# THE EFFECT OF MATERIAL MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE:

# THE CASE OF POLYTECHNIC COLLEGES IN GURAGE ZONE

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## List of Abbreviation and Acronyms

| | | |
|---|---|---|
| **ANOVA** | - | Analysis of variance |
| **EMoE** | - | Ethiopian Ministry of Education |
| **EMoFED** | - | Ethiopian Ministry of Finance and Economic Development |
| **GZPC** | - | Gurage Zone Polytechnic College |
| **GZPCO** | - | Gurage Zone Polytechnic College Office |
| **HRD** | - | Human resource department |
| **SNNPR** | - | Southern Nations and National Peoples Reign |
| **SPSS** | - | Statistical Package for Social Science |
| **TVET** | - | Technical and Vocational Education and Training |

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## *Abstract*

*The purpose of this study was to determane effect of material management practices on organizational performance in polytechnic colleges of Gurage Zone. The population of the study was was all workers who were working in Gurage Zone polytechnic colleges. Stratified random sampling was used based on the different size of the sample frame in which 216 employees were participated on the study. The researcher used descriptive and explanatory research design and the required data were collected using questionnaire. The reliability was estimated using Cronbach's Alpha Coefficient and the results were between 0.60-0.70 which show acceptable level values. Quantitative data were analyzed using Pearson correlation and multiple linear regression analysis to measure effect of material management practices on organizational performance. The result showed that the effect of all the three material management dimensions of inventory, procurement and warehouse under study showed positive and significant effect on organizational performance. Based on the findings, the study recommended public organizations should strive to strengthen their procurement plan and make a good culture so as to ensure successful implementation of their organizational plan and to achieve their organizational goals and objectives. The study advocated that a lot of emphasis need to be directed to warehouse management and performance measurement based on key performance indicators and the enterprise should maintain the effort made on response time in enhancing performance of their warehouse, and inventory management system of the organization should apply the appropriate inventory management techniques to cope-up problems related with poor inventory handling and costs that arise.*



**Keywords: Inventory, Materials Management, Organizational Performance, Procurement, Warehouse.**

# CHAPTER ONE
# INTRODUCTION

## 1.1. Background of the study

According to National Teachers Institute (NTI, 2006), the administration of a school institution has the responsibility for bringing together various resources and allocating them effectively to accomplish the general goals of the institution. Governments have been investing a substantive resource in setting up educational institutions for this purpose (Noun, 2010). Accordingly, TVET programs provide participants with skills, knowledge and attitudes that enable them to engage in productive work, adapt to rapidly changing labor markets and economies, and participate as responsible citizens in their society (Adams et al., 1992). According to Afeti (2006), skill development is vital to increase productivity, stimulate competitiveness, and bring about economic development. TVET contributes to skill development by enhancing the individual's knowledge of science and technology in a broad occupational area that requires technical and professional competencies that include problem solving, initiative, teamwork and specific occupational skills (UNESCO, 2002).

Materials are the lifeblood and heart of any organization and no organization can operate without them. They must be made available at the right price, at the right quantity, in the right quality in the right place and at the right time in order to co-ordinate and schedule the organizational activity in integrative way (Banjoko, 2000). According to Mbamba (1992), educational materials are any object or unit area that designed and organized deliberately to support and used teaching and learning processes. He further listed educational materials such as laboratories, workshops, libraries and recreational spaces that serve to house instructional activities, furniture, learning and teaching materials which act as source or channel from which learners draw knowledge and acquire skill.

According to (Ayegba, 2013), Material management is the process that coordinates planning, assessing the requirement, sourcing, storing and controlling of materials, purchasing, transporting, minimizing the wastage and optimizing the profitability by reducing the cost of the material. Similarly, Eduardo (2002) viewed materials

management as the system for planning and controlling all of the efforts necessary to ensure that the correct quality and quantity of materials are properly specified in a timely manner, are obtained at a reasonable cost and most importantly are available at the point of use when required. Materials management can be defined as a process that coordinates planning, assessing the requirement, sourcing, purchasing, transporting, storing and controlling of materials, minimizing the wastage and optimizing the profitability by reducing cost of material (Baldva,1997). Materials management is concerned with the planning, identification, procuring, storage, receiving and distribution of material (Pataskar, 2013).

According to Neely (2007), performance is achieving the goals that were given to you in the convergence of organizational orientations. Performance is seen as a state of organizational competitiveness, reached by a level of effectiveness and efficiency (Niculescu and Lavalette 1999). Likewise, Wholey (1996) considered performance as subjective and interpretative, not least, being related to the cost lines, which emphasizes the ambiguous nature of the concept. Similarly, Rolstadas (1998) believed that the performance of an organizational system is a complex relationship involving seven performance criteria that must be followed: effectiveness, efficiency, quality, productivity, quality of work, innovation and profitability.

Past studies have proven that effective materials management could potentially increase productivity by 8%, reduce crew idle time, save about 1.8% of materials cost and eventually reduce the cost of labour by 6%. Similarly, Green et al. (2008) conduct the study on the impact of logistics practice and organizational performance. The study revealed that logistics practices have a positive impact on business performance. Moreover James (2012) carried out an empirical study on material management effect firm performance and found that materials management is positively related to firm performance.

Oyebamiji, (2018) study on materials management and its effect on the performance of manufacturing sector in Nigerian cement industry and the study revealed that materials inventory, materials procurement and inter-departmental collaboration have an insignificant effect on firm performance, while only materials storage has a

significant impact on firm performance. Likewise, Gudeta (2021) carried out an empirical study on effect of logistics management on organizational performance and revealed that transportation, inventory, and warehouse management had positive and statistically significant effect on organizational performance.

Procurement or purchasing is the process of acquisition by means of contractual arrangements after the public competition of goods and services, works and other supplies by the public entity (Getahun, 2015). The term procurement encompasses a wide range of activities that includes purchasing of equipment, materials, labor and services required for construction and implementation of a project (Barrie and Paulson, 2002). While warehouse is a point or place in logistic system in which an organizations stock, holds stocks of raw materials, semi-finished items, finished items for various periods of time (Ogbo & Ukpere 2014).

Inventory is the stockpile of the products an organization is offering for sale or service and the various components that make up these products (Panigrahi, 2013). Inventory management refers to all the activities involved in developing and managing the inventory levels, whether the inventory is raw materials, semi-finished material or finished goods, so the adequate supplies must be always available and the form must make sure the cost of over or under stocks are always low (Kotler, 2002). Prudent management of inventory reduces depreciation, pilferage, and wastages while ensuring availability of the materials as at when required (Ogbadu, 2009). High levels of inventory held in stock affect adversely the procurement performance out of the capital being held which affects cash flow leading to reduced efficiency, effectiveness and distorted functionality ( Koin, Cheruiyot , and Mwangangi , 2014).

Oliveira and Rodrigues (2008) argue that inventory management has direct and significant effects on organizational efficiency or performance. Similarly, Ismail et al. (2018) carried out a study on improving distribution and business performance through lean warehousing and found that there exists a positive relationship between warehouse and performance. Likewise, Shittu et al. (2020) study revealed that inventory control significantly affects productivity of an organization. This means

that a unit increases in inventory control system will result to a corresponding increase in organizational performance.

In Ethiopia the management of educational materials got attention during the early years of the Ethiopian revolution with the establishment of department under Ministry of Education (MOE). It was established in July 1984, as an independent agency for educational materials production and distributions (EMPDA). The main responsibility of the department was handling the production, procurement and distribution of educational materials (MOE, 1989).

According to the Gurage zone polytechnic college head, Guraghe Zone Polytechnic Colleges are government owned colleges and there are only two Polytechnic Colleges in Guraghe Zone, Wolkite and Butajera. They were established 1993E.C as technical and vocational education and training (TVET) colleges to train students with 10+1 and 10+2 in certificate levels. In 2004 E.C, the schools were completely changed to Polytechnic College due to their better training competency than other similar schools; then the colleges were allowed to train students with diploma level.

Obtaining sufficient financial resources alone is not enough to achieve the intended objectives of an organization. Moreover, to carry out organization responsibilities and achieve its missions and visions, there should be effective and efficient material management. Therefore, the importance to conduct research on material management practices and its effect on organizational performance of polytechnic colleges in Guraghe zone, Ethiopia, comes from the need for better management and utilization of educational materials since the provision of quality education partly depend on the quality and better management and utilization of school materials.

## 1.2. Statement of the problem

Logistics play a pivotal role in supporting organization as they strive for more efficient management system as in the organizational practices. Inefficient management system together with the inefficient internal management would disable the organization to react the demand of customers with the lowest price at the shortest feasible time frame including the quality level which doesn't meet the customer expectation and would like the organization to the competitive disadvantage situation against the rivals (Cozzolino, 2012). Hence, in logistics management, inappropriate use of logistics activities added unnecessary cost and process for the industry. For instance, improper application of transport, warehouse, and inventory control and logistics information related problems are the basic problem that faces different organization (Rahul & Altekar, 2005).

Material is one of the major expenditures of an organization there by affecting and being affected by other economic activities (Lambert, 2001). In 1994, the USA organization spent an estimated $554 billion on transportation, more than $332 billion on storage and inventory carrying cost and the overall expenditure has been more than $900 billion (Stock and Lambert, 2001). As quoted by Weaser (2001) global organization spent about $ 3 trillion on material. This implies material has a great role on organizational performance, and it needs great management.

The importance of materials management can realized when it is said purchasing account for nearly 50 % of organizations annual expenditure: that nearly 80% of working capital is tied up the inventory carrying cost is almost 25% a year, that material represents 40-60% the sales price or 60-80% in material cost will substantially increase the profit margin of an organization (Nair, 1990).

Matopoulos and Michailidou (2013) pointed out that saving opportunities are not currently exploited by organizations due to supply chain inefficiencies, such as ineffective materials management, inadequate purchasing orders, and distortion of information flows involved in the transport and delivery of supplies to the healthcare providers. Likewise Njeru (2015) stated inefficient utilization of public money, non-

agreement with procurement policies, non-transparency and lack of accountability, poor quality goods and services and the absence of effective cost minimization of procurement expenditures have been observed in many African countries. Similarly, in many African countries enough attention was not given to effective management of public resources (Basheka, 2015).

Lack of experience in procurement workers has been leading countries for huge loss of money. As an example, USA had lost huge amount of money in auctions due to unskilled procurement officials. Kenya also lost 4.2 Kenyan shillings in 2010. In most institutions, the procured goods and services are not as such standardized and employees have been facing problems during their daily duties (Thai 2001). Similarly, African countries spent 70% of their annual budget for procurement of goods, services and works for institutional uses. The main source of procurement budget in public organizations is mainly tax payers (Mchopa, 2015). In addition, according to Ethiopian Ministry of Finance and Economic Development [EMFED] (2008), Ethiopian Higher educational institutions obtain the total procurement budget from government. 40% of the total education budget goes to Public Universities of Ethiopia; they have lion shares in this regard. However, Universities procurement has been problematic. Similarly, it has been reported that 10 to 100 million Ethiopian birr has been lost every year in Public Universities due to non-transparent procurement systems. This has been affecting the three major goals of Public Universities specifically by weakening the quality of education, the quality of the output of researches and limited community services.

