EFFECT OF BUDGETING PROCESS ON UTILIZATION OF SCIENCE INSTRUCTIONAL RESOURCES IN SECONDARY SCHOOLS IN NAIROBI COUNTY, KENYA

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DECLARATION

This is my original work and has not been submitted for degree in any other university.

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DEDICATION

I dedicate this thesis to my late uncle who was my mentor and role model George Ochieng' Mukulo for his belief in my academic from a tender age.

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ABBREVIATIONS AND ACRONYMS

BIS	Budget Information System
BOM	Board of Management
CAL	Computer Assisted Learning
CVI	Content Validity Index
ECD	Early Child Education
ECSRs	Economic, Social and Cultural Rights
FDSE	Free day Secondary Education
FDSE	Free Day Secondary Education
FPE	Free Primary Education
HOD	Head of Department
ICESCR	International Convention for Economic, Social and Cultural Rights
ICESCRs	International Convention on Economic, Social and Cultural Rights
ICT	Information and Communication Technology
IPAR	Institute of Policy Advocacy and Research
IPT	Information Processing Theory
JICA	Japan International Cooperation Agency
KAEAM	Kenya Association of Educational Administration and Management
KCPE	Kenya Certificate of Primary Education
KCSE	Kenya Certificate of Secondary Education
KIPPRA	Kenya Institute of Public Policy Research and Analysis
KNEC	Kenya National Examination Council

LCD	Liquid Crystal Display
MOEST	Ministry of Education Science and Technology
MTP	Medium Term Plan
NGOs	Non-Governmental Organizations
PCA	Principal Content Analysis
PPADA	Public Procurement and Asset Disposal Act
PPDA	Public Procurement and Disposal of Assets Act
PTA	Parents and Teachers Association
SMASSE	Strengthening of Mathematics and Science Subjects in Secondary Schools
SSA	Sub-Sahara Africa
STI	Science, Technology and Innovation
UDHR	Universal Declaration of Human Rights
UK	United Kingdom
UPE	Universal Primary Education
USA	United States of America
WDE	World Declaration on Education

ABSTRACT

Science Education is a pillar in technological advancement, national wealth creation, health improvement, and spearheading industrialization of any nation. However, low achieving learners in sciences in national examinations has remained a challenge in Kenya and Sub-Saharan Africa. Studies have attributed low learner achievement in science subjects to inadequacy, unavailability and inappropriate utilization of instructional resources. The purpose of this study was to examine the effects of budgeting process on utilization of science instructional resources in secondary schools in Kenya. The objectives were to assess the influence of policy framework, stakeholder participation, budget planning, budget monitoring and budget control on utilization of instructional resources; and the relationship between utilization and learners` achievements in science subjects' in secondary schools in Nairobi County. The study was anchored on information processing theory and employed correlation research design to provide a statistical measure on the influence of budgeting process on utilization of instructional resources and how it affects learning outcomes in science based disciplines. The study targeted 132 principals, 1,491 science teachers and 23,393 form 4 students from public and privates secondary schools in Nairobi County to obtain information. Using stratified random sampling a sample of 33 secondary schools (2 national, 15 county and 16 private) was obtained. Purposively the principal and 3 science teachers were selected and randomly 6 form four students were sampled per school. This gave 330 respondents. Questionnaires were used to collect data from science teachers on their role in budgeting process as well as utilization and availability of instructional resources. Students provided information on utilization and availability of instructional resources by filling questionnaires. Principals were interviewed on school financial management policy in relation to budgeting and utilization of instructional resources. Data analysis was based on descriptive and inferential statistics using SSPS version 23. The study established that secondary schools in Nairobi have financial management policy and that teachers participate in budget planning, monitoring and control. Further it revealed that there is significant effect of stakeholders' participation (β=.254, p=.034) and budget planning process (β=.331, p=.019) on utilization of instructional resources in science instruction. School financial management policy (β=.016, p=.912) budget monitoring (β=.019, p=.894), and budget control (β=.009, p=.940) had no significant effect. The study recommends that the government should ensure that secondary schools have a financial management framework to guide budgeting for instructional resources. Further, science teachers need be involved in decision making in instructional management related process from strategic planning, budget planning, monitoring and control. Also, principals need to decentralize decision making through delegation to departments in effort to improve instructional management. Finally further research should also be done on the relationship between schools instructional management policy and learning outcomes in science.

CHATER ONE

INTRODUCTION

1.1 Background to the Study

Education as an essential part of Economic, Social and Cultural Rights (ESCRs) is perceived as legitimate to individual and collective good results into growth at national and global arena (Walter, 2009). Fulfilment of education as a right provides an all-round development of individuals who play effective roles in their immediate society and promotes political, social and economic development of country. According to Odhong' (2014) countries spend fortunes in education because they consider it the cornerstone of economic and social development. Through education, national productivity may be improved and poverty reduced as value and efficiency of the labour enhanced. Agreeing with this position, Mwaura (2010) noted that with advancement in technology taking place, new techniques of production require labour force which is well-trained and intellectually flexible.

Governments allocate resources for education which according to UNESCO (2005) ensures that educational programmes are implemented and goals achieved. In support of this argument, Lemelin (2005) suggested that educational activities like instruction require allocation of resources as a prerequisite in fulfilment of education as human right across societies. Further, UNESCO's global monitoring report on Education For All (EFA) (2005) noted that education is one of the largest sectors in most countries in terms of budgetary allocation. Funds allocated for education sector should influence utilization

of instructional resources in order to achieve desirable learning outcomes which are consistent to national educational goals.

UNESCO (2005) recommends that 26% of national budgets should be allocated to the education sector. This would ensure that countries expand educational infrastructure to enhance access to quality education for every child. In Kenya, allocation for educational processes has never reached the minimum 26% provided by UNESCO. For instance Table 1.1 shows budgetary allocation for education from 2010/2011 to 2015/2016 financial years. .

Table 1.1: Kenya Budgetary Allocations to Education Sector from 2010 to 2016.

Fiscal Year	Total National Budget (KES)	Education Sector Allocation (KES)	Percentage Allocation to Education
2010/2011	0.98 trillion	170 billion	17.3
2011/2012	1.156 trillion	200 billion	17.3
2012/2013	1.46trillion	273.3 billion	18.7
2013/2014	1.64 trillion	190 billion	11.6
2014/2015	1.77 trillion	308.6 billion	17.4
2015/2016	1.8 trillion	335.7 billion	18.7
Average	**1.467 trillion**	**246.27 billion**	**16.83**

Table 1.1 indicates that from 2010/2011 to 2015/2016 fiscal year, an average of 16.83% of national budget was allocated to education with the highest being KES: 335.7 billion (18.7%) in 2015/2016 financial year. KIPPRA (2014) asserts that education sector takes up second largest share of annual national spending. In analysing national budget allocations 2014/2015, KIPPRA (2014) noted half the amount allocated (50.92%) was allocated for teachers' salaries, while FDSE got 8.45%. Amount allocated for FDSE, was expected to finance instructional programmes in secondary education among other things

and needed to be planned and controlled to meet the set educational goals through a budgeting process at school level.

Earlier study by Kipchilat (2006) indicated that budgetary allocation to education sector has been increasing since independence. However it has not been established how these allocations have been utilized to enhance quality of education by ensuring instructional resources are adequately available. Provision of quality instructions and especially for science education is more valuable as far as national development is concerned. Science education is a pillar in development in any nation. Odhong' (2014) noted that science education is a precursor for technological and economic development in nation. According to Mukhwana (2013) sciences subjects namely biology, chemistry and physics equip learners with manipulative skills necessary for technological development and economic growth. This can be achieved through appropriate utilization of science instructional resources provided for through a budgetary allocation at secondary school level.

Hammond (2007) asserted that for quality of science education to be enhanced proper planning for instructional resources is essential. Planning for instructional resources demands that money be set aside and budgeted for to make them available and adequate in secondary schools. Supporting these sentiments Validya (2003) asserted that adequate budgetary allocation for instructional resources would ensure good learning outcomes for science subjects. Setting aside funds for instructional resources would only take place through budgeting process. However, good learning outcomes for Biology, Chemistry

and Physics would only be realized when budgeted instructional resources are effectively utilized in the classroom. In supporting this argument Njagi and Jagongo (2013) in case study on capital budgeting procedures and practices in public secondary schools in Meru North District asserted that effective utilization of instructional resources is key determinant of learning outcomes.

Kenya government recognizes the role played by Science Education in building human capital and innovations required for the transition to a knowledge driven economy, hence the need for adequate budgetary allocation for instructional resources. Vision 2030 proposes intensification of Science Education to raise productivity and efficiency levels across the three pillars of national development; namely economic, social and political (Amunga et al, 2011). Even though Science, Technology and Innovation Policy (2012) present Kenya government with an implementation framework which focusses on application of relevant scientific knowledge across sectors of the economy, there is no budgetary provision to put in place for its realization. Achieving transformational knowledge based economy as provided for in Kenya's Vision 2030, requires adequately budgeted for science instructional resources (Migosi, 2015).

Again transition to a knowledge driven economy is tying learning resources and achievements in science on performance in Kenya Certificate of Secondary Education (KCSE). A study conducted by Reche, Kareanki, Nthia and Kariuki (2012) revealed that performance in examination is used to benchmark for learning outcomes in Kenya. This approach has led to a scenario where learners concentrate on memorization of basic

concepts and cramming definitions (Sadiq, 2003). With adequate budgetary allocation for science instructional resources, reduced practical work could lead into inappropriate utilization of instructional resources in teaching and learning. Countering this would need budget monitoring strategies and control mechanisms to enhance utilization of science instructional resources.

Instructional resources are key in practical work which in turn enhances learners experience and understanding Science concepts, hence better learning achievement. This position is supported by Amadalo, Ocholla and Memba, (2012) who linked adequately availed and utilized instructional resources in teaching Sciences to better learning outcomes. To adequately avail Science instructional resources a policy driven budgeting process is essential. If appropriately structured aid in guiding the role of various stakeholders from planning through monitoring to control the allocated funds. A policy driven school budgeting process enhances utilization of science instructional resources needed in making learners gain necessary skills, which enables learners enjoy Science based disciplines (Oyoo, 2004). With such provisions in place, the desired productivity and efficiency levels in Vision 2030 across the three pillars of national development are likely to be realized.

This study linked learning achievements in science to utilization of instructional resources through budgeting process in secondary schools in Nairobi County. According to Kimeu, Tanui and Ronoh (2015) for secondary schools to improve on learning achievements in Science subjects it is necessary to have adequate instructional resources

for Biology, Chemistry and Physics. As much as other factors like teacher-student ratio need consideration, Wanjiku (2013) asserted that utilization of instructional resources improves learning outcomes and provides learners with what is needed for entry into Science based degree and diploma courses. Such skills are necessary in national development. Science teachers should therefore be encouraged to embrace and conform to the emerging technologies in pedagogy, which greatly depend on utilization of instructional resources (TIMSS, 2007).

Enhancing utilization of Science instructional resources require participation of teachers in budgeting process from planning, monitoring and control. This will ensure availability of funds for implementation throughout the year. Further, Kitheka (2005) asserted that schools with abundant resources may not always utilize them efficiently and consequently fail to raise student's learning achievements. Indeed schools with limited resources may utilize what they have efficiently and effectively to boost learning through adequate science teachers participation. When science teachers maximize utilization of available resources they adequately achieve instructional objectives. Summing up this Asayo (2009) asserted learning outcomes in science depends on budgetary allocation decisions to proper utilization instructional resources.

Nolan (2013) in an article on budgets and rights of the child suggested that national budgeting policies should provide the link to availability of instructional resources through budgetary allocation at school level. From national policy framework secondary school derive mechanisms to enable adequate budgetary allocation for instructional

resources for Science based subjects. This according to Okumbe (2007) would provide a framework secondary schools budgeting in terms of overseeing, directing, conducting, regulating and controlling science instructional resource management. Further Jebet and Naserian (2003) suggested a financial management framework that would provide secondary school leadership with basis for ensuring availability of adequate instructional resources to help learners conceptualize concepts in science subjects. In Kenya, a budgeting framework for guiding planning for educational goals is provided for in the Day Secondary Education (FDSE) policy.

According to FDSE policy of 2008, the government meets fees of Kshs. 10,265 per student in secondary school broken down as in Table 1.2

Table 1.2: Breakdown of Allocation of FSE in Vote Heads per Student

S/No.	Vote Head	Amount (Ksh)
1	Tuition	3,600
2	Repairs, Maintenance and Improvement	400
3	Local Travel and Transport	400
4	Administrative Costs	500
5	Electricity, Water and Conservancy	500
6	Activity	600
7	Personal Emolument	3,965
8	Medical	300
Total		**10,265**

Source: MOEST, Nairobi (2016)

Table 1.2 indicates that tuition is allocated Kshs: 3600, which is expected to finance instructional resources. At school level, adequacy and availability of instructional

resources should be determined by a financial management framework guiding the budgeting process. The school financial management policy would guide budgeting process through consideration of sources of income to meet overall cost of education programmes and how allocation is done to objectively achieve the educational goals (Okumbe 2001). While the provision of FDSE is commendable, there is no empirical evidence on how it influences instructional management. This study borrowed from assertion by Lemelin (2005) that for quality instruction proper planning through budgeting is essential.

Planning starts with the school budgeting process to determine budgetary allocations for instructional resources. Once budgeted for, instructional resources are made available for teachers to plan for utilization for the purpose of effective learning of Science subjects in the class. Systematically, budgeting process is guided by rules which should govern decision making leading into adequate budgetary allocation for Science instructional resources. Agreeing with these sentiments Roza, (2009) noted that a systematic process as budgeting process has rules governing formulation, approval and execution secondary schools budget. In practice, budgeting process is considered as a decision making process that uses information to allocate finite resources to prioritized institutional needs. For this reason, Purnamasari and Rahmawati (2014) suggested that for secondary schools to undertake budgeting, a policy framework defining information management connecting stakeholders and roles require structuring and adoption.

Kaguri, Njati, and Thiaine (2014) noted that the purpose of secondary school budgeting process is to systematically plan through formulation of objectives; identification of priorities; coordination of activities; enhancing accountability; controlling expenditure; and setting a base for performance evaluation. This confirms with Edmonds (2007) observation that a secondary school is a dynamic and complex environment requiring quality information management. Consequently, George (2005) asserts that quality information management provides reliable and timely data for budget planning; budget monitoring and budget control towards ensuring that instructional resources adequately made available. Ajuoga, Indoshi and Agak (2010) asserted that instructional resources when provided adequately and efficiently utilized are likely to lead to better Science learning outcomes. Empirical evidence was required to ascertain influence of instructional resources utilization on learning outcome.

Budget planning as a component of budgeting process assures adequate allocation for activities in a secondary school. Such include instructional resources for effective learning in science based disciplines (Murphy, 2002). It involves setting objectives, determining resources, soliciting requests, determining projections and cost to enhance effective management of secondary school resources (Lemelin 2005). For instance, in a case study of related factors affecting Nigerian secondary school academic performance, Banuso (2003) noted that improved economic forecasting and planning are important in ensuring appropriate budgetary allocation for instructional resources. However, Wanzare 2006) found out that in most cases appropriate budget planning for instructional resources is lacking in secondary schools in Kenya. This study sought to establish how

appropriately budget planning for science subject take place in secondary schools in Nairobi County.

A corresponding component of budgeting process is budget monitoring. This helps in setting the benchmarks for assessment of performance against allocation and progress of the budget in secondary schools (Walter, 2009). Budget monitoring would enhance utilization of instructional resources by ensuring adequacy and availability. Vital information is obtained from budget monitoring reports on spending patterns to help secondary school management in making realistic forecasts on instructional priorities are concerned. Gattiker (2007) agreed that quality information management is necessary to reduce inefficiencies and gaps in budget monitoring, but to what extent this can influence availability and utilization of instructional resources is yet in schools to be addressed. In this study the focus was on the effect of budget monitoring process on utilization of science instructional resources in secondary schools in Nairobi County, Kenya.

Hammond (2007) noted that school leadership requires a centralised database to consolidate financial data for ease of budget monitoring. In a paper on school inspection in Kenya, Wanzare (2006) noted that changes made by departments are rarely backed up or audited by the secondary schools management. A critical look on how such changes impact on sourcing for instructional resources is necessary to ensure adequate utilization. Furthermore, in a toolkit of American Association of School Administrators (2010) it is noted that budget monitoring is part of effective financial management in secondary schools and that this is necessary in keeping track of income and expenditure. The extent

of budget monitoring process in Kenyan secondary schools which involve science teachers is however yet to be established. However, this study examined the relationship between budget monitoring and utilization of instructional resources for learning Science in secondary schools in Nairobi County, Kenya.

Budget control is another component of budgeting process which would influence utilization of Science instructional resources in secondary schools. GP Consortia (2011) argued that budget control plays a key role in ensuring financial health of any secondary school. Ideally, effective budget control mechanisms would make learners gain necessary skills in sciences based disciplines. Further, George (2005) noted that budget control make leadership of secondary schools not only understand and follow limits of their authority to expend, but also allows changes in budgetary allocations that would easily affect instructional management. Budgetary control is not an end in itself sourcing for instructional resources, but rather a means of ensuring that value for money is achieved for effective learning in Science subjects. It enables secondary school management to identify the variance between expected and actual expenditures as instructional resources are concerned. According to Njagi and Jagongo (2013) however, elaborate budget control mechanism is lacking in Kenyan secondary schools. This could be a factor of secondary schools` leadership and this study focused on the roles Science teachers play in budget control for the purpose of enhancing utilization of instructional resources.

According to Kipng'etich and Ahmed (2007), lack of budget control leads to financial virement, described as a habit of transferring monies from one vote head to another,

depending on urgency. It was necessary to establish influence of virement on utilization of instructional resources in science learning requires empirical evidence. In many instances principals sign payment vouchers in some instances without checking or authentication (Kaggwa, 2003). Signing payment voucher without checking is a budget control mechanism issue that requires appropriate information. Gattiker (2007) portends that information management is necessary to serve the purposes of checking and authentication in secondary schools. It was prudent therefore to establish how the process of budget control relates to Science learning outcomes through appropriate utilization of instructional resources in secondary schools in Nairobi County, Kenya.

The Basic Education Act of 2013 put emphasis on quality instruction in Kenya through adequate funding (Republic of Kenya, 2013). However, as much as in Article 86 (2), the Act highlights the need of adequate funding of secondary education, it does not elaborate on budgetary allocation for science instructional resources. The Ministry of Education, Science and Technology (MOEST) through secondary school principals and subject teachers should ensure quality science instruction. In practice quality instruction depends on leadership and governance of secondary schools which has influence in science instructional management (Etindi 2001). As a component of secondary school leadership task, budgeting process is a key in overseeing, directing, conducting, regulating and controlling science instructional management. As suggested by Olembo, Wanga, and Karugu, (1992), effective secondary school leadership would ensure that principals, heads of departments (HODs) as well as Science teachers are involved in budgeting process for quality instruction management.

The extent to which all stakeholders participate in budgeting process for instructional resources in secondary schools in Kenya has not been adequately documented. Studies specify component in budgeting process and none on financial planning for Science instructional resources (Olembo, Wanga, & Karugu, 1992; Etindi 2001; Kaggwa 2003; Njagi & Jagongo 2013; Kipng'etich & Ahmed 2007; Wanzare 2006). While budgeting process is a sure way for success in any organization, more empirical evidence is needed on budget process in secondary schools and its relationship with utilization of instructional resources in Science learning in Nairobi County, Kenya.

1.2 Statement of the Problem

Effective teaching requires adequate and appropriate instructional resources, which can only be availed through planning (Jebet & Naserian, 2003). An essential part of instructional planning is budgeting for teaching and learning resources. Supporting this position, Uya (2004) noted that budgeting process would influence teaching and learning through adequate provision of instructional resources. This therefore means that to adequately utilize instructional resources, money needs to be set aside through budgeting process for their acquisition. What schools need in setting aside funds for instructional is putting in place a financial management policy which defines the role of stakeholders in budget planning, budget monitoring and budget control. Interaction of these elements of budgeting process would assure provision, availability and utilization of science instructional resources in secondary schools. Much work has been done on availability, adequacy and utilization of instructional resources and their influence on learning

outcome. However, there is limited information linking budgeting process and utilization of Science instructional resources.

The gap of knowledge that needs filling is on the link between budgeting process and utilization of instructional resources in secondary schools in Kenya. The influence of budgeting process on instructional management and the extent of involvement of Science teachers through school financial policy framework to utilization in the class has not been empirically highlighted. More specifically, no study has evaluated the effect of secondary school financial policy framework, stakeholder participation, budget planning, budget monitoring and budget control collectively in utilization of science instructional resources in Kenya. First there was a need to examine influence of school financial management policy as guideline for budgeting by providing a basis for availability of instructional resources; a framework for standardized procedures in sourcing and managing instructional resources; its role in outlining possible school funding sources for resourcing instructional management; and its role in providing accountability system that determines how available resources can be used for optimal learning achievements in Sciences.

Secondly, it was needful to determine the role of Science teachers as stakeholders in strategic planning to set milestones in instructional management; in departmental meetings to prioritize on appropriate instructional resources; in budgeting committee for adequate representation of Science instructional interests; and in both pre and post

budgeting consultations for trade-ins and adjustments to ensure adequate budgetary allocations for instructional resources.

Fourthly, it was vital to assess the role of Science teachers in budget monitoring through setting benchmarks, delineation of allocations, procurement management, and expenditure reports as well as budget reviews. Fifthly, it was necessary to determine the role of Science teachers in budget control mechanisms through requisition procedures, spending authorization, transaction records, payments confirmation, reconciliation of purchases, and auditing. In general, this study investigated the influence of policy framework and stakeholder involvement in budget planning, budget monitoring and budget control; and the extent to which they affects availability of instructional resources as well as how they utilization of instructional resources in Science subjects instruction in Kenyan secondary schools.

1.3 Purpose of the Study

The purpose of this study was to investigate the effects of budgeting process on utilization of Science instructional resources in secondary schools in Kenya.

1.4 Objectives of the study

The specific objectives of the study were:-

i. To examine the relationship between school financial management policy and utilization of instructional resources in Science instruction.
ii. To determine the effect of stakeholders participation in budgeting process on utilization of instructional resources in Science instruction.

iii. To establish the relationship between budget planning procedure and utilization of instructional resources in science instruction.

iv. To assess the effect of budget monitoring process on utilization of instructional resources in science instruction.

v. To determine the effect of budget control mechanisms on utilization of instructional resources in science instruction.

1.5 Research Hypothesis

Based on the specific objectives, the study sought to test the following research hypotheses

H01 There is no significant relationship between school financial management policy framework on budgeting process and utilization of instructional resources in science instruction.

H02 There is no significant relationship between stakeholders' participation in budgeting process and utilization of instructional resources in science instruction.

H03 There is no significant relationship between budget planning procedure and utilization of instructional resources in science instruction.

H04 There is no significant relationship between budget monitoring process and utilization of instructional resources in science instruction.

H05 There is no significant relationship between budget control mechanisms and utilization of instructional resources in science instruction.

1.6 Significance of the Study

This study may provide useful information to MOEST in formulation of policies on budgeting, planning and decision making that could facilitate provision of science instructional resources in secondary schools in Kenya. Secondly, the findings may be important to educational managers in budgeting for science instructional resources. Thirdly, to the education facilitators the findings from this study could be useful in appreciating their role in planning for science instructional resources.

1.7 Limitation of the Study

The limitation of this study was that as much as secondary schools in Kenya are considered to be managed the same way, obtaining information depended on the willingness and honesty of principals and the teachers on financial management practices in their schools. Some of them could be hesitant in giving information on budgeting processes especially on budget planning, budget monitoring and budget control.

1.8 Delimitation of the Study

This study was limited to financial management policy framework and stakeholder participation in budget planning, budget monitoring and budget control in planning for science instructional resources in secondary schools within Nairobi County.

1.9 Basic Assumptions of the Study

In this study the assumptions were that;

i. Budgetary allocation for instructional resources is determined during budgeting process.

ii. Respondents would understand purpose of the study and answer the questions appropriately.

iii. Schools do not depend entirely on Free Day Secondary Education (FDSE) fund for sourcing instructional resources and instead have several sources of finances.

1.10 Definitions of Key Terms

- **Budgeting Process:** a decision making process that uses information to allocate resources to prioritized school needs**.**
- **Instructional Resources:** These are material used in the classroom to facilitate teaching and learning process.
- **Learning Achievements:** grades scored by students in science subjects since the syllabus was reviewed in 2006.
- **Science Instructions:** teaching and learning of subjects set that include Chemistry, Physics and Biology.
- **Utilization of Instructional Resources**- The act of putting instructional resources into use during teaching and learning process.
- **Budget planning:** process that involves setting objectives, determining resources, soliciting requests, projections and cost analysis, that would be better managed with an effective information system.
- **Budget Monitoring:** setting the benchmarks to assess performance against allocations and progress against the budget.
- **Budgetary control:** executive responsibilities related to policy requirements for continuous comparison of actual with budgeted results.

- **Financial Management Policy** is a framework spelling out how secondary schools should control their funds or any asset. It has an outline for regulations and rules of handling assets and mechanism controlling of funds in secondary schools.
- **Stakeholder Participation** is an opportunity for those who play a role in instructional management to be involved in budgeting for teaching and learning resources.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter contains themes in the study. It begins with a discussion on financial policy framework and influence on budgeting guidelines, budgetary priorities, sources of resources and financial accountability. The chapter then explores stakeholders' participation in budgeting for instructional resources through strategic planning, departmental meetings, and budgeting committee and in both pre and post-budget consultations. Further, present budget planning for instructional resources through setting objectives, soliciting requests, prioritization, projections and ends with actual budgetary allocations.

In the chapter also is a discussion on budget monitoring in terms of setting benchmarks, delineation of allocations, procurement management, and expenditure reports and budget reviews. The chapter then presents a discussion on budget control mechanisms which include requisition procedures, spending authorization, transaction records, payment confirmation, and reconciliation of purchases. Last, the chapter contains a discussion on learners' achievement and theoretical framework of the study.

2.2 Policy Framework and Budgeting for Instructional Resource

Budgeting for instructional resources is an aspect of prudent financial management for science learning in secondary schools. Budgeting process in secondary schools is linked to effective and efficient use of resources towards realization of educational goals through quality instructions (Chetambve & Sakwa, 2013). In Kenya, national educational policy framework guides provision of instructional management through a number of legislations and policy paper whose provisions are derived from international legal instruments (Chaudhury et al, 2006). Realization of quality science instructions in secondary schools is therefore dependent on national educational policy framework.

Nolan (2013) in an article on Economic and Social Rights, Budgets and the Convention on the Rights of the Child argued that when schools are developing the financial management policy, they should consider the role of education in national development. This would influence schools' budgetary allocation for Science instructional resources. This study considered budgeting for instructional resources as a running and dynamic process typically marked by regular phases outlaid in specific secondary school financial management policy. These define what needs to be done from setting objectives, allocation of funds, monitoring expenditure and control mechanisms to ensure appropriate science instructions take place. From England, Du Preez, Grobler, Lock and Shaba (2003) in module on Managing School Finances which is part of Effective Education Management Series asserted that secondary schools need specific institutional financial management policy to enable them organize and manage available funds for quality instructions.

Bisschoff and Mestry (2003) in a study conducted in South Africa on school financial management suggested that for secondary schools to fairly allocate limited resources to several and demanding need. Budgeting process when guided by an institutional specific financial management policy arrives at a balanced budget to address competing demands within a secondary school. However, Du Preez, Grobler, Lock and Shaba (2003) suggested more work on secondary schools financial management policies and budgeting for instructional resources. Ideally, secondary schools financial management policy should take into considerations national educational policy and legal framework, population of students, infrastructure and staffing to enable the institution to achieve its educational goals. Secondly, school financial management policy should consider quality science instruction as a pre-requisite towards realization of educational goals in all nations worldwide.

Kenya government recognizes the role played by science in wealth creation, building human capital and innovations required for the transition to much desired knowledge driven economy (Onsomu, 2014). It is expected that financial policy framework from national level would bring uniformity in instructional management in schools in any country and specifically in Kenya. Supporting this position, Asiabaka (2008) from Nigeria confirmed that management disparities exist in provision of instructional resources and utilization in secondary schools across Sub-Saharan Africa. Ideally, leadership styles determine institutional approach in managing finances would result in disparities in instructional management, despite the fact that education philosophy

emphasis is on quality Science instructions in secondary schools. Asiabaka (2008) in a study on effective management of schools in Nigeria noted government's failure to have a policy framework on standards in budgetary allocations for instructional resources.

Robinson, Lloyd and Rowe (2008) linked secondary schools principals' leadership styles to instruction in general, but this study looked at the influence of budgeting process on utilization of science instructional resources. This study built on work done by others scholars on leadership of secondary schools and narrow down to its influence on utilization of Science instructional resources through institutional financial management approach. Leadership influence on school financial management has a direct influence on budgetary allocations for Science instructional resources and indirectly on their utilization in class. Robinson, Lloyd and Rowe (2008) studied relationship between school leadership and instructional management in New Zealand and employing a meta-analysis and found out that the average effect of transactional leadership on learning achievements was three to four times that of transformational leadership. Leadership is critical in formulation of specific secondary school financial management policy which in turn influences budgetary allocation for Science instructional resources. Effective learning in Science is dependent on availability and utilization instructional resources, which in turn are influenced by school budgeting process.

According to Okumbe (2007) quality instructions is achieved when adequate instructional resources are availed through budgetary allocation. Influence of leadership on Science instruction can only be traced through school financial policy guiding decisions on

budgetary allocations. Findings by Robinson, Lloyd and Rowe (2008) did not consider of specific effect of budgetary allocations on utilization of science instructional resources in secondary schools. Instead Robinson, Lloyd and Rowe (2008) relied on five sets of leadership dimensions as actors that would influence learning in schools. These are formulation of establishing goals and definition of expectations; resourcing strategic resourcing; planning, coordinating, and evaluating instructional process; promoting teacher learning and development, and ensuring an orderly and supportive environment.

Financial policy framework is intended to provide school leadership with a basis for ensuring adequate instructional resources for learning science subjects. This study sought to establish through a correlation design the influence of school financial management policy on budgeting process. Institutional financial management policy guides the role of science teachers in budgeting through budget planning, budget monitoring and budget control. This is in agreement with Du Preez et al (2003) who established that school financial policy is important for instructional leadership since it aids determination of budgetary allocations for teaching and learning resources. With adequate budgetary allocation coupled with appropriate budget monitoring and control mechanisms, better utilization of resources should be expected during Science instructions.

In Sub-Saharan Africa Ministries of Education provides policy guidelines on financial management for secondary schools. National guidelines on school financial management guidelines are expected to be domesticated at institutional level to streamline instructional management towards realization of country education goals. According to

Motsamai, Jacobs and Corene (2011), despite the efforts of Lesotho government to enhance principals' performance and guidelines for financial management capacity does not exist in secondary schools to actualize this dream. This implementation capacity gap can be attributed to leadership style and failure to domesticate national policies regulations and guidelines at institutional level. Findings of Motsamai et al (2011) and Robinson et al (2008) confirms variation in instructional leadership approaches in secondary schools. Ideally as suggested by Nolan (2013) when developing financial management policy, school leadership should consider national guideline to effectively influence budgetary allocation for instructional resources for science learning.

Science instructional management is the responsibility of MOEST in Kenya and is guided by policies for implementation through school principals and subject teachers for Biology, Chemistry and Physics. Kenya national policy and legal framework is made up of Sessional Paper No. 1 of 2005 on Education, Training and Research; Free Day Secondary Education Policy of 2008; **S**essional Paper No. 1 of 2005 on Education, Training and Research; Constitution of Kenya (2010); Kenya Vision 2030; Sessional Paper No14 of 2012; Basic Education Act of 2015; Teachers Service Commission (TSC) Act 2012; Public Finance Management Act 2012; Science, Technology and Innovation (ST&I) Policy of 2012; and Public Procurement and Asset Disposal Act 2015. These policies are guided by international legislation which considers quality Science instruction as fulfilment of education as right (Chaudhury et al, 2006).

From international instrument to school financial management policy, a framework for budgeting process is envisaged for setting goals, defining expectations; strategic resourcing ; planning, coordinating, and evaluating science instructions; promoting teacher learning and development, and ensuring an a supportive instructional environment (Robinson et al, 2008). To establish this, it was necessary to investigate the effects of budgeting process on utilization of science instructional resources in secondary schools in Kenya.

The basis of quality Science instruction is set by Constitution of Kenya (2010) and Vision 2030. Specifically, articles 43.1f, 53.1b and 55a of Constitution of Kenya (2010) domesticate education as a human right. Secondly, Vision 2030 stresses that science education is vital in ensuring relevant human resource for sustainable development in Kenya. Further, Constitution of Kenya (2010) guarantees free and compulsory quality basic education for all children. Also, International Convention of Economic, Social and Cultural Rights (ICESCRs) in Article 13(2b) emphasises accessibility of secondary education to all through every appropriate means with necessary resources provided. All these can only become a reality if secondary schools financial management policy provides a basis for adequate budgetary allocations for science instructional resources.

The level of utilization of science instructional resources in secondary schools varies due to different approaches in financial leadership. In a study examining level of attainment of Kenya vision 2030s' education policy flagship targets in public secondary schools in Nakuru District, Lawrence and Orodho (2014) established that a variation exists in provision of instructional resources. This was in tandem with findings of Motsamai et al

(2011) and Robinson et al (2008) that there is variation in financial leadership approaches in secondary schools, which influence budgetary allocation for Science instructional resources. Variation in leadership is uniquely a factor on school specific financial management approach and specifically a factor on effect of budgeting process on utilization of Science instructional resources. This study hypothesized no significant relationship between school financial management policy framework on budgeting process and utilization of instructional resources in Science instruction.

Kenya government gives learners in public secondary schools under FDSE policy Kshs. 3600 for instructional resources (Obunya, 2008). However, there is no guarantee that this amount is used for instructional resources in secondary schools. As noted by Etindi (2001) setting aside funds of instructional resources is guided by schools' financial leadership approach and each school has a mechanism of reaching decision budgetary allocations. This skewedness necessitated the need to investigate existence of financial management policies and influence on utilization of instructional resources. In this study school financial policy framework was looked at by considering its existence and influence on budgeting guidelines, budgetary priorities, sources of resources and financial accountability

2.2.1 Budgeting Guidelines and Utilization of Science Instructional Resources

Budgeting guidelines are basic provisions of what to be included in a budget for effective resource allocation. Institutional financial management policy provides for economic planning and utilization of school funds for realization of educational goals. In Nigeria,

Asiabaka (2008) noted the government's failure to put in place a policy framework on minimum standards in relation to schools facilities which resulted in disparities in acquisition science instructional resources. Likewise in Lesotho, Motsamai et al (2011) noted a discrepancy between national policy and financial management approach in secondary schools. In South Africa Joubert and Bray (2007) in an article on public schools governance suggested that institutional financial policy should ensure accountability and prudence in instructional management. In Kenya, Wagithunu et al (2014) acknowledged existence of guidelines on the vote heads and allocation of funds in secondary schools. However, the extent to which these guidelines influence utilization of instructional resources in learning Sciences had not been explored.

Secondary schools financial management policy links budgeting process to instructional leadership. This linkage would be through guiding budgeting as a framework for overseeing, directing, conducting, regulating and controlling in instructional management in schools. Budgeting guidelines as noted by Ankomah (2005) are intended to provide school leadership with a basis for ensuring availability of adequate instructional resources. Therefore, it was necessary to establish existence of school financial management policy in secondary school in influencing budgetary allocation for instructional resources. Further, it was necessary to establish if secondary schools in Nairobi County have financial policies with objectives that inform budgetary allocations for the instructional resources for science subjects.

2.2.2 Sources of Funds and Utilization of Science Instructional Resources

Secondary education in Kenya is financed through different funds sources, depending on category of institutions. According to Otieno and Colclough (2009), public secondary schools are mainly financed by the government through parliamentary approval each year and school fees paid by parents. Apart from paying teachers in public schools the government through FDSE policy meets fees of Kshs. 10,265 per student in secondary school (Obunya, 2008). Out of Kshs. 10,265 paid by government per student Kshs: 3600 is for tuition and should cater for science instructional resources. Schools can also finance budgetary allocations for instructional resources from fees paid by parents, funds from income generating projects, contributions or donations by private sources and special grants from government (KIPPRA, 2007).

Lawrence and Orodho (2014) established that among secondary schools in Nakuru district there was weakening effect where less was allocated for teaching and learning resources. This is an indication that some schools are well equipped influences learning outcomes in sciences. Lawrence and Orodho (2014) study also suggest that some schools mobilize resources to supplement government funding and fees to boost instructional resources demands. Supporting this position, Obunya (2008) asserted that increased enrollment in secondary schools requires increased mobilization of resources to supplement government funding and fees paid by parents to raise adequate instructional resources. This study sought from Science teachers if all expected resources including fees, grants and subsidies are considered in budgetary allocation for Science instructional resources secondary schools in Nairobi County.

2.2.3 Standardized Procedures and Utilization of Science Instructional Resources

The mandate of the education sub sector in national development is derived from chapter four of Constitution of Kenya. Specifically, Articles 43, 53, 54, 55, 56, 57, and 59 include provisions on quality education to the extent compatible with the demands of the Kenya Vision 2030. Constitution of Kenya (2010) sets out general guidelines on the management of public resources as provided by various legislations and policy documents (Republic of Kenya 2010). These constitutional provisions are translated into financial management policies to enable institutions and their staff to concentrate their scarce time on instructional priorities. School financial management policy should therefore provide standardized procedures in managing institutional resources.

Standardized procedures are essential in making informed use of resources, demonstrating value for money and enhancing use of Science instructional resources. This exercise involves proper controls over public money and allocation of resources effectively to meet priorities for realization of educational goals. However according to Oplatka (2004) principals in developing countries have unique challenges arising from autocratic approach to leadership skewing allocation of resources, limited change management initiatives and lack of instructional management functions. There was need to establish existence of standardized procedures in secondary schools in Nairobi County, Kenya. This study sought from science teachers whether management procedures for sourcing Science instructional resources are standardized according to laid down procedures in secondary schools in Nairobi County.

2.2.4 Financial Accountability and Utilization of Science Instructional Resources

Accountability includes financial reporting; accounting, procurement and physical controls; performance measurement and internal audit. School financial management policy should provide a control system to guide the use of available resources optimally for effective instructional management to produce quality learning outcomes. According to Chetambve and Sakwa (2013) schools' financial management policies should not only ensure that resources adds value towards achieving learning outcomes, but also reinforce transparency from budgetary allocation to auditing. However, having accountability provisions in schools is vital a step towards achieving instructional goals and specifically utilization of teaching and learning resources in secondary schools.

A study conducted in South Africa by Mestry (2006) reported that teachers have differing perceptions about accountability measures in managing funds for the purposes of making instructional resources adequate for teaching and learning process. Locally, this position was also held in a report by Transparency International (2010) in the educational sector integrity where it was noted that teachers are rarely in the picture of financial accountability practices in individual schools. This is despite of the provisions of Public Finance Management Act 2012 (Republic of Kenya, 2012) and related legislations emphasizing participation. These legislations were enacted to ensure prudent management of public resources pursuant to provisions of Chapter 12 of the Constitution of Kenya (2010). This study sought from science teachers and secondary principals if institutional financial management policy had provisions for accountability in sourcing of instructional resources in secondary schools in Nairobi county Kenya.

Oplatka (2004) linked leadership styles of secondary school principals to instructional management and learning outcomes. However, they did not acknowledge influence of school financial management policy on budgetary allocation for Science instructional resources in secondary schools. This study established from the reviewed literature the need to examine how budgetary allocations for science instructional resources influence their utilization at class level in Nairobi County, Kenya. This was informed by the fact that Mestry (2006) linked utilization of instructional resources to budgeting process in secondary schools. Therefore, it hypothesized that school financial management policy should guarantee appropriate budgetary allocation for science instructional resources.

2.3 Stakeholders Participation and Budgeting for Instructional Resources

Secondary school specific financial policy framework highlights role of stakeholders at different stages in budgeting process. Secondly, institutional policy framework explains relationships, responsibilities and communications channels in secondary schools budgeting process. Agreeing with this position, Bisschoff and Mestry (2003) noted that budgeting process involves relationships and communication with all stakeholders within the school community including non-teaching staff. Budgeting process is highly a technical process and participation of lay people could include identifying priorities and monitoring progress made. In ensuring proper utilization of instructional resources, Okumbe (2007) suggested that secondary school principals need to work in collaboration with Board of Management (BOM), parents, teacher, and support staff because they all have roles in budgeting process.

Enlisting cooperation of stakeholders is vital in providing a broader picture of secondary school budget. Secondly, as noted by Anderson (2008) it creates a feeling of partnership among stakeholders which contributes to the much needed quality education through effective instructions. Budgeting for Science instructional resources is an aspect of educational planning which requires participation of stakeholders with specific knowledge. Technically, principals, HODs as well as the teachers need to be involved in the budgeting process for the purpose of promoting quality science instruction and learning outcomes. This study considered Science teachers as key stakeholders required to fully participate in budgeting process for instructional resources for their respective subjects in secondary schools in Nairobi County, Kenya.

In a study on effectiveness of secondary schools principals in United Kingdom, Jason, Grissom and Loeb (2009) argued that principals as managers should have support of colleagues and education stakeholders decision making regarding budgetary allocation for instructional resources. For effective science instructional management, principals need support for respective subject teachers in school budgeting process to ensure adequate budgetary allocation for teaching and learning resources. Echoing Grissom, and Loeb (2009) on the need for collaboration with science teachers. Anderson (2008) argued that budgeting for instructional resources as part of school financial management provides the most visible ways through which stakeholders would judge the performance of principals. Further, this will ensure adequate budgetary allocation for Science

instructional resources to make them available for effective utilization for learning in secondary school.

Jason, Grissom and Loeb (2009) established that secondary school principals' management skills have an influence not only on learning achievement, but also learners' growth. This finding resonates with Robinson et al (2008) description of leadership dimensions requiring organization management skills pivotal in budgeting for instructional resources. Ideally, during budgeting for instructional resources organizational management skills are needed in setting objectives, consideration and allocation of available resources, monitoring and control of expenditures to create productive learning environment. This study explored application of organizational management skills in secondary schools in provision and utilization of instructional resources through budgeting process.

De Grauwe, Anton and Candy Lugaz (2011) in an article on decentralizing Education in Kenya, Uganda, and Lesotho jointly published by International Institute for Educational Planning and UNESCO considered stakeholder participation in budgeting process a vital in instructional management. It was necessary to establish the relationship between Science teachers' participation in budgeting process and learning outcomes in Biology, Chemistry and Physics in secondary schools in Nairobi County, Kenya. Naidoo (2005) asserts that participation of teachers in the day-to-day financial aspects of instructional management raises attainment of good learning outcomes in sciences. Secondly, it was expected to provide empirical evidence in support of secondary schools principals'

organization management skills as proposed by Jason et al (2009) and Robinson et al (2008) in promoting learning in sciences.

Leithwood and Jantzi (2008) carried out a study in United States of America aimed at linking school leadership and learning outcomes and established that collective efficacy had a strong and a positive relationship with utilization of instructional resources. This was congruence with findings of Jason et al (2009) in United Kingdom and Robinson et al (2008) in New Zealand that leadership dimensions predicts effectiveness of learning sciences. This is further supported by De Grauwe et al (2011) consideration that stakeholder participation in the budgeting process is a vital decision-making process in instructional management. So far the reviewed literature has underscored the pivotal role of science teachers' participation in secondary school budgeting process. This study focussed to establish the extent to which Science teachers' participates budgeting process in secondary schools in Nairobi County, Kenya.

Nagy (2011) in a study on inclusion of teachers in decision-making and learning achievements in Dubai related what goes on the corporate world to the educational landscape. Nagy (2011) postulated that input of valued employees greatly benefits the corporate organizations and educational landscape from unilateral decision making to inclusive leadership that allows teachers` participation. This would enable secondary schools to realize instructional goals through science teachers' involvement in budgetary decisions on resource allocations. In agreeing with this position, Vegas (2007) suggested that involvement of teachers in budgeting process leads to efficient and effective

utilization of instructional resources. Therefore, it was necessary to establish the role of Science teachers in budgetary allocation decision for instructional resources.

Nagy (2011) compared two principals' management styles and learners' achievements and presented a clear picture of inclusive decision making that involve teachers' input in science instruction. This study took Nagy (2011) beyond two principals and interviewed 29 from public and private secondary schools in Nairobi County, Kenya. Also in the sample were 89 Science teachers and 172 form four students who filled questionnaires. Data obtained was in quantitative form and was analyzed through creation of simple tables showing frequency of occurrence. Secondly, Nagy (2011) involved establishing statistical relationships between variables and modeling of both categorical and quantifiable data to link school leadership to utilization of Science instructional resources through budgetary decisions.

Kumbi (2015) in a study on participation of teachers in school decision making in Arsi Zone, Ethiopia, revealed that their level of participation in decision making was not upto the needed standards. In Arsi Zone in Ethiopia according to Kumbi (2015) teachers participated mostly in issues related to curriculum and instruction, and participated least in budget and income generation. The study by Kumbi (2015) did not link instructional management and financial leadership in secondary schools in terms of participation of Science teachers in budgetary decisions. The need to investigate participation of Science teachers in budgetary decisions in line with suggestion of Davies (2004) in an article on strategic approach to finance and budgeting that secondary school principals should

appreciate role of Science in instructional management through budgeting process to enhance utilization of teaching and learning resources.

Sharp and Walker (2005) in an article on the role of principals as school managers argued that some consider teachers to be less knowledgeable on financial management issues. However much differences in leadership styles and principal perceptions, Sharp and Walker (2005) argument could be the reason behind the findings of Kumbi (2015), Leithwood and Jantzi (2008), Jason et al (2009), Robinson et al (2008), De Grauwe et al (2011) and Nagy (2011). There is a need to link financial leadership and instructional management in secondary schools. This study explored this link by investigating the relationship between Science teachers' participation in financial management decision making and utilization of instructional resources

The findings by Kumbi (2015) resonates with studies carried out in Kenya. Kuria (2009) investigated the extent teachers are involved in decision making and revealed that principals allow very minimal participation by staff in budgeting process and financial management in general. Gichohi (2015) in a study to establish the relationship between stakeholder involvement and utilization of instructional resources found out that most schools leadership embraced teachers' participation in general school management, but rarely on financial decision making process. Kipkoech and Chesire (2011) in a study to establish teachers' involvement in managerial decision making, indicated that their involvement is only at lower levels of management. These findings are indications that secondary schools leadership is yet to fully appreciate the role of Science teacher on

decisions towards budgetary allocations for instructional resources. This prompted this study to investigate how this would influence utilization of Science instructional resources in secondary schools in Nairobi County.

Science teachers' involvement school decision-making processes could have a positive significance on learning achievements in Biology, Chemistry and Physics. However, from a number of studies there is a strong indication that Science teachers are rarely involved in budgetary decision on instructional resources. The fact that secondary school principals rarely involve Science teachers in budgeting process for instructional resources was noted by Kipkoech and Chesire (2011), Davies (2004), Kumbi (2015), Kuria (2009) and Gichohi (2015). As noted by Sharp and Walker (2005) the explanation for no involvement is perception of secondary school principals that Science teachers are less knowledgeable on financial management issues. This prompted the necessity to investigate the significance of Science teachers' participation in secondary schools budgeting process and utilization of instructional resources.

As much as secondary school principals could have the excuse that Science teachers are less knowledgeable on financial management issues, Ajuoga, Indoshi and Agak (2010) argued that Science teachers can effectively participate in budgeting process when financial language used is simplified. Further, Hoy and Miskel (2008) asserted that budgeting in secondary schools is too complex to be performed by a single individual. The requisite knowledge and skills are collaboratively found among the staff. Supporting this position, Olembo, Wanga and Karugu (1992), suggested that principals, heads of

departments (HODs) as well as the teachers need to be involved in the budgeting process for the purpose of promoting quality instruction and learning outcomes. This prompted the need to investigate the role of Science teachers in budgetary allocation decision for instructional resources.

Kumbi's (2015) study in Arsi Zone in Ethiopia was a descriptive survey involving teachers, HODs, unit leaders, principals, PTAs, and 9 secondary schools supervisors as respondents. He used a mixture of sampling techniques to draw a study sample. Teachers were selected through simple random sampling technique whereas principals, department heads, unit leaders, supervisors by availability sampling techniques and PTAs' chairpersons were selected by purposive sampling techniques. For this study the target population was made up of principals, head of Science departments and form four students in secondary schools in Nairobi County. To obtain the sample, this study employed stratified random, simple random and purposive sampling technique. To ensure each category of schools were represented in the sample, stratified random sampling was used.

A similar study conducted in Kenya by Kuria (2009) randomly selected teachers, bursars and BOM members and principals came up with a sample to study degree of stakeholders' involvement in budgeting process in secondary schools in Thika District, Kenya. Kipkoech and Chesire (2011) employed a cross-sectional survey with a sample made up of principals, deputy principals, head of departments and class teachers. Stratified random and purposive sampling techniques were used to draw a sample for this

study from target population made up principals, science teachers and form four students. In this study questionnaires and interview schedules were used for data collection similar to Kipkoech and Chesire's (2011) studies. Quantitative data was analyzed through establishing statistical relationships between variables and modeling of both categorical and quantifiable data.

Reviewed literature revealed that Science teacher involvement in budgeting process could ensure adequate budgetary allocation for instructional resources. First Naidoo (2005) noted that several scholars have argued that participation of teachers in the day-to-day financial management is key towards attainment of instructional goals through planning, monitoring and control in budgeting process. In some Asian countries, like Malaysia, school financial management has improved because it involves teachers in decision-making (Luck, 2011). In South Africa the teachers' participation in decision-making has played a role in the improved and expanded school-based management (Naidoo, 2005). However, the link between financial leadership and instructional management through involvement of science teachers in budgeting process has not been adequately studied. Thus it was hypothesized that the involvement of Science teachers in the budgeting process in secondary schools has significantly influenced budgetary allocation for instructional resources.

2.3.1 Strategic Planning and Utilization of Science Instructional Resources

A strategic planning exercise builds on people's creativity and collective consensus, respecting people's priorities and choices. According to Mulwa (2005), strategic plan

should have milestones clearly indicating what each set of actions are expected to lead. In secondary schools, strategic plans' milestones in instructional management would include as sourcing and making resources available for effective Science instructions. However, according to Mbugua and Rarieya (2014) secondary schools in Kenya have not fully embraced strategic planning. This study targeted secondary school Science teachers and principals to establish availability of strategic plans in their institutions and whether those in plans qualify Science instructions through appropriate utilization of instructional resources as one of the milestones.

Wanjala and Rarieya (2014) in an article on possibilities and challenges on strategic planning in schools in Kenya, revealed that limited knowledge and awareness reduce its effectiveness as an instructional management tool. Further, Wanjala and Rarieya (2014) found out that stakeholders in strategic planning process are involved in different ways. In their study Onguko, Abdalla and Webber (2008), noted that some schools do not engage staff in the strategic planning process, instead hire consultants to make it or simply borrowing and adopting from other schools. However, this study hypothesized that secondary schools have variations in their contextual needs, which requires each to have its uniquely developed strategic plan. Further, this study the focused was the extent to which Science teachers take part in school strategic planning where objectives informing budgetary allocations for instructional resources are set.

2.3.2 Departmental Meetings and Utilization of Science Instructional Resources

One way in which Science teachers can participate in school budgeting process is through departmental meetings. According Wadesango (2012), departmental meetings provide a participative decision making platform and contributor toward successful instructional management. Ideally, science teachers have a role in decisions that lead to budgetary allocations for instructional resources during departmental meetings. Agreeing with this position Witty (2003) asserted that departments have a role to ensure quality instructions and overall sailing in the academic spheres. At the departmental meetings science teachers would prioritize on quality and quantity of instructional resources necessary for effective instructions aimed at good learning outcome. This study therefore investigated the role of science teachers in decisions leading to budgetary allocations for instructional resources.

Mathu (2013) in a study of perceptions of teachers and principals on the role of Head of Department in Secondary School in Kiambu County noted that departmental meetings provide a platform for cooperative planning to identify instructional needs for Science instructional resources. During such meetings, departmental budgets should be drawn after deliberations based on subject requirements per class and forward such to the school budgeting committee. However, as noted by Oplatka (2004) autocratic leadership style common in most secondary schools characterized by lack of collaborative approach in instructional management would reduce budgetary decision role of departmental meeting. Therefore, it was vital to establish the level of participation of Science teachers in budgeting process through departmental meetings.

2.3.3 Budgeting Committee and Utilization of Science Instructional Resources

In budgeting committees, head of Science or a representative teacher and those from other departments receives departmental priorities which are then brought together to facilitate drawing of the final school budget. Mokoena (2011) suggested that science teachers and other stakeholders need to be given opportunity to play legitimate roles in school budgeting process. This study explored possibility of secondary schools in Nairobi County having budgeting committees with Science teachers represented purposely for appropriate budgetary allocations for instructional resources. This was partly informed by Hussien (2015) findings on teachers' role in decision-making in managing secondary schools in Ethiopia, where it was indicated that committees existing were only concerned with curriculum and instruction.

Secondary schools leadership need to establish a budgeting committee with representation from science department as a step towards linking financial leadership to instructional management. However, principals' perception of teachers' ability and the role they could play in instructional management. Confirming this Sharp and Walker (2005) asserted that secondary school principals consider teachers to be less knowledgeable on financial management issues. Several reasons including minimal trust, lack of budgeting knowledge and absence of motivation of teachers could explain this apparent lack of participatory leadership. However in this study, the concern was on representation of Science teachers in budgeting committees as a determinant of budgetary allocation for instructional resources.

2.3.4 Budgetary Consultations and Utilization of Science Instructional Resources

Consultations between budgeting committees and Science teachers before and after the school budget drawn would affect overall instructional management. Pre-budget consultation is one way of ensuring that the school budget effectively address issues to do with instructional resources. Echoing this position Drah (2011) in a study on teachers' participation in decision making process in senior high and technical schools in the Kwaebibirem district in the eastern region of Ghana, recommended that there should be pre-budget consultations between budgeting committees, Science department and individual subject teacher for effective instructional management. This study sought to establish existence of pre-budget consultations on budgetary priorities in regard to Science instructional resources in secondary schools in Nairobi County.

Post–budget consultation enables adjustments for adequate allocation for instructional resources for sciences by appropriating given amount for instructional resources before adoption of the budget. This position is also held in a presentation by Kosgei and Kimengi (2007) during Kenya Association of Educational Administration and Management, (KAEAM) Conference on effectiveness of HODs in school budgeting process. However, they also recommended that after budgetary allocations have been made by the budgeting committee recognition of expertise of Science teachers in their respective subject and teaching methodology through post budget consultations would be vital. Kosgei and Kimengi (2007) surveyed selected districts in North Rift, but this study focussed on secondary schools of Nairobi, county.

2.4 Budget Planning and Utilization of Science Instructional Resources

Budgeting process involves setting objectives, determining resources, soliciting requests, determining projections and cost to enhance effective management of school resources, (Kruger 2005). A school budgeting process starts with a planning phase and results into a mission statement expressed in monetary terms. Budget planning phase should result in a statement of intentions geared towards realisation of instructional goals through resources allocation. In support of this position, Cole and Kelly (2011) noted that planning in school budgeting process involves formalization of objectives and then arranging for provision of resources in order to achieve desired instructional outcomes. For desired learning outcomes, the product of budget planning should be a statement of desired activities expressed in financial terms in pursuit of instructional goal over a period of one year.

Effective utilization of science instructional resources requires adequate budgetary allocations through budgeting process. Kung, Huang and Cheng (2015) in a study on budget planning models in China concluded that budget planning influence organizational management performance. In secondary schools, budget planning should influence instructional management through budgetary allocation for teaching and learning resources. Measures of performance in Science instructional management are learning outcomes and would depend on how appropriately resources are planned for through a budgeting process. As noted by Du Preez et al (2003), in education management series the best strategy to improve utilization of Science instructional resources is to involve teachers in decision making during budgeting process.

Secondary school leaderships employ budget planning strategies with hopes of realizing effective utilization of teaching and learning resources. These strategies according to Kung, Huang and Cheng (2015) are mediators which are positively influenced by budget planning approaches. In secondary schools, a collaborative approach involving various stakeholders and linking financial leadership with instructional management. Further, Kung, Huang and Cheng (2015) asserted that stakeholders' involvement is a consideration in designing budget planning strategies and would have positive significance on utilization of science instructional resources. In investigating the influence of budget planning in utilization of instructional resources, this study considered science teachers as key stakeholders in secondary schools budgetary decision making process.

Using questionnaires and statistical equation modeling, this study, like that of Kung, Huang and Cheng (2015) derived conclusion on relationship between the stakeholders participation in budget planning on management outcomes. Science teachers as suggested by Cole and Kelly (2011) are responsible for budget implementation in instructional management and this study hypothesized that participation of Science teachers in budget planning had a significant influence on learning outcomes. To arrive at the conclusion, Science teachers and students provided information by filling questionnaires which was analysed to explain the correlation between budget planning and utilization of instructional resources. The design used was quantitative approach and yielded

numerical and quantifiable data, which was used to generate frequency distributions and percentages from the school and personal background information.

Reviewed literature has so far indicated that science learning achievements in secondary schools is influenced by strategic budgetary allocation for instructional resources. In support of this position, Luck (2011) asserted that budgetary allocation for instructional resources remains a critical element in science learning outcomes. Adequate budgetary allocation for instructional resources would affect appropriate utilization for better learners' achievements in sciences. From United Kingdom, Mascitti-Miller (2012) examined practices in budgetary allocation in elementary schools and found out that the principals discretionally allocated resources to create a high performing school. This disregards an emerging view from reviewed literature that participation of stakeholders in budget planning has a significance correlation with learning outcomes through effective utilization of instructional resources.

Mascitti-Miller (2012) targeted eight schools and used a matched sampling methodology to provide an analysis on the relation between resource allocation and class instruction in United Kingdom. This study used a sample from public and private schools in Nairobi County obtained using purposive, stratified and simple random sampling techniques with emphasis on participatory approach in instructional management decision making. From selected schools, the principal and three Science teachers were purposely sampled. Purposive sampling was used to select principals, