regression between the variables. In this study, multiple linear regression models were used to achieve research objectives. The basic objective of using multiple linear regression analyses in this study was to make the research more effective in analyzing impacts of independent variables

(Receiving, storage, order picking, put away, and shipping) on the dependent variable store performance).

Gujarati (1995) defines a regression function as follows:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots.. + \beta_n X_n + \varepsilon_i$

Where; Y is dependent variable (store performance).

X_n is independent variables (receiving, storage, order picking, put away, and shipping)

β_0 is constant. β_{1-n} are the coefficients of the independent variables X_1 to X_n.

ε is an error term

Multiple linear regression model assumptions were conducted based on Gujarati, (1995) and (Fidell, 2001). Checking goodness-of-fit carries significant benefits for the research because once the model is fitted; it is effective in describing the outcome of variables.

3.7 Validity and Reliability of the Study

Validity and reliability are crucial criteria in quantitative research that represent quality and rigor in design, according to Saunders et al. (2016). Within qualitative research, there are similar concerns. Validity refers to the accuracy and honesty of the data and findings generated in quantitative research. It also applies to the concepts being investigated, the people or things being investigated, the data gathering processes, and the results reached (Saunders et al., 2016). There are several levels of validity, each of which contributes to the overall credibility of the study. They also define reliability as the degree to which a measuring device generates consistent and reliable results across time, among similar groups, and independent of who administers it.

A reliable measuring device will always return the same result on different times if the thing being measured hasn't changed in the interim. To ensure validity and reliability, data for the study

was collected from both primary and secondary sources using a specially designed questionnaire. The questionnaire was thoroughly evaluated by the researcher, supervisor, and other specialists in terms of substance and objectives. Later, more attention was made to the data entry technique to ensure that the information was correct. Because data is prone to errors, the data entering method was given extra attention.

3.8 Ethical Considerations

For such a study as this, there was a need to put great emphasis on ethical concerns relating to survey studies at the firm level. As such, the questionnaire survey was not forced on unwilling institutions but listed those who readily agreed to participate. This was confirmed by giving the school's letter of introduction to the willing institutions and respondents in the Western region. The letter was shown or given to the participants who explained the intent of the study to them. They obtained their consent and permission to participate in the study by engaging with them via numerous meetings and were guaranteed total confidentiality regarding their responses and their business. Therefore, the data were handled and used primarily for analysis purposes as part of ethical consideration, since it was made clear to the respondents prior to data collection.

3.9 Profile of Tertiary Institutions

The study focused on selected tertiary institutions in the Western Region of Ghana. These include Takoradi Technical University, Sefwi Wiawso College of Education, among others.

3.9.1 Takoradi Technical University

The Takoradi Technical University was established in September, 2016, as a result of the government's policy to convert Takoradi Polytechnic, among five other Polytechnics, to the status of Technical University. In effect, since April 1954, Takoradi Technical University

(formerly Takoradi Polytechnic) has existed as a Government Technical Institute under the Ghana Education Service of the Ministry of Education. During that period, the institute offered programmes mainly at the Craft and Technician Certificate levels in commercial and technical subjects, awarding Royal Society of Arts (RSA) and City and Guilds of London, United Kingdom. However, in 1990, the Ghana Education Service took over the awards of the abovementioned certificates.

As part of the Ghana Educational Reforms which began in the 1980s, the Takoradi Technical Institute and five other similar institutions were upgraded by the Polytechnic Act 321 (PNDC Law 1993) to become part of the Ghana Tertiary Education System. The Polytechnics, per the law, began to offer Higher National Diploma (HND) programmers in the 1993/1994 academic year. These reforms mandated the polytechnics to compliment the role of the Universities to increase access to tertiary education for the training of middle and higher-level manpower. A Bill proposed by the Ministry of Education and considered by Cabinet of Government in 2014 was passed by Parliament as an Act in August 2016 with the assent of the President, converting some polytechnics into technical universities as full-fledged technical universities.

In view of that, the Takoradi Polytechnic Council adopted the name "Takoradi Technical University" which has been duly registered with the Registrar General's Department of Ghana. Currently, Takoradi Technical University has three (3) campuses: Effia Kuma (Takoradi), Butumagyebu (Sekondi) and Akatakyi (Agona-Nkwanta). The Akatakyi Campus is the largest of the three, with an acreage of 152.3.

Mandate

The Takoradi Technical University, without limiting its other powers, shall;

1. Award degrees, diplomas, certificates and other qualifications as may be agreed upon by the Council of the Takoradi Technical University as established under section 4 of the Technical Universities Act, and approved by the national body responsible for accreditation.
2. Offer Higher National Diploma programmes approved, accredited, examined and certified by the national bodies responsible for Higher National Diploma programmes and awards.
3. Provide for the general welfare, recreational and social needs of staff and students of the Takoradi Technical University.
4. Exercise powers that are incidental to the achievement of the aims of the Takoradi Technical University.
5. Increase access to career focused tertiary education in general, while encouraging female enrolment in applied science and technology programmes.
6. Develop appropriate attitudes and required skills in Information Technology (IT) and entrepreneurship to equip the students with such basic skills for industry.
7. Promote industrialization through relevant research, consultancy and linkage programmes, for social and economic development in the region and the country as a whole.
8.

CHAPTER FOUR

PRESENTATION OF DATA, ANALYSIS AND DISCUSSIONS

4.1 Introduction

This chapter covers the data acquired in the field in order to assess the study's important variables and determine the relationships between them in order to satisfy the study's objectives. In the following sections, the findings were presented in accordance with the study's objectives: demographics, descriptive statistics, inferential statistics, model test analysis, and discussion of findings. Tables and figures generated from Microsoft Excel spreadsheets and statistical product and service solutions (SPSS) version 25 outputs were used to present the findings.

4.2 Response Rate

A total of 101 responses were received from the online survey, out of the sample size of 200. This equates to a response rate of 50.5 percent. Because it exceeds half of the sample size, the response rate can be described as relatively good. The low response rate can be ascribed to the difficulty in accessing top-level executives in in the tertiary institutions in the Western region to complete the online survey.

4.3 Profile of Respondent and Institutions

Table 4.1 shows the demographic information of respondents in order to determine their suitability to represent their varied institutions and assure the study's face validity.

Table 4.1: Profile of Respondents

Variable	Category	N	%
Gender of Respondent	Male	73	72.3%*
	Female	28	27.7%
Age of Respondent	Below 20 years	27	26.7%
	20-30years	46	45.5%*

	31-40 years	27	26.7%
	41-50 years	2	1.98%
Highest Educational Qualification of Respondent	JHS/SHS	1	1.0%
	Undergraduate	54	53.5%*
	Masters	39	38.6%
	PhD	3	3.0%
	Some professional/ vocational courses	5	5.0%
Respondent's Years of Working Experience	<1 year	13	12.9%
	1-5 years	43	42.6%*
	6-10 years	21	20.8%
	More than 10 years	24	23.8%

Table 4.1 shows that there were more male participants than females with 72.3% and 27.7% for males and females respectively. The demographic information also showed that the modal age of the respondents was between 20 and 30 years old, with 45.5 percent of responses (n=46) falling in this range. Those under the age of 20 and those between the ages of 31 and 40 received 26 percent and 26.7 percent of responses, respectively (n=27). Only two responses (1.98%) were over the age of 40. This indicates that the store officers and manager of tertiary institutions in the Western region of Ghana are extremely young and enthusiastic.

In terms of educational qualifications, the bulk of the respondents (53.5 percent, n=54) had undergraduate degrees, followed by 38.6 percent who had Masters degrees, and a minority (3 percent and 5 percent) who had PhDs or certificates from professional/vocational courses. To ensure face validity, the respondents must be knowledgeable and understand the questions asked to them in the questionnaire. Finally, in terms of number of years of working experience of respondents, it could be seen that about 42.6% have about 1-5 years' experience, whereas 20.8% and 23.8% had about 6 – 10 years and over 10 years' experience in their respective institutions

in Ghana. Just 12.9% (n=13) of the respondents had less than a year's experience. This indicates a high knowledge base and understanding of the subject matter of the study and the industry in question to provide adequate responses to questions posed.

4.4 Descriptive Statistics of Key Variables of the Study

It was necessary to compute descriptive statistics for all of the study's variables. The variables include materials handling practices which was the independent variable and store performance which was the dependent variable. In this section, descriptive statistics for these variables are presented and analyzed after reliability and validity tests have been conducted.

4.4.1 Extent of Materials Handling Practices

The independent variable of the study was materials handling practices. It was measured in five practices with scales adopted from extent studies. The practices included receiving, storage, put away, order picking, and shipping/dispatch. A 5-point Agreement Likert scale to measure each construct. Tables 4.2 to Table 4.4 show the descriptive statistics of the measures for materials handling practices.

Table 4.2: Materials handling practices Measures_ Receiving and Put-Away Activities

Item Code	Description	Mean	Std. Dev
Receiving activities			
RECV1	My institution has a standard operating procedures (SOP) in place that provide instructions to receive items properly	3.43	1.424
RECV2	We have notice of the goods arrival in advance which allows the store to prepare	3.47	1.480
RECV3	My institution has sufficient equipment to unload materials.	3.39	1.449
RECV4	My institution has sufficient space for loading/unloading materials	3.38 3.65	1.392
RECV5	At the time of receiving, occurrence of physical accidents on received goods are minimum	3.43	1.315
RECV6	At the time of items arrival appropriate documents are brought together	3.62	1.287
RECV7	The shelves for each received materials in the store are adequate to store and put away	2.94	1.199

RECV8	All members of the receiving team are well trained in the receiving procedures.	3.40	1.123
RECV9	There is a pre-notification of the incoming goods that will be received in the stores	3.29	1.052
RECV10	During the time of receiving goods, there are procedures for the cross checking of the documents with the goods	3.81	1.155
Put-away activities			
PUT1	Store personnel of my institution are skilled to perform put away activities.	3.18	1.236
PUT2	In my institution's store there is sufficient equipment's to do the put-away activity.	3.41	1.142
PUT3	When product is placed on its location, the storage location of the product is properly recorded	3.10	1.269
PUT4	My institution's store design/layout is convenient to perform put-away activities.	3.48	1.110
PUT5	The design of the store is easy to access items, convenient to load and unload	3.22	1.262
PUT6	There is an established well-structured put-away process for all items received into my institution's stores	2.90	1.237
PUT7	In my institution store put away activity performed manually via labour force	3.07	1.387

Source: Field Work, 2023

From Table 4.2, it shows that the activity regarding to receiving in the organization are adequately performed in relating to the receiving store of the organization like cross checking of the documents with incoming goods, there is pre-notification of incoming goods to prepare the store, minimizing the physical accidents on received goods, and following the standard operating procedures/guidelines which helps to receive goods in to store, but in the organization the shelves are inadequate for each received materials in the receiving store of the organization to store the items in a suitable ways. Of course, the organization in relation to receiving of store is good, still now there are insufficient shelves in the store of the organization to receive the goods. Overall mean for receiving is 3.47 suggesting that the respondents agree that the organization is efficient in all parameters of receiving of store of the organization except shelves, and standard deviation of 1.28 suggests that there is variation in agreement from common mean.

As can be seen above, receiving activity is agreed with the grand mean of (3.47) and this indicates the current receiving activity of the organization which includes the typical materials handling activities like unloading, item identification, recording the goods receipt, quantity and quality inspection, un-packing, and sorting activities is good (Bodnar, 2013). The receiving procedure can begin as soon as the goods are delivered. This allows the store to prepare, synchronize inbound operations with arrival, and begin unloading. Units are then packed away with precise documentation before being shipped out (Habazin, 2017).

Similarly, regarding put-away activities, Table 4.2 further shows that there are adequate activities concerning the put away store of the organization; like adequate equipment to do put away, the design/layout which is convenient to perform put away of store, and the design of store is easy to access items, and convenient to load and unload the items in the organization based on the above grand mean of (3.19). But, in the organization there are inadequate well established put away process/guidelines for all received items to put away in store of the organization based on the above table mean of (2.90) and the standard deviation of 1.23 suggests that there is variation in agreement from common mean. So, in the organization put away activity of the store is adequate, but it is insufficient.

So, the result shows regarding to put-way activity of store is agreed with the grand mean of (3.19) and this indicates the contemporary put-way activity of the tertiary institutions which comprises the process that moves material from the receiving area to the storage, replenishment, or pick areas is importance (Faber, 2015).

Table 4.3: Materials Handling_Storage Activities

Item Code	Description	Mean	Std. Dev
Storage activities			
STOR1	Our store team are effective in minimizing total goods damage that are stored in the store	2.44	1.228

STOR2	In my institution's store are appropriately using available storage areas for storing goods	2.50	1.301
STOR3	The space between the stored items in the store is not sufficient to move the workers and machinery.	2.61	1.208
STOR4	In the store storage areas are available based on the nature of the items.	2.56	1.499
STOR5	In the store there is tight control of accessing the storage area In	2.45	1.292
STOR6	the store there are material protection equipment to minimize the extent of materials damage.	2.65	1.330
STOR7	There is no updating of records when putting the goods away in their storage areas	2.40	1.457
STOR8	Shelves/racks/pallets are arranged in lines with the adequate passageways to facilitate put away and order picking activities.	2.94	1.455
STOR9	There is regular inspection and cleaning of storage areas.	3.03 2.69	1.431
STOR10	In our store the materials can be stored in codification	2.44	1.447

Source: Field Work, 2023

As indicated on the above table 4.3 the extent storage activity of warehousing management the case of the organization is poor. Accordingly, the grand means storage of warehousing management is 2.63 which is low performance with respect to the overall measures taken into consideration like the activities implemented linking to the storage of store of the organization, updating records of goods in store, the tight control around the storage of store, in storage the materials are not classified based on their nature like perishable goods, frequent etc., the organization is inappropriately using available storage areas for storing goods, the shelves/racks/pallets are not arranged in lines to facilitate put away and picking activity in storage store of the organization, and the materials stored in storage are not stored in a codification. But in the storage store of the organization there is adequate regular inspection and cleaning of storage area; and the standard deviation of 1.36 suggests that there is considerable variation in agreement from common mean. So, the grand mean of storage store of the organization is still inadequate to store the received materials in appropriate ways.

The aggregated value of storage activity has scored the grand mean value of (2.63) this shows that the current storage activity store of the organization disagree with designates the handling of goods and material and the storage methods not depends on the size and quantity of the items in inventory and the handling characteristics of the product or its container (Frazelle, 2002).

Table 4.5: Materials handling_ Order Picking and Dispatching Activities

Item Code	Description	Mean	Std. Dev
Order Picking activities			
PICK1	Store personnel are skillful in performing order picking process.	3.28	1.668
PICK2	In my institution's store design/layout is convenient for an easy order picking process.	3.00	1.470
PICK3	Items returned from end user due to error in order-picking are high.	3.09	3.244
PICK4	My institution has adequate shelves for the goods in the store to facilitate order picking process.	3.12	1.451
PICK5	In my institution, order-picking is performed through gathering the item correctly by requested order.	3.00	1.217
PICK6	Processing time to do the order-picking in our store is reasonable.	3.32	1.208
PICK7	The design of the store system is properly done to improve customer service in order picking process	2.73	.989
PICK8	My institution's store performs order picking manually	2.82 Items	1.438
PICK9	are picked from the storage area as exactly mentioned on picking slip/issue order	2.93 the	1.243
Dispatching activities			

		3.26	1.016
DISP1	The staffs of the store do not have known how the motions of them have impact on waiting and un-satisfaction of customers.		
DISP2	My institution's stores perform perfect order delivery lead time to the organization customers.	3.19	1.247
DISP3	In our store there is high commitment to protect the items safety.	3.70	1.015
DISP4	In our store there is high commitment to make easy of shipping and transportation process.	2.96	1.303
DISP5	Goods are delivered to buyer according to the specification, at the right without any damage.	3.27	1.038
DISP6	Communication is successful in making ready the transportation and to inform the recipient	3.65	1.053
DISP7	The customer orders are packed into the manner to prevent damage during transit.	3.73	1.104

Source: Field Work, 2023

From Table 4.4, it can be seen that all the measures from the order picking and dispatching activities had mean values exceeding 3.0, implying agreement. This implies that processing time to do the order-picking in store, the shelves in order picking of store of the organization to facilitate order picking process, the order picking is gathering the items correctly by the requested order, but the order picking store of the organization is insufficient in terms of items are picked from the storage is not based on the picking slip/issue order, and the design of store system is not properly done to improve customer service in order picking process store of the organization; and standard deviation of 1.55 suggests that there is considerable variation in agreement from common mean.

Generally, above table 4.6 shows that the organization order picking activity is agreed with the grand mean of (3.03) and this indicates the recent order picking activity of the organization involves the processes of clustering and scheduling the customer orders, assigning stock on locations to order lines, releasing orders to the floor, picking the items from storage locations

and the disposal of the picked items and it involves selecting and gathering specified amount of right in accordance with the order and it is composed of lifting, moving, picking, putting, packing, and other related activities. So, this variable supported as per the interpretation set by (Shiau and Lee, 2010).

Similarly, as it is illustrated on the above Table 4.4, the grand mean value of (M=3.39) the above table is adequate shipping/dispatching of warehousing management of the organization. Like the customer orders are packed into the manner to prevent damage during transit in the organization, commitment to protect the items safety, communication that making ready the transportation and to inform the recipient, and shipping of the goods are delivered to buyer according to the specification, at the right without any damage.

But, in the shipping/dispatching warehouse of the organization there is inadequate commitment to make easy of shipping and transportation process for the customers; and standard deviation of 1.11 suggests that there is great variation in agreement from common mean. Still in the organizations shipping of warehouse is adequate, but it is not totally sufficient.

Generally, as can be observed, the shipping activity is agreed with the grand mean of (3.39) and this indicates the existing shipping activity of the organization which indicates the preparation of usable commodities for shipment to customers and the placement of those commodities on vehicles for transport to the customers and processing information and for dispatching personnel to fulfil various tasks like checking packing, labelling or loading items is crucial. So, this analysis related with the interpretation by Shiau and Lee (2010).

4.4.3 Extent of Store performance

The dependent variable of the study was store performance. It was measured in four indicators with scales adopted from the extant studies including Quality, Response time, Cost/financial and Productivity. A 5-point Significant Likert scale to measure each supplier selection. Table

4.5 shows the descriptive statistics of the measures for store performance.

Table 4.5 Measures of Store performance

Item Code	Description	Mean	Std. Dev
Quality			
QUAL1	In our store there is no inventory discrepancies	2.79	1.283
QUAL2	Our store give a priority for a safety of items	3.20	1.357
QUAL3	Accidents are not occurred in our store	2.81	1.347
QUAL4	Our store put away accurately materials in a correct location	3.60	1.184
QUAL5	My institution's store picks accurately materials from the storage based on the requested	3.88	1.267

Source: Field Work, 2023

From Table 4.5, it can be seen that quality performance of store adequately materials are picked from the storage based on the requested order, put away materials in a correct location, and give a priority for a safety of items in quality performance of store of the organization. But accidents are not highly occurred in quality store performance of the organization, and there is a low inventory discrepancy in the store quality performance of the organization; and the standard deviation of 1.29 suggests that there is substantial variation in agreement from common mean. So, the quality of store performance of the organization is adequate but, it is not sufficient.

4.5 Inferential Statistics

It was necessary to determine how reliable the items used to measure each construct was. As such, reliability test was conducted.

4.5.1 Reliability

For the Test of Reliability, the Cronbach's Alpha value for each variable was computed using the SPSS software and the results for each variable can be seen in Table 4.6:

Table 4.6: Test of Reliability

Construct	Number of Items	Cronbach's α
Materials Handling practices		
Receiving activities	10	0.874
Put-away activities	7	0.899
Storage activities	10	0.877
Order picking activities	9	0.855
Dispatching activities	7	0.890
Store performance	5	0.932

Source: Field Work, 2023

From Table 4.7, the Cronbach's Alpha values ranged from 0.855 to 0.953 implying that all constructs and sub-constructs passed the minimum threshold of 0.70 for reliability.

4.6 Correlation among Constructs

The correlation results shown in Table 4.8 below generally revealed that respondents from the selected tertiary institutions in Western region of Ghana Ghana partly attribute their store performance to their materials handling practices (Receiving activities, Put-away activities, Storage activities) and store performance factors as there were positive and significant correlations among those constructs and store performance. However, correlation between the control variables and store performance were negative and insignificant. All other associations among the variables were also positive. This can be seen in Table 4.7

Table 4.7: Correlation among Variables

Variables	**1**	**2**	**3**	**4**	**5**	**6**
1. Receiving activities	1					
2. Put-away activities	.811**	1				
3. Storage activities	.723**	.813**	1			
4. Order picking activities	.912**	.947**	.915**	1		
5. Dispatching activities	.710**	.676**	.746**	.769**	1	
6. Store performance	.611**	.655**	.624**	.681**	.727**	1
Mean	**5.51**	**5.56**	**5.49**	**5.52**	**5.42**	**5.15**
Standard Deviation	**1.09**	**1.13**	**1.12**	**1.03**	**1.08**	**0.92**

*p<0.05; **p<0.01

Source: Field Work, 2023

4.7 Regression Analysis

In establishing the effect of materials handling practices on store performance, correlation and ordinary least square (OLS) regression was employed.

There were independent variables considered were the practices of materials handling practices, while there was a dependent variable which was store performance.

Table 4.8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.652[a]	.425	.394	9.16803

a. Predictors: (Constant), Storage, Order picking, Shipping, Put away, Receiving
b. Dependent Variable: Store performance **Source: Field Work, 2023**

The study model summary is presented in above table 4.8. This summary is used to identify materials handling practices in explaining store performance. As it is shown in the table, R square is 0.425 and adjusted R square is 0.394 that 39.4% variation in dependent variable is explained by independent variables used in the model. This implies that 39.4% variation in store performance of tertiary institutions in the Western region of Ghana is affected by warehousing management.

Table 4.9 ANOVA Results

Model	Sum of Squares	Df	Mean Square	F.	Sig.
Regression	5890.784	5	1178.157	14.017	.000[b]
Residual	7985.018	95	84.053		
Total	13875.802	100			

a. Predictors: (Constant), Storage, Order picking, Shipping, Put away, Receiving
b. Dependent Variable: Store performance **Source: Field Work, 2023**

The ANOVA is presented in above Table 4.9. This analysis is used to identify the effect of materials handling practices on store performance which is general objective of the study. In addition, this analysis is used to identify appropriateness of the model in estimating the effect of materials handling practices on store performance. F-statistic value of the model is 14.017 and it

is significant at 0.000 indicating that the model used is appropriate to explain effect of materials handling practices on store performance. This implies that materials handling practices significantly affects store performance of tertiary institutions in the Western region of Ghana.

Table 4.10 Regression Results

Variables:	**Standard Estimates**
	Store Performance
Hypothesized	**Model 1**
Direct Effect	
Receiving activities	.441(3.197)*
Put-away activities	.379(2.019)*
Storage activities	.269(2.139)*
Order picking activities	-.300(-2.344)*
Dispatching activities	.831(2.817)*
FIT INDICES	
F-Statistics	14.017
R^2	**.425**

*p<0.05; **p<0.01

Source: Field Work, 2023

4.8 Discussion of Findings

The study sought to examine the effect of materials handling practices on store performance of tertiary institutions in Ghana. The effect of individual dimension of materials handling practices is presented in table 4.10 above. The researcher used unstandardized coefficients and their sign to analyze the effect on store performance.

Coefficient of receiving is positive and significant at 0.01. The positive coefficient suggests that improving warehousing management's receiving increases the organization's store performance

while other variables remain constant. This implies that receiving of store have significant positive effect on store performance of the organization. This result is supported by Frazelle (2002) that receiving serves as the foundation for all subsequent warehousing operations. It will be very difficult to handle merchandise properly in put away, storage, picking, or shipping and receiving is the collection of activities involved in the orderly receipt of all materials coming into the store, ensuring that the quantity and quality of such materials are as ordered, and disbursing materials to storage or to other organizations.

Coefficient of put-away is positive and significant at 0.01 indicating that shipping has a positive effect on store performance. Positive sign of the coefficient of the put-away indicates that increasing put-away activities at the sotes increases store performance and vice versa holding other things constant. This result is in agreement with Shiau and Lee (2010).

Dispatching is a process involves inspecting, packing, palletizing and loading items into a carrier for further delivery. Coefficient of put away is positive and significant at 0.05. Positive sign of the coefficient suggests that when put away increases store performance of the organization increases and vice versa holding other variables remain constant. This implies that put away is positively affecting store performance of the organization. This result is agreement with Bartholdi and Kackman (2011). Following that, this information will be used to create efficient pick lists that will aid order-pickers in retrieving the goods for customers. Because the goods may need to be transported a long distance to its storage site, put-away might be timeconsuming.

Coefficient of storage is positive and significant at 0.05. Positive sign of the coefficient suggests that when storage increases store performance of the organization increases and vice versa holding other things constant. This implies that storage is positively affecting store performance

of the organization. This outcome supported by Frazelle (2002) the storage method depends on the size and quantity of the items in inventory and the handling

characteristics of the product or its container.

Table 4.11 below is a summary of the hypotheses tested:

Table 4.11: Summary of Results of Hypotheses Testing

	Sub	Path	β	T-Value	Remarks
H1	Store	handling practices Performance	.441	3.197	Supported
	H1a	Receiving → store performance	.379	2.019	Supported
	H1b	Put away → store performance	.269	2.139	Supported
	H1c	Storage → store performance	-.300	-2.344	Not Supported
	H1d	Order Picking → store performance	.831	2.817	Supported
	H1e	Dispatching → store performance			

Source: Field Work, 2023

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND DISCUSSIONS

5.1 Introduction

This chapter serves as the thesis' final chapter. It summarizes the previous chapter's findings, draws conclusions, and makes recommendations for both theory and practice. One hundred and four (101) responses were collected from respondents from the selected tertiary institutions in the Western region of Ghana through an online survey using purposive and convenience sampling techniques. Despite having a sample size of 200 institutions, the survey received a

50.5 percent response rate. The summary of the study's findings is the subject of the next subsection.

5.2 Summary of Findings

This section summarizes the study's findings in relation to the research objectives which were to examine the effect of materials handling practices on store performance.

5.2.1 Relationship between Materials Handling Practices and Store performance

The main objective of the study was to examine the effect of materials handling practices on store performance. The findings revealed that materials handling practices had a positive and significant effect on store performance. Based on different literatures and implementations in the organization, to measure materials handling practices; receiving, storage, put away, order picking, and shipping/dispatching are used as a dimensions of materials handling practices. Data regarding to materials handling practices and its effect on store performance were gathered through a questionnaire. The independent variables of the study have a significant effect on dependent variables. In the organization there is low shelves, pallets and racks to store the received material, lack of updating the record of materials in the storage is one of the cause for the deterioration, and theft of materials in the organization, there is no well-structured put-away process for items received, and the organizations are not appropriately using available storage areas for storing goods, and there is lack of recording the items in their location.

On the other hand, in the organization there is lack of suitably of inspection and cleaning of storage timely, and the materials stored in storage are not stored in a codification, picking the item is not based on the order of the customer, especially in the order picking activity. The design of store system is not properly done to improve customer service in order picking process, in the organization there is lack of distributing the materials to the end users based on their order

specification and perform perfect order delivery time to the customers of the organization, there is inventory discrepancies in the store of the organization, there is poor safety of items, accidents are highly occurred in store, and the organizations are put away materials in a correct location, and in the organization there is no hard work to minimize the total inventory and warehousing cost.

5.3 Conclusions

Based on the findings of this study, the effect of materials handling practices on Store Performance, the researcher draws the following conclusions. Relying on the results of the study and the summary of findings, the roles of store are to provide storage facility, maintain regular supply, create time utility, minimizes risk, facilitates movement of goods, and generates employment. The study reveals that the prime reason for the establishment of store management in the organization is to store the materials in a safe, quality and to provide service to the customers, and the study concludes that there is a significant relationship between materials handling practices and store performance.

However, it is difficult to generalize that the materials handling practices of the organization under the study was providing services to the customer efficiently and effectively. Of course, some of reasons for poor materials handling practices in the organizations to provide adequate service are; lack of skilled man power, existence of poor shelves, pallets, and racks, lack of minimizing the cost of warehousing activity, lack of following the customer order, lack of giving priority for the safety of item, low level of giving attention to the accident occurred in store, poor information sharing, and lack of appropriately cleaning the storage areas. Finally, as per the multiple regression analyses, the main variables that could affect store performance include; receiving, storage, put away, order picking and shipping of materials handling practices.

Hence, organizations are expected to enhance their materials handling practices so as to gain better store performance in terms of quality, response time, cost/financial, and productivity.

5.4 Recommendations

In light of the study's findings and objectives, the researcher proposes some recommendations. Based on the findings of this research, the researcher gave the following recommendation that helps the tertiary educational institutions to improve their store performance. Since materials handling practices has significant effect on store performance of the tertiary educational institutions, hence, it is advisable for the management to enhance the efficiency of warehousing through, maximize and optimize all available space, lean inventory (possibly reduce or eliminate safety stocks, and try to get suppliers to deliver smaller quantities more frequently), adopt enabling technology (i.e a store management system (WMS) or an ERP system with a strong WMS module can improve efficiency by suggesting the best routes and methods for picking or put-away), organize workstations i.e organizing workstations improves productivity of store because workers do not have to search for tools or equipment, use the "5S" method of Sort; Set in order; Shine; Standardize; and Sustain which is designed to keep clutter at bay, reduce errors, and improve safety, and optimize labor efficiency.

Dispatching has significant effect on store performance, hence, the management of the organization shall use the following to enhance the shipping store of the organization through having an inventory control procedures in place to receive, store and ship goods which help to manage and run an efficient store, have an efficient pick, pack and ship process to reduce an error and to accelerate shipping and delivery, use the right equipment (pallets and forklifts to move goods through), optimize the receipt of goods, and design an optimized store layout to reduce the cost of store, and giving high commitment to make easy of shipping and transportation process.

Based on the findings, receiving strongly affects the store performance of the organization. Hence, the management of the organization is advisable to improve its receiving through compile the correct metrics for time it takes to move materials through the system to usability, error reports, pre-receiving i.e. before the receiving process begins need to establish and enforce receiving requirements for suppliers and shippers, shipment identification, count the product received to make sure the correct amount of the shipment has been sent to store, check all products being received for possible damage caused during shipping, receiving documentation, and adding more shelves in store to store materials in a free ways.

Since storage is significantly affecting store performance of the organization, hence, store management of the organization shall further improve the storage through evaluate whether racks up vertically, consider installing a mezzanine above a floor-level process, reduce aisle width in the racking area, appropriately using available storage areas for storing goods, the team collaboratively work to minimizing the damage of goods in storage of store, separating the storage based on the nature of item, codifying each material in storage either in terms of alphabetical or numerical, and adding material protection equipment to minimize the extent of materials damage in storage like refrigerator, ventilator etc.

Since a put away has a positive and significant effect on store performance of the organization, so, the organization specially the store manager better to improve the efficiency of put away in store through; collect the correct data and analysis (i.e before put away process begins collect the correct data in order to make this go as smoothly as possible), be put away as quickly as possible make sure items are placed correctly the first time, minimize damaged items in put away process, track all item locations correctly, count items before they are put away, use direct put away when possible, and keep store clean and organized.

Finally, giving a training for the staff of each respective activity, codifying each materials in the storage, update recording the materials in the storage, adding more pallet, racks, and shelves for materials in the store, sharing the information with the end user/customer, check each and everything in store either during receiving or shipping the item, keep the customer order appropriately, as much as possible add another store to store the materials in a free ways, to eliminate the waste of items, and to keep the safety of items in store, installing security camera to reduce the theft of materials in store through cheating, deliver the materials to the customer according to their specification, and giving priority to the safety of item in store, and the receiving of items should be performed according to the standard operating procedure for receiving of standard which is compiled for use by the store.

5.5 Suggestions for Further Research

Given the study's findings and limitations, future studies should consider extending the study's scope to include other industries, such as manufacturing, etc., in order to establish the impact of materials handling practices on store performance since this study was limited to tertiary institutions. Additionally, future studies may employ mixed method research design so that richer insights can be gained from the participants to supplement the information gained through the statistical methods.

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Appendix I

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

QUESTIONNAIRE

My name is John Baidoo. I am a Student at Kwame Nkrumah University of Science and Technology School of Business, Department of Supply Chain, and Information Systems. This survey instrument has been designed to enable me carry out research required for my Master's degree. Any information provided will *ONLY* be used for general information, and it will be treated as ***HIGHLY CONFIDENTIAL*****.**

SECTION A: MATERIALS HANDLING PRACTICES

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following statements about your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree

Receiving Activities	1	2	3	4	5	6	7
1. We are capable of dealing with the risks that affects our operations							
2. Considerable costs are saved due to supply chain reengineering in my organization							
3. Supply chain reengineering has helped my organization to gain competitive edge							
4. Supply chain reengineering decisions follow clear procedures							
5. Supply chain reengineering has resulted into improved expertise in my organization							
Put-Away activities	**1**	**2**	**3**	**4**	**5**	**6**	**7**
1. My organization is able to react to dynamisms in the operations of the firm							
2. Our procurement staff effectively anticipate the future risks in the organization							
3. We have a robust system that accurately tracks the levels of the inventory in the organization							
4. Through agility the organization was able to attain an optimal level of operations							
5. The adoption of the agility practices has enabled a continuous production flow							

Storage activities	1	2	3	4	5	6	7
1. Risk management culture result into products that are in line with the needs and wants of our customers							
2. Risk management culture has greatly improved the identification and reduction of risks in the organization							
3. Risk management culture aims at reduction of all risky activities in the production systems and processes of our organization							
4. Risk management culture in my organization has led to continuous improvement initiatives							

SECTION C: STORE PERFORMANCE

Using the 7-point Likert scale below, please indicate your level of agreement or disagreement with respect to the following statements about your organization.

1 Strongly disagree	2 Disagree	3 Somewhat disagree	4 Neutral	5 Somewhat agree	6 Agree	7 Strongly agree

Quality Performance	1	2	3	4	5	6	7
1. In our store there is no inventory discrepancies							
2. Our store give a priority for a safety of items							
3. Accidents are not occurred in our store							
4. Our store put away accurately materials in a correct location							
5. My institution's store picks accurately materials from the storage based on the requested							

SECTION D: DEMOGRAPHIC INFORMATION

INSTRUCTIONS: Please kindly write in ink in the box which corresponds to the statement, which in your opinion is the most appropriate answer to the related question. For the following questions, kindly select by checking **(√)** all that apply. **Gender:** [ ] Male [ ] Female

Age: [ ] Below 20 years [ ]20-30years [ ]30-40 years [ ]40-50years [ ]Above 50years

What is your highest of education? JHS [ ] SHS[ ] Undergraduate[ ] Masters[ ] PHD [ ]

Some professional/ vocational courses [ ]

Years of Experience: Less than 1 year [ ] 1 – 5 years 5 – 10 years [ ] More than 10 years [ ]

Thank you for partaking in this study