High levels of inventory held in stock affect adversely the procurement performance out of the capital being held which affects cash flow leading to reduced efficiency, effectiveness and distorted functionality (Koin et al., 2014). So, organizations that have not yet adopted inventory management tools and systems are facing the challenge of stock out cost which result in a breakdown of production operation or delaying the operation, the loss of machine and man-hour, the loss of service to customers, the loss of goodwill, the loss of lagging behind in competition and loss through losing profit (Martin, 2011).

Study of Alie et al. (2017) indicated that the common problems that have seen in Ethiopian basic metal industries among other such as unbalanced demand and supply of basic metal industries, poor IT system, inefficient and faulty practice, absence of material manager, poor delivery time, poor customer satisfaction, product unavailability, material cost, and material warehouse problems. Similarly, Gudeta and Barani (2021), studied effects of logistics management on organizational performance, at Wonji or Shewa Suger Factory, the study showed that transportation, inventory, and warehouse management had positive and statistically significant effect on organizational performance. Moreover, Fekadu (2013), studied on material management practice in Ethiopia. The result of the study indicated that material management system is poor practices, and lack of coordination of goods transport, inadequate transportation vehicles in numbers, quality deterioration of goods while handling, transporting and storage.

It is common to observe the scattered equipment & assets out of the warehouse in the office compound that at risk of theft. A large number of stocks of materials are stacked in the store which is seriously exposed to dust. Sometimes, the interruption of operations is happened due to the lack of raw materials inventories and there is damage and spoilage of materials due improper placement. The materials that are broken and need maintenance are located to the different corners of the warehouse compound covered with dust. Items are not stacked in a proper way so that not easily accessible when needed for withdrawal or for execution. These and similar gaps in the public organization material management practice was observed (Dagim Woldie, 2018).

Moreover, the preliminary survey of the researcher through unstructured interview of academic staffs' perception of about material management practice of their organization, they were complaining the college managements about cases in which some educational materials have been wrongly utilized. In such a situation, it would be logical to expect some gaps in the management and utilization of educational materials. For instance, the researcher informally observed broken chairs at the back of classrooms, unused laboratory materials and teaching machinery, unmaintained old

classrooms, unmaintained teaching machinery and the like were raised by school principals to manage the educational materials.

As to the knowledge of the researcher, almost all of the developed and developing countries researches on material managements were done on business and construction organizations and there is no any research study that addressed effect of material management on public Universities of Ethiopia. All these experiences encourage the researcher to focus on this topic

Therefore, As to the knowledge of the researcher, non-existence of research done on the effect of material management practice on performance of public universities especially in polytechnic college's in Ethiopia; material management problems have been extensively studied in many developed countries, however environment of developing countries organizations different from those of developed one like the study area; as the finding of Fekadu (2013), there is a gap between theory and practice of material management in Ethiopia; and the study area shows different gaps about material management practices. Hence, the researcher assumed to answer the question of "How far materials management practices influences organizational performance in polytechnic colleges of Gurage Zon, Ethiopia?"

## 1.3. The research questions:

The following research questions were raised on the study:

1. What is the relationship between material management practices with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?
2. What is the relationship between procurement management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?
3. What is the relationship between warehouse management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?
4. What is the relationship between inventory management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?
5. How far materials management practices influences organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?

## 1.4. Objective of the study

### 1.4.1. General objective

General objective of the research was to measure the effect of materials management practices on organizational performance in polytechnic colleges of Gurage Zone, Ethiopia.

### 1.4.2. Specific Objectives

The research's specific objectives were:

1. To determine the relationship of materials management and organizational performance of polytechnic colleges of Gurage Zone, Ethiopia.
2. To determine the relationship between procurement management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia.
3. To determine the relationship between warehouse management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia.
4. To determine the relationship between inventory management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia.
5. To measure effect of materials management practices on organizational performance of polytechnic colleges of Gurage Zone, Ethiopia.

## 1.5. Significance of the study

Significances of the study would be:

1. The research findings may give indication to the management of the polytechnic colleges of Ethiopia especially to Gurage Zone polytechnic colleges about effect of materials management on organizational performance. So that, it may help to develop materials management strategies, systems and procedures with a better understanding to be effective on materials management practices.
2. The study process provided researcher an opportunity to achieve deep knowledge of conducting academic research.
3. The research findings may serve as a reference for any individuals who want to conduct further study in similar or related issue in other institutions.

## 1.6. Scope of the Study

In the study, it was impossible to cover the whole polytechnic colleges of Ethiopia because of time and budget shortage, only polytechnic colleges in Gurage Zone were selected as the study areas. Similarly, according to Gurage Zone polytechnic college head there were only two Polytechnic Colleges in Gurage Zone, Ethiopia. So, the two polytechnic colleges were selected as the study areas and from issues of polytechnic colleges, the researcher focused on effect of materials management practices on organizational performance. Moreover, even if there were different materials management practices, the study was focused on three materials management practices of procurement, warehouse and inventory since these activities were done by every polytechnic college and they have impact on performance of these schools. Furthermore, cross sectional survey data were used to collect all relevant data at a single point in time.

## 1.7. Limitations of the study

Research is complex and challenging duty for anyone, who is not experienced and familiar with caring research. The researcher faced the following constraints of: lack of experience, shortage of available materials, financial resource and time. Similarly, respondents were not punctual to their appointment since they were very busy to respond or return the questioner that waiting longer period of time affects the researcher regular time.

## 1.8. Organization of the Study

The study was organized in five chapters. Chapter one present introduction part of the study; it was comprised of background of the study, statement of the problem, research questions, objective of the study, significance of the study, scope of the study, limitations of the study and definition of key terms. Chapter two would describe about the literature review which mainly constitutes the theoretical and empirical reviews and conceptual framework model of the study. Chapter three would depict the research methodology that was applied to conduct the study. It tried to address the research design, target population, sample design, data source, questioner

design, data collection techniques and instruments, data analysis procedures, validity and reliability and potential ethical issues of the study. Chapter four was about data analysis and interpretation of the results and finally chapter five was about summery of findings, conclusion, suggestion and recommendations.

# CHAPTER TWO

# REVIEW OF RELATED LITERATURE

## 2.1. Introduction

### 2.1.1. Educational materials

Educational materials, as mentioned by Mbamba (1992), refer to “any object or unit area that designed and organized deliberately to support and used teaching and learning processes”. He further listed educational materials such as laboratories, workshops, libraries and recreational spaces that serve to house instructional activities, furniture, learning and teaching materials which act as source or channel from which learners draw knowledge and acquire skill.

On the other hand, educational materials, as to Prakasha Gurage (1998), also encompass all three- dimensional equipment as well as all graphic and written materials used in schools. Some of these materials, as mentioned by the authors, include toys and games, educational aids, basic classroom equipment and furniture, laboratory equipment, playgrounds and textbooks.

Moreover, educational materials are a broad range of materials that are found in schools which support and are used for instructional purposes. Instructional materials, as mentioned by Good (1973), refer to “ devices with instructional content or function that are used for teaching purposes”. On the other hand, Shores (1960) define instructional materials as the whole range of media through which teachers and pupils communicate. This includes books audio visual aids, flat pictures, maps, real objects, etc.

Teaching aids are instructional materials that are used in the instructional processes. They are defined by Good (1973) as auxiliary instructional devices that are used to facilitate teaching and learning processes. They are not referring to those core teaching materials that are taken as main ingredients of the teaching learning processes. So, when instructional materials are used to support the teaching learning

processes, they are taken as teaching aids. Hence, teaching aids are referring to those instructional materials that are used as supportive materials by teachers in the teaching learning process.

### 2.1.2. Types of Educational Materials

#### 2.1.2.1. Instructional Materials

These are materials that are specifically meant for direct teaching and learning. It includes classrooms, classroom seats, laboratories, libraries, experimental equipment, chalkboard, audiovisual learning equipment, zoological gardens and experimental agricultural farms. These materials bear directly on the teaching – learning process and are therefore considered of prime priority among other school materials (Lawanson, 2011).

#### 2.1.2.2. Recreational Materials

These are spaces, lawns, fields, pitches and equipment for sports, games and general recreation. Games and Sports apart from developing specific skills also develop a good learning socio-psychological as well as mental environment through relaxation. The importance and level of resources committed to the development and provision of recreational materials must not exceed their values in facilitating the overall goal of the educational institution (Lawanson, 2011).

#### 2.1.2.3. Residential Materials

These include hostels and hostel materials, refectory and refectory materials, staff quarters and other associated materials, meant to provide residential convenience for staff and students (Lawanson, 2011).

#### 2.1.2.4. General – Purpose Materials

These are materials that can easily be converted to uses other than those for which they are being used. Such materials in most cases are made of space materials. There are basically two types of open space materials namely: The developed and the undeveloped spaces. Developed Open Space is used as sporting pitches, fields, lawn, school farms, access roads, parking lots and so on. Their uses can easily be modified

as occasion demands. The Undeveloped Open Spaces are all the land area within the legal authority of the institution which is yet to be developed into specific uses (Lawanson, 2011).

### 2.1.3. Availability of Educational Materials

Conducive environment is important to note that students and indeed their teachers need to be able to teach and learn adequately and effectively. The school materials therefore, must meet the needs of the school community. Each building in the school should be having ceiled to reduce the intensity of heat. They must also be constructed with a design that makes for cross ventilation. Good sanitary facilities must be provided. Classrooms must not be overcrowded and must be spacious enough for free movement (Jacobson et al., 2003).

### 2.1.4. Concepts of Material Managements

The concept of materials management brings in the total systems approach to managing the entire flow of information, scheduling the manufacturing processes and procuring, materials and services from raw materials suppliers through factories and warehouses to the end user/customer. Materials management as a definition is the process which integrates the flow of supplies into, through and out of an organization to achieve a level of service which ensures that the right materials are available at the right place at the time in the right quantity and quality and at the right cost. Material management as a concept concerned with the management of materials until the materials have been used and converted into the final product. Activities include cooperation with designers, purchasing, receiving, storage, quality control, inventory control, and material control.

Material management is a function of coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide a predetermined service to the customer at a minimum cost. International Federation of Purchasing and Materials Management (IFPMM) also defined material management as a definite organization to plan and control all types of materials, its supply, and its

flow from raw stage to finished stage so as to deliver the product to the customer as per his requirements in time.

Material management is a process of planning, acquiring, storing, moving, and controlling materials to use facilities, personnel, resources and capital effectively. Material management is the process to provide the right materials at the right place at the right time to maintain a desired level of production at minimum cost. The purpose of material management is to control the flow of materials effectively. In the same vein, material management structure should be organized in such a way that it allows for integral planning and coordination of the flow of materials, in order to use the resources in an optimal way and to minimize costs. Material management systems should be implemented to plan, order, check deliveries, warehousing, controlling the use of materials, and paying for materials. He adds that these activities should be interrelated.

Material management as the activities involved to plan, control, purchase, expedite, transport, storage, and issue in order to achieve an efficient flow of materials and that the required materials are bought in the required quantities, at the required time, with the required quality and at an acceptable price. Materials management is a process of coordination all resources through the process of planning, Organization, stating, directing, leading and controlling to achieve desired objectives with the use of human being (by George terry).

### 2.1.5. Effective Management of Educational materials

Effective educational materials management is the function, which aims at integrating the management of materials in an organization undertaking. Its main objective is cost reduction and efficient handling of materials at all stages and in all sections of the undertaking (Kumar and Suresh, 1998).

### 2.1.6. The Role of Educational Materials in Students Learning

Education contributes to children's perceptual growth and understanding of their environment. To this effect, students learning environment should be designed in a way that can provide them greater opportunity to observe and work with various materials that play an important role in their understanding of man and his environment. In such a case, educational materials are important input components of the schools programs (Lockheed, 1991).

As mentioned by UNESCO (1984), some education systems view educational materials as teaching aids and some others view as a means for innovation. Hence, in the earlier case, educational materials except, for technical and vocational training, are considered as a tool or an aid which support or extend the act of teaching in which its uses depend on teachers will or initiative whereas, in the latter case, seen as a means for innovation, are considered as a powerful means of renewing the education system. They can also be seen as indispensable in facilitating the introduction of innovation and promoting changes in the improvement or quality of teaching.

#### 2.1.7. The Functions of Educational Materials Management

The functions of educational materials management is expressed differently by different writers. For example, Gopalakrishnan (2005) discussed that educational materials management includes planning, purchasing, allocating, storing and controlling. According to UNESCO (1984) educational materials management functions include planning, distribution and control of the utilization of materials. In both cases, there is no overlooked function but they differ only in the way they treat each of the functions.

##### 2.1.7.1. Planning for Educational Materials Management

In identifying the need for educational materials, there are two ways in which the decision as to the need for educational materials can be reached. One of the ways is to base the need on accurate information of the departments, sections or subsystems that request the materials. Requisition is a formal written request from schools, person or departments of the education system to initiate purchase of educational materials. The

other way is determining the need from the supply side. This can be done using such available data as the available number of educational materials obtained from an inventory control; utilization standard of educational materials per pupil or per group of pupils and service year of the educational materials in the schools (Dobler, 1971).

#### 2.1.7.2. Procurement or purchasing of Education Materials

Mbamba (1992) indicated that, the major function of purchasing embraces the flow of materials from the supplies to an organization which has the intention of facilitating the attainment of predetermined objectives. In a narrow sense, the term ”purchasing“ simply describes the process of buying; however in a broader sense, the term involves determining the need, selecting the supplier, arriving at a proper price terms and condition, issuing he contract or order, and following up to ensure proper delivery (Alijian, 1973).

##### 2.1.7.2.1. Purchasing Procedure

Dereje (2006) indicated that, the purchasing processes may vary according to the rules and regulations a country follows. Its basic aim is to ensure that what is needed is made available when it is required. The materials to be bought should conform to the established standards and more of instructions. But the procedure for procurement of educational materials may vary according to the nature of education; the essential steps are as follows:

1. Recognizing the need for the material by using check-up of the available stock.
2. Determining the quality of materials which will be required, regarding to the level of available funds.
3. Deciding on priority basis in relation to the available funds.
4. Drawing detailed specifications of the required items.
5. Preparing and publishing tender documents.
6. Analyzing the tenders to determine the prices, availability of materials etc

7. Based on the present proposal on the quality, quantity of items, prices, delivery date, ability of supplier, etc. approving the tenders who should supply the materials.
8. Awarding the contract for the supply of materials.

#### 2.1.7.2.2. Time for Purchasing

Timely purchasing is one of the major activities of the purchasing function. According to Gopalakrishnan (2005), for determining the right time, the purchaser should have lead time information for all products and analyses its components. Obviously, lead time covers the entire duration of the materials cycle that consists of manufacturing, transporting and inspection. If educational materials are not provided by the time they are required, it affects the teaching learning situation and quality of education negatively. To make timely purchasing the purchaser should conscious about the total time that the material requires from the point of need identification to the time they arrive to the users. It is not always the delay that creates a problem to a system. Sometimes early purchasing is also a problem in that it creates problem of storage places, for instance Right time purchasing is essential and advantageous for smoothing the function of an institution or organization (Harris, 1985). For this reason, the purchase requisition time of educational materials should be determined beforehand and be communicated to departments, sections or units of the system.

#### 2.1.7.2.3. Determining the Right Price

As mentioned by Candoli (1984), in identifying the optimum price of purchased materials, there are three types of discounts which concern the purchaser. The first is trade discount which is set by vendors on the basis of their classification of customers. Thus, the purchaser's responsibility is making his organization in the most favorable classification of customers. The second is bulk purchasing which offers lower unit prices. Here, the buyer's responsibility is to adjust ordering practice to the most advantageous quantity price break. The third is negotiating which is striving in making agreements that help the organization in saving money like seeing that proper cash discount terms are incorporated in the order, securing invoices promptly from vendors, processing invoices promptly and getting them to the proper paying agent

and securing extended discount privileges when unavoidable delays are encountered. These are some of the ways purchasers try to reach the right price.

#### 2.1.7.2.4. Identifying the Right Source

The concept of right source deals with selection of the right supplier or manufacturers of materials required. Concerning this, Harris (1985) has mentioned some points with which vendors can be evaluated. These include financial status, reference from other customers, punctuality in delivery, guaranteed service or products, discount programs and procedures, past bidding record and service offerings. On the basis of these points, vendors can be evaluated and a sort of vendor's directory, which classifies their level of dependability, can be developed. This directory will help the purchaser in identifying the right source. Similarly preparing catalogues that contains list of possible suppliers of educational materials can also help in providing information to the requisite initiating departments as well as to the purchaser. As mentioned by Curley (1968), reputed suppliers are intangible assets to any organization.

#### 2.1.7.2.5. The Right Quality for Educational Materials

According to Datta (1986), quality is the sum total of characteristics or attributes of a certain material, product or part that makes it acceptable by the people. The quality that is acceptable by the users, beyond achieving the objective it is required to, has significance in improving the morale and efficiency of the workers. At this time numerous manufacturers are engaged in producing educational materials of the same kind but of different qualities.

Though decision regarding specific quality and brand are made in cooperation with purchasing agent especially for instructional materials like textbooks, supplementary reading materials, charts, model or tools, the decision has to be made by some instructional officials or committee of teachers or educational personnel Mocoy (1961).

The purpose of specification is for quality control. However, in describing specifications, nonessential quality restrictions that do not add input to utility should

be excluded for they may add cost (Candoli, 1984). Quality should not only emphasize the technical specification but also balance the technical requirements with the economic condition. This balance may be maintained at least by setting minimum standards which could be considered during purchasing. However, this situation may lead to selection of minimum standards which may not be accepted by users. In this regard, Datta (1986) warns that even though there is a need to balance technically required materials with the economic condition it should not lead to the change of required material without the consultation of the users.

### 2.1.8. Educational Resource Allocation

Once distributed teachers too, are accountable for the loose and mishandling of textbooks and other instructional resources. This is realized by making each student sign against the books received. It is also equally important to inform parents and guardians of students through a duplicate copy of the signed papers. The signed paper or document shows the kind of instructional materials will help them to check and to continue checking the conditions of the materials, this double-checking system of the school and parents will increase the span of life of the material (Otto, 1954).

### 2.1.9. Receiving and Handling of Educational Materials

Inspecting the incoming materials keeps an organization from receiving damaged, wrong and in appropriate quantity of materials. It saves time that can be wasted by sending back wrong and damaged materials that can be received in the absence of good inspection. For this reason, assigning capable personnel for the receiving function is an important task in the management of educational materials (Knezerich & Fowlkes, 1960). Stocking involves routine activities like sorting out materials coming at the end of inspection process and storing them in their locations. Stocking is very important for easy location, proper identification and speedy issue to the consuming department. This process is very crucial in warehouses where thousands of parts are stocked for meeting consumer needs (Compton, 1970).

Materials handling can be defined as the function dealing with the preparation, placing and positioning of materials to facilitate their movement or storage. Therefore, in order to store received educational materials safely, the warehouse manager has to have all information beforehand (Datta, 1986). According to Harris (1985), some of the positive features of a centralized warehouse are that it allows better control of received items and better warehouse management through computerization, greater efficiency in space management and better management of inventory procedures and records and allows more elasticity in distribution to schools. However, unless it is well planned, though it gives elasticity for distribution, there may be problem to serve the branches by distributing from the center due to distance and being over burdened by serving all at a time. Educational materials management requires a proper warehouse in which materials can be kept safely and properly. For the proper and safe handling of educational materials, a warehouse must be dry (Harris, 1985).

According to Gopalakrishnan (2005), in stores lay out, the governing criteria are easy movement of materials, good housekeeping, sufficient space for men and material handling equipment's optimum utilization of storage space, judicious use of storage equipment's such as shelves, racks, pallets and proper preservation from rain, light and other such elements. Providing adequate storage for instructional supplies and equipment is a problem in many new school buildings because of the scarcity of more class room space and shortage of funds for construction, many schools provides a bare minimum of storage in new school plant facilities Kimbrough (1968).

The other activity that should be done in materials handling is codification. Codification is a process of identifying the stored educational materials systematically. As mentioned by Mitchell (1973), numbers or a combination of numbers and English letters can be used to codify the items of educational materials. Different educational materials may have different names by users. However, if they are coded, during the request, the store man can easily identify the materials by their codes. It helps in avoiding duplication of items and results in the minimization of the number of items, leading to accurate records. Gopalakrishnan (2005) also defines

codification as a process of representing each item by a number, the digits of which indicate the group, the subgroup, the type and the dimension of the item. As a result of rationalized codification, many firms have reduced the number of items. It enables systematic grouping of similar items and avoids confusion caused by long description of the items. Since standardization of names is achieved through codification, it serves as the starting point of simplification and standardization.

There are two types of inventories: open inventory and closed inventory. Open inventory is a condition of continuous inventory, which is done when the warehouse is functioning whereas closed inventory is done usually and the stores give up providing services and there is no delivery or receiving of goods or materials (Candoli, 1984).

### 2.1.10. Distribution of Educational Materials

Educational materials distribution involves the movement of educational materials from the warehouse facility to the requesting unit or department (Harris, 1985). Nebiyu (2000) taking the Ethiopian education system experience has mentioned some of the reasons that contribute to delay and imbalanced distribution of educational materials. These include inaccurate need requisition as a result of inaccurate data, failure to submit the requisition timely, lack of knowledge of the correct needs requisition, absence of personnel in the planning activity of educational materials, absence of adequate storage so that the warehouse personnel is obliged to free the space. In such a case, unnecessary distribution that does not consider time and need may occur.

### 2.1.11. Control of the Utilization of Educational Materials

As mentioned by Jenson (1967), some ways in which teachers can be well acquainted with educational materials is to use them effectively. Some other ways are attending educational meetings where exhibits of supplies and equipment are on display, observing demonstration of the use of certain supplies and equipment by individual firms, visiting other schools where certain materials and equipment are being used and experimenting with some particular supply item or equipment on the

recommendation of the principal or a teacher. It is not only lack of information or training that hinders the proper utilization of educational materials.

As mentioned by Wood hall (1985), the problems of maintenance, repair and replacement of parts or all of the educational materials are the major problems in utilization of educational materials in developing countries. The proper utilization of educational materials can also be hampered by other problems like failure in technical suitability or quality of the procured educational materials. As explained by Gopalakrishnan (2005), organizing a feedback mechanism which can be filled by teachers, periodic survey of the existing materials by the educational experts about their effectiveness and volume of use, requesting supervisors to note data relative to the educational materials and their use during the visit to educational institution are some of the ways in which the educational experts can obtain information and evaluate the effectiveness.

### 2.1.12. Warehouse or Store Management

"Store" is a general term describing goods, which are held in store house and stock yards. The word "Store" is also used in most organizations to designate an area in which all kinds of materials needed for production, distribution, maintenance, packing etc…which are stored received and issued (EMI, 2001).

Dobler (1977) defined, store management as process of setting and achieving goal through store management functions that utilize human, financial and material resources. Store management is responsible for each type of storage materials through proper identification of material, efficient physical handling, and protection of materials against spoilage in the warehouse; in addition, the store manager also controls the activity of materials during receiving, issuing and controlling materials recorded in the ledger in a systematic manual. Even though, receiving and store department seems unrelated, they are very important in materials management chain. according to Dobler and Burt (1990) "receiving and store operation provide both service and control function" when the receiving department is responsible for proper receiving of materials from supplies, the "Store" department is also responsible for storing materials in appropriate place in storeroom.

### 2.1.13. Maintenance of Materials and Equipment

Ray et.al (2001) stresses the point that maintenance enables the provisions of services without stoppage and in addition Elmo (1963), defines maintenance as continues process of repair and replacement of pieces of property whether grounds building or equipment as nearly as possible to the original condition of completeness. It also goes further and includes good care and wise use of materials and equipment in a proper way. According to Harries (1988) maintenance function is seen as a layman‟s job and managers usually undermine its importance. It helps in protecting further damage of the resources and lays a good ground for reuse, which offer wise, demand or force to buy the newer one, that is of course costly for the organization.

### 2.1.14. The concept of Organizational Performance

Performance centre on inputs (the effort put in) and outputs (the result of the effort put in). According to Stukhart (2007), performance is the sum of the effects of work, because they provide the strongest relationship with the organization's strategic objectives, the customer's satisfaction and the economic contributions. Brumbach (1988) asserted that performance refers to both behavior and results. Behaviors are therefore emanating from the performer and turn the performance of an abstract concept into concrete action.

## 2.2. Empirical Literature Review and Research Gaps

### 2.2.1. Summary of Empirical Literature

Cyprian B, Makori M.(2017) examined the effect of material management on the performance of Mumias Sugar Company Limited in Kenya. Stratified random sampling was used to select 79 respondents from the Company. The sample of 79 was equivalent to 10% of the target population which is regarded as statistically significant in a descriptive study with a finite universe. The study utilized a research questionnaire. Data were analyzed with the aid of the Statistical Package for Social Sciences (SPSS) to generate the required frequencies and percentages to answer the

research questions. Results reveal that materials procurement and inventory control positively influenced the performance of sugar manufacturing industries in Kenya.

Wanjogu (2015) determined factors affecting materials management in manufacturing firms in Nairobi, Kenya. The descriptive research design was adopted for the study to determine factors affecting materials management. A sample size of 46 respondents was selected from a list of 455 manufacturing firms. Data were collected via a structured questionnaire and analysis was performed with the aid of tables, charts and linear regression. Results show that good inventory control is important in materials management because it reduces stock levels and hence increases profitability. Also, ICT helps firms in planning, controlling and processing of materials. Atieno and Wanyoike (2015) also conducted an assessment of the effect of logistics management practices on operational efficiency at Mumias Sugar Company Limited, Kenya. Purposive and convenience sampling methods were used to select 92 respondents as the sample size for the study. Data were analyzed via mean, standard deviation, correlation and regression analysis. Result reveals that effective management of information flow improves the company's internal and external processes.

Ibegbulem and Okorie (2015) conducted an assessment of materials management and profitability of an organization. The study revealed that material management used by the organization contributes to the profitability of the company, adequate storage facilities prevents interruption on production process among other things. JerutoKeitany et al. (2014) assessed the role of materials management on organizational performance in Kenya. A sample of 49 respondents was selected from this population using the stratified random sampling technique. Data were collected through a structured questionnaire, consisting mainly of closed-ended and open-ended questions. The data were analyzed through descriptive statistics such as mean, standard deviation, median and percentages. Results indicate that there was a significant increase in organizational performance as a result of effective materials management.

Nwosu (2014) examined the impact of materials management on the profitability of Nigeria brewing firms. The population of this study is 4648 being the total staff strength of Nigeria Breweries and Guinness Nigeria PLCs, and a sample size of 368 was selected. Data were collected through a structured questionnaire and oral interviews, while data analysis was performed with the aid of simple percentages and Z- statistics. Result demonstrates that materials procurement, materials storage, materials inventory and interdepartmental collaboration have a significant effect on the profitability of brewing firms. Ondiek GO, Odera O (2012) did an assessment of materials management in Kenyan manufacturing firms. The study surveyed medium and large manufacturing firms based in Nairobi, Kenya. A stratified random sampling technique was used to select 55 firms while the data was collected using a structured questionnaire consisting mainly of both closeended and open-ended questions. Data were analyzed through proportions, percentages, median and mean. Results show that Kenyan firms were not practicing professionalism in materials management and owing to the huge amount of resources they were committing on materials related activities.

Asaolu et al. (2012) also examined the effect of materials management on the profitability of Nigerian Food and Beverage (F & B) Manufacturing firms with specific reference to Nigerian Bottling Company Plc. Data were collected through a structured questionnaire and personal interview. Results show that there was a significant increase in the company's profitability as a result of efficient management of materials.

Addisu (2018) carried out study on analysis of medical equipment supply chain management in public hospitals in Ethiopia and the study showed that the efficiency of medical equipment supply chain management in public hospitals is found to be strongly affected by the procurement, inventory, transportation and warehouse management practices. These variables explained 44.5 percent of the variance, efficiency of medical equipment supply chain management.

Anichebe and Agu (2013) Effects of Inventory Management on Organizational Effectiveness in selected organizations in Enugu, was carried out, to assess the impact of proper inventory management on organizational performances in Yemenite, Hardis & Dromedas, and the Nigeria Bottling Company all in Enugu, Enugu State. Descriptive research method, especially survey, and case study were employed in carrying out the study. The population of the study is six hundred and fifty-eight (658). A sample size of two hundred and forty-eight (248), was derived using the Taro Yamane formula for sample size determination from a finite population. Data were generated using questionnaire, oral interviews, observations, books, journals and the internet. Data were presented in tables and analyzed using simple percentages. Pearson product moment correlation coefficient and linear regression were used in the hypotheses testing. From the analyses, it was discovered that irrespective of the fact that the organizations studied, painted the picture that they were applying the tenets of good inventory management, they from time to time run into the problems of inventory inadequacy. This consequently affected their production, leading to the scarcity of one brand of their products or the other, thereby affecting their profitability and consequential effectiveness negatively. The Findings indicate that there is a significant relationship between good inventory management and organizational effectiveness. Inventory management has a significant effect on organizational productivity. There is a highly positive correlation between good inventory management and organizational profitability. The study concluded that Inventory Management is very vital to the success and growth of organizations. The entire profitability of an organization is tied to the volume of products sold which has a direct relationship with the quality of the product Against this background the study recommended that Organizations should diversify their inventory system to suit specific needs of production and that management should closely monitor and manipulate their inventory system to maintain production consistency for organizational profitability and effectiveness.

Edwin and Florence (2015) The Effect of Inventory Management on Profitability of Cement Manufacturing Companies in Kenya: A Case Study of Listed Cement Manufacturing Companies in Kenya. Given the milestone contribution of the Cement

manufacturing firms to the economy of Kenya, this research is necessary to evaluate the effects of inventory management on the profitability of the Cement manufacturing firms in Kenya. A cross-sectional data from 1999 to 2014 was gathered for the analysis of the annual reports for the three sampled firms listed at Nairobi Securities Exchange (NSE). The ordinary least squares (OLS) stated in the form of multiple regression models was applied in the data analysis to establish the relationship between inventory management and firm's profitability. The variables used include inventory turnover, inventory conversion period, Inventory levels, storage cost, size of firm, gross profit margin, Return on assets and growth of the firm. The results provide a negative relationship between inventory turnover, inventory conversion period and storage cost with the profitability of the company. In addition, inventory level was found to be directly related to firm's size and storage cost. The study recommends that the Cement manufacturing firms in Kenya should strive to ensure that the right stock is kept in their warehouses to hedge against excessive holding cost and stock-outs.

### 2.2.2. Research gaps

Research gaps exist on the basis of location of study area, measurement of performance in terms of procurement, warehouse and inventory of school materials management. The past studies on the effect of materials management on performance of organization reveals several gaps as summarized in empirical literature review part and the various research gaps identified give a justification that the research needed to be conducted so as to fill these gaps.

## 2.3. Conceptual framework

Saunders et al. (2007) stated that "A conceptual framework indicates how the researcher sights the concept involved in a study, especially the association among concepts". It can guide research by providing an image of theoretical constructs and variables of interest to measure the effect of materials management practices on organizational performance of polytechnic colleges of Gurage Zone.

The available literature review shows that there was statistically significant positive relationship between materials management practices and organizational performance (Gudeta and Barani, 2021; Shittu et al., 2020; Kayiranga, 2020).

Moreover, according to MOE (1989), the main responsibility of the material management department of any school is procurement, warehouse and inventory school materials that conceptual framework was assumed as:

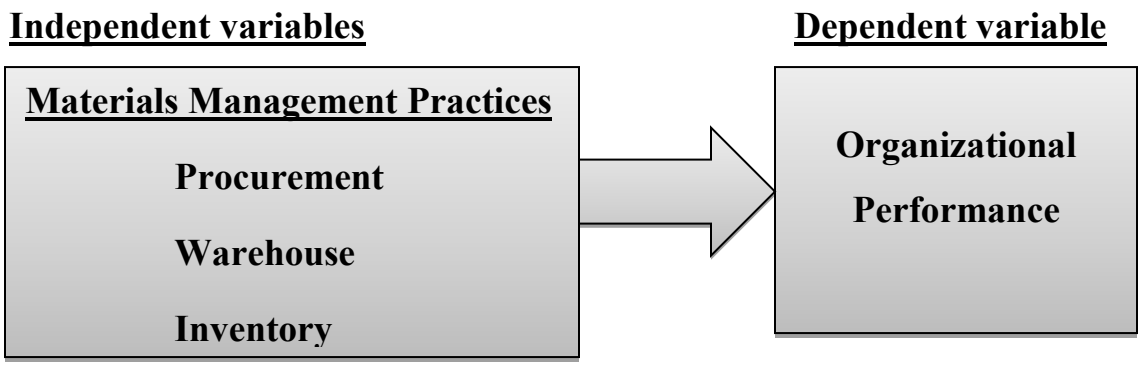



**Fig.2.1 Conceptual Framework**

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1. Introduction

This chapter discusses the methods that were adopted to measure the effect of materials management practices on organizational performance in polytechnic colleges of Gurage Zone, Ethiopia. So, chapter three focused on the following major points: research design, target population, sample frame, sample size and sampling techniques, data sources, and data collection method, method of data analysis and finally potential ethical issues of the study.

## 3.2. Research Design

According to Kothari C. (2004), research design is a conceptual structure with in which research is conducted; it establishes the blue print for the collection, measurement and analysis of data. It confirms that the study is relevant to the problem and that it uses economical procedures. In the study descriptive and explanatory research design was used in order to measure the effect of material management practices on organizational performance in polytechnic colleges of Gurage Zone, Ethiopia.

According to Kothari (1985), descriptive design is concerned with describing, recording, analyzing and reporting circumstances that exist or existed. So, descriptive research design was used in this research because the researcher wants to describe respondents' demographic characteristics that exist or existed.

Explanatory research is best to describe the characteristics of the variables and at the same time investigate the cause effect relationship between variables (Malhotra et al., 2012). The desire to know "why" is explained by explanatory research (kothari, 2004). According to McNabb David E. (2010), explanatory research aims to understand phenomena by discovering and measuring casual relations among them. Similarly, the hypothesis in an explanatory research states not only it is hypothesized that A is related to B but rather A has some particular effect on B. In other words,

explanatory research designs emphasis on determining the "why" side of correlation. So, the researcher also used explanatory research design in this research because to examine the causal relations between dependent variable and independent variables using correlation and regression analysis to measure effect of material management on organizational performance.

Similarly, With regard to research strategies or an approach, in the study quantitative approaches was used. A quantitative approach was used since it views as effective tool to gather large data and comprehensive issues at specified period of time (Ngwenya, 2010). Besides, according to Dawson (2002), the quantitative research approach allows for the collection of numerical data, the use of statistical procedures to analyze and develop inferences from that data, then measurement of variables, and the prediction**.** Therefore, in the study quantitative research approach was used to develop inferences from the collected data. Moreover, cross sectional survey was used to collect all relevant data at a single point in time.

## 3.3. Target Population

Kothari (1990) defined study population as all items in any field of study. Similarly, Mbokane (2009) defines a population as an aggregate or totality of all the objects, subjects or members that conform to a set of specifications. A population consists of individuals who possess certain characteristics or a set of features a study seeks to examine and analyze. According to Mugenda and Mugenda (2003), target population is a complete set of individuals, cases or objects of the study.

According to Gurage Zone polytechnic colleges head, in the study area, there were only two polytechnic colleges, Wolkite and Butajra. So, the study target population was all workers who were working in Gurage Zone polytechnic colleges since they were directly or indirectly participants of the colleges' material management. Moreover, according to the human resource departments of each college, the total number of the target population of the study area was 327 male and 141 female, in which the total population was 468 employees.

## 3.4. Sample Size and Sampling Techniques

According to Leedy (1989) sampling is the process of selecting, from a much large population, a group about which desire to make generalized statements so that the selected part represents the total group.

### 3.4.1. Sample Size

Along with population size and the purpose of the study, three criteria commonly need to be specified to decide the appropriate sample size: the level of precision, the degree of variability, and the level of confidence or risk in the attributes being measured (Miaoulis & Michener, 1976).

Considering the above-mentioned factors Yamane (1967) formulate the following simplified formula to calculate sample sizes:

n = N / (1 + N (e) 2), Where n is the sample size,

N is the population size, and

e is the level of precision/confidence interval.

This research study considered a 95% confidence level and a 5% confidence interval. Using the above designated statistical formula, the sample size of the study was as follows:

$n=468/ (1+ (468*0.05^2))$, Where N=468 and e=±0.05

n=216

Using the general formula above, the researcher found that sample size was 216 (46.2% of the total population).

### 3.4.2. Sampling Techniques

Sampling technique is the system of selection of individuals on which information's are to be made (Kish 1965, Gupta & Kapoor 1970). Similarly, sampling technique is a procedure used to select suitable samples to represent the entire population. There are two common sampling techniques: probability and non probability sampling. Probability sampling refers to the population that has an equal opportunity of being selected but non-probability sampling technique refers to the population that the probability of being selected is unknown (Bhattacherjee, 2012). So, the study was conducted using

probability sampling technique. The reason behind deciding to use probability sampling method was to give equal opportunity of being selected the total population. Similarly, the researcher used stratified random sampling method from probability sampling method. Stratified sampling is where the population is divided into strata (or subgroups) and a random sample is taken from each subgroup. Stratified sampling divides the universe into several sub-groups of population that are individually more homogeneous than the total population (the sub-populations differences are called strata) and items will be selected from each stratum to generate a sample. In this case, each of the stratums were more homogeneous with the population; more precise estimate will be generated from each for stratum. Subgroups might be based on company size, gender or occupation (to name but a few). Stratified sampling is often used where there is a great deal of variation within a population. Its purpose is to ensure that every stratum is adequately represented. So, the researcher used stratified random sampling to give equal chance of being included in the sample from each college, departments or processers, and gender.

Table.3.1. Sample size and sampling techniques of the study

| Core processes/ departments staffs | Total population of each colleges | | | | | | | Sample drawn (46.2%) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Wolkite | | Butajra | | Total | | | Wolkite | | Butajra | | Total | | |
| | M | F | M | F | M | F | Total | M | F | M | F | M | F | Total |
| Construction tec.dep't | 33 | 7 | 15 | 7 | 48 | 14 | 62 | 15 | 3 | 7 | 3 | 22 | 6 | 28 |
| Surveying Tech &drafting Tech. dep't | 25 | 7 | 13 | 2 | 38 | 9 | 47 | 12 | 3 | 6 | 1 | 18 | 4 | 22 |
| Automotive Tech dep't | 27 | 1 | 14 | 3 | 41 | 4 | 45 | 12 | 1 | 6 | 1 | 18 | 2 | 20 |
| Electrical Tech dep't | 13 | 10 | 6 | 2 | 19 | 12 | 31 | 6 | 5 | 3 | 1 | 9 | 6 | 15 |
| ICT dep't | 16 | 12 | 15 | 2 | 31 | 14 | 45 | 7 | 6 | 7 | 1 | 14 | 7 | 21 |
| BEI dep't | 7 | 2 | 6 | 1 | 13 | 3 | 16 | 3 | 1 | 3 | 1 | 6 | 2 | 8 |
| Metal manufacturing Tech dep't | 17 | 3 | 12 | 2 | 29 | 5 | 34 | 8 | 1 | 6 | 1 | 14 | 2 | 16 |
| Garment Tec dep't | 17 | 17 | 7 | 4 | 24 | 21 | 45 | 8 | 8 | 3 | 2 | 11 | 10 | 21 |
| Furniture making Tech and Hotel dep. | 8 | 1 | 7 | 3 | 15 | 4 | 19 | 4 | 1 | 3 | 1 | 7 | 2 | 9 |
| Common service processor | 31 | 22 | 20 | 25 | 51 | 47 | 98 | 14 | 10 | 9 | 12 | 23 | 22 | 45 |
| Tec. Transformation processor staffs | 3 | 1 | 3 | 1 | 6 | 2 | 8 | 1 | 1 | 1 | 1 | 2 | 2 | 4 |
| Human resource development | 8 | 4 | 4 | 2 | 12 | 6 | 18 | 4 | 2 | 2 | 1 | 6 | 3 | 9 |
| Total | 205 | 87 | 122 | 54 | 327 | 141 | 468 | 95 | 40 | 56 | 25 | 151 | 65 | 216 |

Source: Gurage Zone Polytechnic Colleges HRD (JANU, 2022)

## 3.5. Data Sources

The study was conducted using both primary and secondary data sources.

### 3.5.1. Primary Sources of Data

Primary sources of quantitative data were collected from the respondents or employees working in the selected organizations using structured and close-ended questionnaire.

### 3.5.2. Secondary Sources of Data

To supplement primary data, secondary sources of data were collected through extensive review of published and unpublished documents. Hence, the researcher will use secondary data through theoretical and empirical study comprised of different research studies, journals, articles, books and internet websites. Moreover, secondary data of Gurage Zone polytechnic college employees' statistical data report was used to categorize the total population.

## 3.6. Methods of Data Collection

In order to obtain information pertaining to the subject, in the study questionnaire was used as an instrument.

### 3.6.1. Questionnaires

According to Sekaran and Bougie (2013), the best instrument for the collection of primary data is structured, close-ended and well-designed questionnaire which will be a pre-formulated written set of questions to which respondents record their answers within closely defined alternatives. So, the study was conducted using structured, close-ended, well-designed questionnaire and prepared in English language. Hence, the questionnaire was consisted of two sections. The first section included demographic expressions which were designed to collect the demographic characteristics of respondents. Similarly, the second section consisted questions of effect of material management practices on organizational performance. The items that were comprised of the second section presented using a 5-point Likert scale.

Likert scale is a scale designed to study how strongly respondents agree with a statement on five-point scale of 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree (Sekaran & Bougie, 2013).

### 3.6.2. Data Collection Techniques

Bhattacherjee (2012) defined survey research as a research method involving the use of standardized questionnaire to gather data about peoples' and their thoughts, behaviors and preferences in a systematic manner. So, the study was carried out using survey research method. The questionnaire was distributed to the randomly selected sample of individuals and then collected physically from the potential respondents at their site by the researcher and the personnel assigned by the researcher for the purpose of data collection.

## 3.7. Model Specification and Description of Variables

### 3.7.1. Model Specification

Model is simplified representation of a real world process. It should be representative in the sense that it should contain the most important features of the phenomena under the study. The study employed linear regression model specifically multiple regression method. Multiple regression method is estimating or predicting value on some dependent variable given the values of one or more independent variables. Like correlation, statistical regression examines the association or relationship between variables, unlike correlation however, the prediction (Geoffrey M, 2005). So, the study was carried out using multiple regressions to determine if the independent variables explain the variance in dependent variable.

### 3.7.2. Regression Functions

The equation of regression on the study was generally built on two sets of variables, dependent variable (organizational performance) and independent variables (material management practices- procurement, warehouse and inventory).

To examine the effect of materials management on organization performance, mathematical model was used as expressed as follows;

*Organization Performance = f* (*Materials Management*)

Materials management was measured by Materials Inventory (MRI), Materials Procurement (MRP), Materials Warehouse (WRH), while organization Performance was measured by the ability to meet planned output quantities; the ability to meet effectiveness; the ability to meet efficiency.

The regression performance on selected variables was described as:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + e$

Where; Yi= organizational performance

X1: Procurement management

X2: Warehouse management

X3: Inventory management

Ɛ **i**: Model error term

β0= the y-intercept intercept term –constant which would be equal to the mean if all slope coefficients are 0 β1, β2 and β3 are coefficient associated with each independent variable which measures the change in the mean value of y, per unit change in their respective independent variables. Regress performance (as dependent variable) on the selected linear combination of the independent variables using multiple regressions.

### 3.7.3. Description of variables

#### 3.7.3.1. Procurement

Procurement is a process of identifying and obtaining goods and services. It includes sourcing, purchasing and covers all activities from identifying potential suppliers through to delivery from supplier to the users. It is favorable that the goods/services are appropriate and that they are procured at the best possible cost to meet the needs of the purchaser in terms of quality, quantity, time, and location (Manga et al., 2008).

#### 3.7.3.2. Warehouse

According to Kenyon and Meixell (2011) warehousing is the storage of components, raw materials and finished goods. The intention of warehousing is to reduce the cost of labor, space, and equipment in the warehouse while meeting the cycle time and

shipping accuracy requirements of the customer service policy and the storage capacity requirements of the inventory (Stevenson, 2009).

#### 3.7.3.3. Inventory

Stevenson (2009) defines an inventory as a stock or store of goods. The objective of inventory management is to determine and maintain the lowest inventory levels possible that will meet the customer service policy stipulated in the customer service policy (Ensermu, 2013).

#### 3.7.3.4. Organizational Performance

According to Rolstadas (1998), performance of an organizational system is a complex relationship involving seven performance criteria that must be followed: effectiveness, efficiency, quality, quality of work, innovation, productivity and profitability.

### 3.8. Reliability and Validity

#### 3.8.1. Reliability

Reliability test is an important instrument to measure the degree of consistency of an aspect which was thought to measure. According to Mahon and Yarcheski (2002), the less variation of the instruments produces in repeated measurements of a characteristic the higher its reliability. Reliability can be related to the consistency, stability and dependability of a measuring tool. In order to achieve the objective of the study, the researcher used different steps as:

- Cronbach's alpha was analyzed.
- Data were collected from respondents who have good understanding and experiences.
- Survey questionnaire were prepared based on previous study.
- The questionnaire was approved by the researcher’s advisor before distributed to the respondents.

### 3.8.2. Validity

Validity defined as the extent to which data collection method or methods accurately measure what they were proposed to measure (Sounders et al., 2012). In order to achieve this objective, the researcher used different steps as: data were collected from the trust worthy bases, and different literatures were reviewed. According to Uma (2000) suggestion, adoption of items used by previous researchers is advisable since the approval of content validity and criterion related validity of these items by aforementioned scholars.

## 3.9. Methods of Data Analysis

Creswell (2004) describes data analysis as organization, presentation, analysis and interpretation of data extracted from research collection instrument. This is to reduce intelligible and interpretable form in order to give solution to the problem statement. Following completion of data collection, data processing was conducted through filtering inaccuracy, inconsistency; incompleteness and illegibility of the raw data to make analysis very easy. To solve such problems data were edited, coded, data entry and consistency were checked.

To carry out data analysis statistical packaging for social science (SPSS) version of 20 was utilized. Hence, demographic data was analyzed using descriptive statistics analysis to summarize the data on tables of frequency counts and percentages.

Similarly, quantitative data were analyzed using Pearson correlation analysis to indicate strength and direction of linear relationship between material management practices and organizational performance. Likewise, quantitative data were analyzed using multiple linear regression analysis to measure effect of material management practices on organizational performance.

## 3.10. Potential Ethical issues of the Study

In the study, the researcher maintained objectivity, courtesy and high professional standards on scientific process and no falsification, alteration or misrepresentation of data for biased or other purposes. The study was conducted by considering ethical responsibility. The researcher also tried to protect the study participants from any sort

of problematic encounters by applying necessary precaution measures. Accordingly, the respondents were notified not to mention their identity, particularly their names while filling questionnaire. Moreover, they were assured of no meaningful damage was inflicted them because of their participation in the study by boldly explaining to them the apparent purpose of the study (which is actually for academic purpose) and ensuring the confidentiality of their identity and whole part of the information they provided for the purpose of undertaking the study.

# CHAPTER FOUR
# DATA PRESENTAION, ANALYSIS AND INTERPRETATION

## 4.1. Introduction

This chapter is divided into nine major sections. The first section display introductory part and followed by the data screening section. Then, the third section of the chapter shows reliability test result and validity. The fourth section demonstrates preliminary test of assumptions of linear regression analysis. The fifth section illustrates demographic profiles of the respondents. The six section shows correlation analysis between independent and dependent variables. Seventh sections find out regression analysis to measure effect of material management practices on organizational performance in polytechnic colleges in Gurage Zone".

## 4.2. Data Screening

The primary emphasis of the study was to measure effect of material management practices on organizational performance in polytechnic colleges in Gurage Zone. So, primary data were collected from the selected organizations using questionnaires and interview. 216 questionnaires were distributed to employees of selected organizations but 209, which are 96.8% of total distributed questionnaire were collected and the rest, that was 3.2%, was not returned because employees were not volunteer to respond the questionnaire. From the returned 209 questionnaires 204 were found to be valid, which is 94.4% of the total distributed questionnaires. Then, the collected data were categorized and coded on pre-drafted coding sheet and were entered into SPSS version 20 for preparation of analysis. Every variable was checked and the tables related to the frequencies, and the maximum and minimum values for each item, which revealed no entry mistakes.

## 4.3. Reliability Test Results

In order to achieve Reliability objective, the researcher was taken Cronbach's alpha analysis. Cronbach's alpha is one of the most commonly standard measures of

reliability. It measures the internal consistency of the items in a scale. It specifies the extent to which the items in a questionnaire are related to each other. The most commonly accepted value is 0.70. Nevertheless, it should be equal to or higher than that value to grasp internal reliability (Hair et al., 2003).

Table 4.1 Cronbach's Alpha values of Variables

**Reliability Statistics**

| Variables | Cronbach's Alpha | N of Items |
|---|---|---|
| Procurement management | 0.797 | 6 |
| Warehouse management | 0.747 | 8 |
| Inventory management | 0.773 | 7 |
| Total material management | 0.822 | 21 |
| Organizational Performance | 0.905 | 19 |

Source: Data Computation of 2022

Table 4.1, Cronbach‘s alpha coefficients for procurement management, warehouse management, inventory management, total material management and organizational performance were above 0.70, that show good reliability of variables measurements.

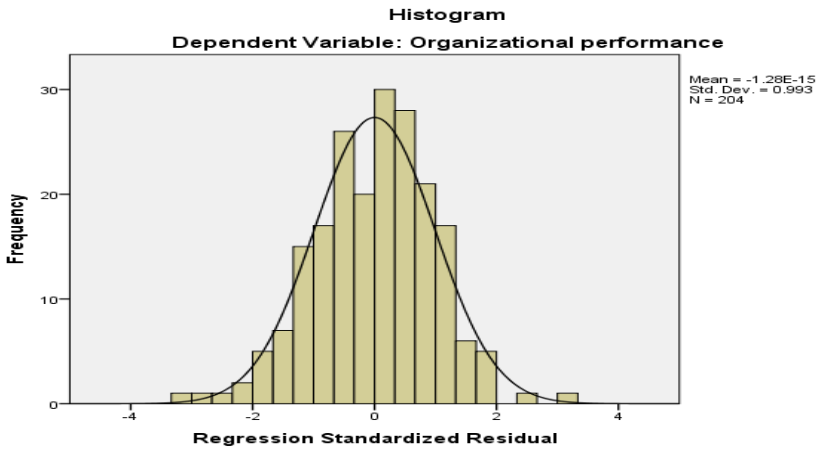
## 4.4. Test of Regression Assumptions

Parametric inferential tests are carried out on data that follow certain parameters: the data should be normal, data should be at least in interval/continuous level, independent samples, and furthermore, the samples should not be multi-collinear, and linearity assumptions should be fulfilled. Reliability and validity tests were also have been checked. Unless these assumptions are fulfilled, it cannot be possible to go forward. Instead it needs to go to searching other testing mechanisms such as non-parametric statistical methods. Hence before conducting such tests this criterion should be assured and the tested variables revealed that all assumptions were almost fulfilled.

### 4.4.1. Normality Test/ Test for Normal Errors

When we take the analysis data in inferential statistics like multiple regressions the value should be in a normal distribution across the samples. This means errors are normally distributed and that a plot of the value of the residuals will approximate a normal curve (Kothari, 2004). After completing the model and the parameters, the results indicate that they fitted a model and the model assumptions bias needs to be checked. This is done in three ways: the histogram, the normal probability plot and the Zresid vs. Zpred scatter plot. The best way to evaluate how far the used data are from a Gaussian (normal) is to look at a graph and see if the distribution grossly deviates from a bell-shaped normal distribution. The histogram looks symmetric and the normal p-p plot showed fairly consistent with that of the line and the residuals are normally distributed. Therefore, according to these findings this assumption was fulfilled (see the following graph).

Fiug.4.1. Normal p-p plot




Source: Survey result, 2022

### 4.4.2. Test of Multi-Colinearity

Cohen et al (2011) argues that there are some assumptions that need to be met in order to make sure that the regression model has a strong fit. This study as indicated above, data met these assumptions as follows: the measurements are from a

probability-based sample, data are collected by Likert scale which is considered as interval, there are no extreme outliers, there is an approximate linear relationship between the dependent variable and the independent variables, the dependent variable is approximately normally distributed and data values are independent of each other, there is no multi co linearity between variables.

Multi-co linearity means that there is a linear relationship between the explanatory variables which may cause the regression model biased (Kothari, 2004). In order to examine the possible degree of multi-Co linearity among the explanatory variables, Variance Inflation Factor (VIF) technique is also employed to detect the problem. Theoretically, a VIF greater than 10 suggest that the concerned variable is multi-collinear with others in the model and may need to be excluded from the model (Robert et al., 2008). But in the case of this study, the VIF result of SPSS output in table below indicated that none of the VIFs is excessively high, suggests that there is no perfect or strong Co-linearity between explanatory variables. So this assumption is fulfilled.

Similarly, Collinearity can be checked by tolerance values. Tolerance is an indicator of how much of the variability of the stated independent variable is not explained by the other independent variables in the model and is calculated using the formula 1–R2 for each variable. According to Sekaran and Bougie (2016), acceptable value of tolerance value is above 0.10. In the case of this study, tolerance values result of SPSS output in table below indicated that none of tolerance values is excessively low, suggests that there is no perfect or strong Co-linearity between explanatory variables. So this assumption is fulfilled.

Table 4.2., Multicollinearity Test on Tolerance values and Variance Inflation Factor

**Coefficients[a]**

| Model | | Collinearity Statistics | |
|---|---|---|---|
| | | Tolerance | VIF |
| 1 | (Constant) | | |
| | Procurment management | .460 | 2.174 |
| | Wherhouse management | .420 | 2.381 |
| | Inventory management | .361 | 2.773 |

Source: Author's Survey Data Computation of 2021

### 4.4.3. Test for Interval Level/ Continuous Scale Data

To wellbeing of parametric statistical analysis, data should be measured by continuous interval level (Kothari, 2004). The researcher was used a five level Likert scale to measure each variable. Then each variable consists of the sum of many items averaged to give the mean score. Since the data were created by calculating a composite score of mean from multiple items than a single mean for procurement, inventory, and warehouse. Therefore a series of multiple items was averaged and used to test dependent, and independents, meaning, numbers can be added, subtracted, multiplied and divided. Hence these assumptions were fulfilled.

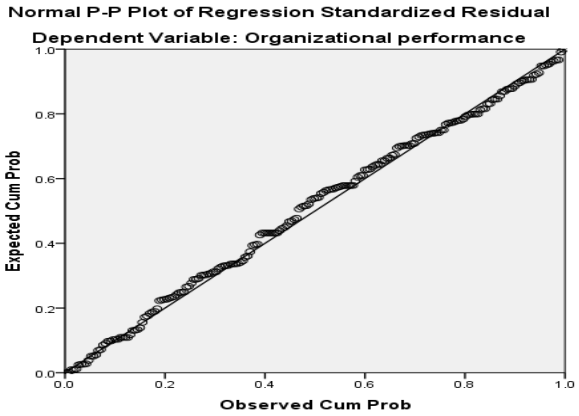
### 4.4.4. Independence Observation

Two observations are independent if the occurrence of one observation provides no information about the occurrence of the other observation. In other words, it is the correlation between errors. The independence observations are tested by Durbin-Watson coefficient (Robert et al., 2008). The test statistic coefficient should be between 1.5 and 2.5, which mean residual are uncorrelated. As indicated in table 13 below (multiple regression, ANOVA table), the Durbin-Watson coefficient was 1.592. Therefore, this assumption is fulfilled.

### 4.4.5. Test of linearity

Simple linear regression is based on finding the straight line on a scatter graph that fits the scatter points best, i.e. as closely possible (Robert et al., 2008). Regression procedures assume that the dispersion of points is linear. Where the amount of scatter around the line varies markedly at different points and forms a pattern, then the use of regression is questionable. As we can see from the output graph below, the regression line sloping from bottom right to top left, which indicates a positive relationship between the dependent and independent variables. Moreover; The P-P plots look like a diagonal line; dots lie almost exactly along the diagonal line. Therefore, this assumption is fulfilled.

Figure 4.2,: Model assumptions of linearity



## 4.5. Demographic Characteristics of Respondents

The demographic profile of 210 employees, who were participants of the study, is summarized below in the form of frequencies and percentages.

Table 4.3: Frequency table of Demographic profile of the respondents

| Demographic variable | Category | Frequency | Percent | Cumulative Percent |
|---|---|---|---|---|
| Sex | Male | 154 | 73.3 | 73.3 |
| | Female | 56 | 26.7 | 100.0 |
| | Total | 210 | 100 | |
| Age | 18-30 | 89 | 42.4 | 42.4 |
| | 31-40 | 87 | 41.4 | 83.8 |
| | 41-50 | 21 | 10.0 | 93.8 |
| | 51-60 | 13 | 6.2 | 100.0 |
| | Total | 210 | 100.0 | |
| Educational level | less than certificate | 17 | 8.1 | 8.1 |
| | Certificate | 10 | 4.8 | 12.9 |
| | Diploma | 35 | 16.7 | 29.5 |
| | Degree | 133 | 63.3 | 92.9 |
| | Master | 15 | 7.1 | 100.0 |
| | Total | 210 | 100.0 | |
| Marital status | Married | 125 | 59.5 | 59.5 |
| | Unmarried | 75 | 35.7 | 95.2 |
| | Divorced | 8 | 3.8 | 99.0 |
| | Widowed | 2 | 1.0 | 100.0 |
| | Total | 210 | 100.0 | |
| Work experience | 1-3 year/s | 64 | 30.5 | 30.5 |
| | 3-6 years | 87 | 41.4 | 71.9 |
| | 6-9 years | 31 | 14.8 | 86.7 |
| | 9-12 years | 15 | 7.1 | 93.8 |
| | more than 12 years | 13 | 6.2 | 100.0 |
| | Total | 210 | 100.0 | |

Source: Author's Survey Data Computation of 2021

As far as gender characters' of respondents is concerned table 4.5., above shows that, 73.3% of the respondents were male while the rest of 26.7% were females. This implies that the involvement of men and women in the colleges was not equal. But

both genders were involved proportionally in the study that the findings of the study did not suffer from gender bias.

In terms of age of respondents is concerned table 4.5., showed that, 42.4% of the respondents were within age group of 18-30 years, 41.4% of the respondents reported belong to 31 to 40 years of age group. The remaining 10.0% and 6.2% of the respondents were belonged to 41 to 50 years of age group and 51- 60 years of age groups respectively. The age group result indicated that respondents were well distributed in terms of their age groups and more than half of the academic staffs (83.8%) were young and have an age between 18 - 40 years. This implies that the respondents were comprised of heterogeneous groups; which in turn enabled the researcher to get varied responses across the sample units fairly distributed. Hence, again the study did not suffer from age group bias.

In terms of marital status are concerned, table 4.5 showed that, 35.7% of employees were single; 59.5% were married; 3.8% were divorced and 1.0 % was widowed. This implies that more than half of staffs have experience of marriage.

As to qualification of the respondents (table 4.5) 8.1% of respondents hold less than certificate, 4.8% of respondents hold certificate, 16.7% of respondents hold diploma, 63.3% of them were degree holders and 7.1% of respondents were master's holders. The result showed, the respondents were well distributed in terms of their qualification.

When organizational experience was examined, it can be seen from table 4.5, 30.5% of academic staffs worked for 1- 3 years; 41.4% of them had an experience between 3-6 years; 14.8% had tenure between 6-9 years, 7.1% of them had tenure between 9-12 years and only 6.2% of them worked more than 12 years. This shows that more than half of staffs 71.9% of respondents had worked in their respective colleges for less than 6 years.

## 4.6. Correlation Analysis between Independent and Dependent Variables

Correlation analysis was performed to obtain initial insight into the directionality and significance of relations among the variables of independents. This study employs the Pearson correlation which measures the linear association between two metric variables (Robert & Richard, 2008). The test also indicates the strength of a relationship between variables with a value that can range from -1.00 to 1.00; when 0 indicates no relationship, -1.00 indicates a negative correlation, and 1.00 indicates a perfect positive correlation (Pallant, 2010). For the rest of the values is a small correlation for value 0.1 to 0.29, medium correlation of 0.3 to 0.49, high correlation for 0.50 to 1.0 (Pallant, 2010).

Table 4.4: Correlation Matrix between Variables

**Correlations**

| | | PM | WM | IM | MM | OP |
|---|---|---|---|---|---|---|
| Procurment Management | Pearson Correlation | 1 | .651** | .711** | .885 | .715** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 204 | 204 | 204 | 204 | 204 |
| Wherhouse Management | Pearson Correlation | .651** | 1 | .741** | .887** | .682 |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .000 |
| | N | 204 | 204 | 204 | 204 | 204 |
| Inventory Management | Pearson Correlation | .711** | .741** | 1 | .912** | .677** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 204 | 204 | 204 | 204 | 204 |
| Material Management | Pearson Correlation | .885** | .887** | .912** | 1** | .774** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 |
| | N | 204 | 204 | 204 | 204 | 204 |
| Organizational Performance | Pearson Correlation | .715** | .682** | .677** | .774** | 1** |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 204 | 204 | 204 | 204 | 204 |

Source: Survey Data Computation of 2022

The correlation between organizational performance with procurement management, as it was indicated in the table above showed that there exists positive and high correlation (r=.715** and p=000). This result shows that change in procurement management changes organizational performance in the same direction.

Similarly, the relationship between organization performance with warehouse management was statistically significant at a p value of (0.000) with highly and positively correlated (r=.682**). This shows that a change in warehouse management lead to a change in organizational performance in the same direction.

In addition, the relationship between organization performance with inventory management was high and positive correlation (r= .677** and p=0.000). This shows that a change in inventory management changes organizational performance in the same direction.

Moreover, the relationship between organization performance with material management was high and positive correlation(r= .774** and p=0.000). This shows that a change in material management changes organizational performance in the same direction.

Generally, all independent variable and its components were correlated positively and their correlation strength was high with organization performances.

## 4.7. Regression Analysis

### 4.7.1 Multiple Regression Analysis of Organization Performance

Cohen et al (2011) argues that there are some assumptions that need to be met in order to make sure that the regression model has a strong fit. This study as indicated above, data met these assumptions as follows: the measurements are from a probability-based sample, data are collected by Likert scale which is considered as interval, there are no extreme outliers, there is an approximate linear relationship between the dependent variable and the independent variables, the dependent variable is approximately normally distributed and data values are independent of each other, there is no multi co linearity between variables.

Regression analysis was conducted to know by how much the independent variable explains the dependent variable and to see the significance of each variable. A standard multiple regression was performed between organization performance as the dependent variable and procurement management, warehouse management and inventory management as independent variables.

As clearly indicated in methodology part, the regression equation took the following form:

$Y= \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \varepsilon$

Where,

Y = Organization Performances (OP)

$\beta0$ = Constant Term

$\beta1, \beta2, \beta3, \beta4,$ = Estimated Coefficients

X1 = Procurement Management (PM)

X2 = Warehouse Management (WM)

X3= Inventory Management (IM)

In the model, $\beta0$ = the constant term while the coefficients were used to measure the sensitivity of the dependent variable (Y) to a unit change in the predictor variables. $\varepsilon$ is the error term which captures the unexplained variations in the model.

The SPSS output of regression result is divided into three section. The top sub table summarizes the model summary to the regression, the middle sub table discussed ANOVA, indicates overall significance. Moreover, the third panel gives information about each regression coefficient. The results were illustrated in table below.

#### 4.7.1.1. Model Summary of Organizational Performance

Table 4.5 Model Summary Organizational Performance

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change |
| 1 | .786[a] | .618 | .612 | .60449 | .618 | 110.897 | 3 | 206 | .000 |

a. Predictors: (Constant), Interactional, Procedural and Distributive Justice

Survey result, 2022

The model summary table provides the R, R2, adjusted R2, and the standard error of the estimate, which can help in determining how successful the model is in predicting the outcome (Cohen et al 2011).

R can be considered as one measure of the quality of the prediction of the dependent variable relationship of the independent variables. However R square tends to somewhat overestimate the success of the model when applied to the real world, so an adjusted R square value is calculated which takes into account the number of variable in the model and the number of observations our model is based on. Accordingly, in this study R-Square was found to be 0.618 which indicates that 61.8% of variance in organization performance is explained by material management dimensions of procurement management, warehouse management and inventory management, the remaining is explained by other variables which are not explored in this study.

#### 4.7.1. 2. ANOVA output of Organizational Performance

Summary table of analysis of variance (ANOVA) shows the various sum of squares described in the table and the degrees of freedom associated with each. From these two values, the average sums of squares (the mean squares) can be calculated by dividing the sums of squares by the associated degrees of freedom. The most important part of the table is the F-ratio, which is a test of the null hypothesis that the regression coefficients are all equal to zero.

Table 4.6: ANOVA of independent variables (b) as predictors' of organizational performance

**ANOVA[a]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 171.513 | 3 | 57.171 | 101.984 | .000[b] |
| | Residual | 112.118 | 200 | .561 | | |
| | Total | 283.631 | 203 | | | |

a. Dependent Variable: Organizational performance

b. Predictors: (Constant), inventory management, procurement management, warehouse management

Source: Survey result, 2022

The above table, analysis of variance is highly statistically significant (0.000) at the 5 % level of significance and F ratio is 101.984, demonstrating that the relationship between the independent and dependent variables is strong. In conclusion and from the above results, both model summary and ANOVA table showed that a significant fit of the data overall and prove that the model enhances our capability to expect the dependent variable. This result tells us that there is less than a 0.1% chance that F-ratio this large value would happen if the proposed null hypothesis about F- ratio was true. Therefore, we can conclude that our regression model results is significantly better predictor of organization performance and the regression model overall predicts organization performance significantly well.

#### 4.7.1.3. The regression coefficients of predictor

The strength of each predictor (independent variable) influencing criterion (dependent variable) can be examined on Unstandardized Beta coefficients. The regression coefficient explains average amount of change in the dependent variable that is caused by a unit change in the independent variable.

**Table 4.7: Regression coefficients of organizational performance**

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.120 | .146 | | 7.669 | .000 |
| | Procurement Management | .357 | .058 | .400 | 6.098 | .000 |
| | Warehouse Management | .276 | .065 | .290 | 4.222 | .000 |
| | Inventory management | .169 | .070 | .179 | 2.413 | .017 |

a. Dependent Variable: Organizational performance

The value for the intercept (a) in the regression equation on the first row is constant. The numbers below the column "β" are the values for the regression coefficients for procurement management, warehouse management and inventory management. In the multiple regression, this standardized regression coefficient Bate (β) is useful, because it allows you to compare the relative strength of each independent variable's relationship with the dependent variable (Pedhazur, 1982).

As shown above, effect of procurement management on organizational performance is significant (t =6.098, p = 0.000 < 0.05). The raw score regression coefficient or slope (β1) is displayed in SPSS under β as the second line and is .058. This means for every one unit rise (1 unit procurement management) in β, organizational performance rise by .058.

Similarly, when we see effect of warehouse management on organizational performance the above table revealed that positive and significant direct effect between warehouse management and organizational performance (t =4.222, p = 0.000< 0.05). This means for every one unit rise in warehouse management in β, organizational performance rise by .065.

Likewise, when we see effect of inventory management on organizational performanc**e** the above table revealed that positive and significant direct effect between inventory management and organizational performanc**e** (t =2.413, p = 0.017< 0.05). This means for every one unit rise in inventory management in β, organizational performanc**e** rise by .070.

Generally, the effect of the four independent variables was significant and the overall regression model expressed by the following box:

**Y = 6.108+.058 X1 +.065 X2 +.070X3 + e**

Where: Y = Organizational Performanc**e**

X1 = Procurement Management

X2 = Warehouse Management

X3 = Inventory Management

e = Random Error

# CHAPTER FIVE

# SUMMARY OF RESULTS CONCLUSION AND RECOMMENDATIONS

This chapter sketches brief summary of the study, conclusions of the study in accordance with the study results and forward recommendations based on the overall results of the study.

## 5.1. Summary of results

The researcher measured effect of materials management practices on organizational performance in polytechnic colleges of Gurage Zone, Ethiopia. The study was conducted on polytechnic colleges of Gurage Zone. The following six research questions were raised: What relationship is there between material management practices with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia? What relationship is there between procurement management with organizational performance? What relationship is there between warehouse management with organizational performance? What relationship is there between inventory management with organizational performance in polytechnic colleges of Gurage Zone, Ethiopia? and how far materials management practices influences organizational performance in polytechnic colleges of Gurage Zone, Ethiopia?
In order to meet the general objective, stratified random sampling followed by simple random sampling method was used.

Based on the objective of the study, research questions and hypothesis the questionnaire (survey instruments) for measuring the research variables were selected and organized. From 216 distributed questionnaires 204 (94.4%) questionnaires were used for analysis. The collected data were analyzed using statistical package for social science software (SPSS) version 20. Regression analyses were employed to explore the research questions.

Prior to applying regression analysis for testing research questions, assumptions of regression and reliability test were carried out. With regard to reliability test Cronbach Alpha result showed procurement management, warehouse management, inventory management, total material management and organizational performance were above 0.70, which all results are on general acceptable level. With regard to other assumptions of regression test results showed that there were no significant data problem that would lead to say the assumptions of regression analysis had been seriously violated.

The Pearson correlation Coefficient analysis showed that relationship between material management and organizational performance was high, positive and significant ($r= 774^{**}$, $P<0.05$).

Regression analysis was conducted to examine the effect of material management on organizational performance. The results showed that effect of material management on organizational performance accounted for it explains 61.8%of the variation in organizational performance which statistically significant $F = 110.9$, $p<0.001$.

## 5.2. Conclusion

The aim of this study is to examine the effects of material management on organizational performance at polytechnic colleges of Gurage Zone, Ethiopia. Both the correlation and regression analysis revealed that the material management show positive significant effect on organizational performance. So, the study concludes that effective materials management is a veritable tool to organization performance, which indicates the more materials management the more will be achieved organizational performance.

The result showed that the effect of all the three material management dimensions under study would positively and significantly effect on organizational performance of polytechnic colleges of Gurage Zone, Ethiopia.

The study concludes that procurement management has significant and positive effect on the performance of the polytechnic colleges of Gurage Zone, Ethiopia, which indicate the more procurement management the more will be achieved organizational performance.

The study also concludes that warehouse management has significant and positive effect on the performance of the polytechnic colleges of Gurage Zone, Ethiopia, which indicate the more warehouse management the more will be achieved organizational performance.

The study also concludes that inventory management has significant and positive effect on the performance of the polytechnic colleges of Gurage Zone, Ethiopia, which indicates the more inventory management the more will be achieved organizational performance.

## 5.3. Recommendations and Suggestions for Future Study

The researcher forwards the following recommendations to the colleges and suggestions to other researchers.

### 5.3.1. Recommendations

The study recommends management should embrace effective materials management especially in the area of materials procurement, materials warehouse and materials inventory in order for the organization to achieve its vision.

Public organizations should strive to strengthen their procurement plan and make a good culture so as to ensure successful implementation of their organizational plan and to achieve their organizational goals and objectives. And procurement plan must be fully integrated with the strategic plan and budget of the public administration. Procurement plan is specifically designed to assure that funds are available for the procurement, that the proper method of procurement is undertaken, and that the type of contract chosen will be suitable for the particular procurement of goods, works, or services.

The study advocated that a lot of emphasis need to be directed to warehouse management and performance measurement based on key performance indicators and the enterprise should maintain the effort made on response time in enhancing performance of their warehouse which is still need to be improved and also the warehouse manager of the enterprise should know the level of efficiency in the warehouse and makes sufficient amount of effort in utilizing of key performance indicators to measure warehouse performance by placing efficiency(performance) level targets.

The study advocated that a lot of emphasis need to be directed to quality and cost indicator in order to achieve significant cost savings from minimized total cost of warehousing and improved quality. The organizations should give ranked emphasis to each of the performance indicator of warehouse to identify which dimension contributed a lot in enhancing performance.

The organization should assure quality aspects through each and every activities of the warehouse like marinating good quality procedure manual, inventory accuracies by placing products in their designated place, picking or loading accurately and reducing accidents. The organization should exert a tangible effort in reducing total cost of warehouse (carrying or holding cost) includes cost of product damage, cost of obsolescence, rental costs, insurance costs and etc. Likewise, the organization should assure the level of satisfaction of warehouse customers (Suppliers and internal customers) by reducing the total serving time.

Moreover, inventory management system of the organization should apply the appropriate inventory management techniques to cope-up problems related with poor inventory handling and costs that arise, because much accumulation of inventories makes the carrying cost higher. So the company must have detailed plan based on demand forecasting.

### 5.3.2. Suggestion for further Research

Future studies can investigate this issue in other companies or conduct cross-company studies. Second, this study used a cross-sectional design and cannot reflect the lag time or long-term effects of material management. Therefore, future studies could conduct longitudinal studies to examine the relationship between material management and organizational performance. Moreover, the study variables were procurement, warehouse and inventory control systems. Thus, there is a need for future examination of variables like organizational culture and risk assessment the material management area of the organization.

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# Appendix

## Section 1 – Demographic Information

Please complete the following biographical information by circling your correct choice.

1. Gender 1.Male 2. Female

2. Age group 1.18-30 2.31-40 3. 41-50 4.51-60

3. Marital status 1.Single 2.Married 3.Divorced 4. Widowed

4. Educational level: 1.Below certificate 2.Certificate 3.Diploma 4. Degree 5.Master

5. Work experience in the College 1.1to 3 years 2.3 to 6 years 3.6 to 9 years 4.9 to 12 years 5.above 12 years

## Section 2- Material Management Practices Questionnaire

The following material management practices questionnaires have three subparts; procurement management practices, warehouse management and inventory management practices questionnaires. Please respond to the following questions on your perception of material management practices in your organization by putting a thick mark (√) in your option. Please choose from the following rating: Strongly disagree, Disagree, Neutral, Agree, and strongly agree.

2.1. **Procurement Management Practices** Questions

| No. | Procurement Management Items | 1 Strongly disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 strongly agree |
|---|---|---|---|---|---|---|
| 1 | There is no delay in purchasing of the required item | | | | | |
| 2 | There is classification of school equipment for procurement and budget allocation | | | | | |
| 3 | Procurement is being processed based | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | on procurement plan | | | | | |
| 4 | There is appropriate forecasting & follow up to procure efficiently and effectively | | | | | |
| 5 | The procurement process is not violate procedure | | | | | ` |
| 6 | There is no late submission of material request | | | | | |

**2.2. Warehouse Management Practices Questions**

| No. | Warehouse Management Items | 1 Strongly disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 strongly agree |
|---|---|---|---|---|---|---|
| 1 | There is a warehouse you would like to work in | | | | | |
| 2 | Receiving and shipping processes, and inventory levels are adjust with suppliers and customers | | | | | |
| 3 | The response to mistakes and errors is immediate. | | | | | |
| 4 | The organization of the picking process is well-designed. | | | | | |
| 5 | Materials are stored on their right locations. | | | | | |
| 6 | Material is moved over the shortest/best possible distances. | | | | | |
| 7 | The work processes are ergonomically well-thought over. | | | | | |
| 8 | Facility is clean and has a good work atmosphere. | | | | | |

### 2.3. Inventory Management Practices Questions

| No. | Inventory Management Items | 1 Strongly disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 strongly agree |
|---|---|---|---|---|---|---|
| 1 | All material available are listed and appropriately documented | | | | | |
| 2 | The material management committee is well functional to manage the inventory | | | | | |
| 3 | Poor record keeping(Bin card, stock card, model 19, model 22) | | | | | |
| 4 | Manual inventory management system is well implemented | | | | | |
| 5 | Physical inventory is done quarterly | | | | | |
| 6 | The right amount of goods are ordered and received at the right time | | | | | |
| 7 | There are skilled internal supervisor and auditor to control the inventory | | | | | |

**2.4. Organizational Performance Questionnaire**

Please respond to the following questions on your organizational performance by putting a thick mark (√) in your option. Please choose from the following rating: Strongly disagree, Disagree, Neutral, Agree, and strongly agree.

| No. | Organizational Performance Items | 1 Strongly disagree | 2 Disagree | 3 Neutral | 4 Agree | 5 strongly agree |
|---|---|---|---|---|---|---|
| 1. | **Cost minimization** | | | | | |
| 1.1. | Our organization always plans to minimize Cost. | | | | | |
| 1.2. | Our organizational revenue has always exceeded the expenditure. | | | | | |
| 1.3. | Our organization minimizes total material carrying or holding cost. | | | | | |
| 1.4. | Our organization minimize total product damage like product deterioration, breakage, leakage etc. | | | | | |
| 2. | **Effectiveness** | | | | | |
| 2.1. | Our organization effectiveness is always indicated in meeting functional responsibilities. | | | | | |
| 2.2 | Our organization always provides useful services to the people as they need them | | | | | |
| 2.3. | Our organization always serves a large number of clients in a short period of time. | | | | | |
| 2.4. | Our organization always provide high | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | quality of services to people | | | | | |
| 2.5. | Your business always provides high quality goods to the users. | | | | | |
| 2.6. | The purchasing practice of our organization is effective in improving organizational performance. | | | | | |
| 2.7. | The purchasing practice of our organization contribute to organizational performance | | | | | |
| 2.8. | Our organization minimizes machine down time. | | | | | |
| 3 | **Efficiency** | | | | | |
| 3.1. | Our organization always meets its stated goals with an acceptable outlay of resources. | | | | | |
| 3.2. | There is efficient allocation of resources in this our organization. | | | | | |
| 3.3. | There is always accomplishment of the objectives in our organization with minimal costs. | | | | | |
| 3.4. | Our organization has always met its set goals and objectives using the available resources. | | | | | |
| 3.5. | Our organization minimizes scrap and rejects materials. | | | | | |
| 3.6. | Our organization material management practice reduces resource wastages. | | | | | |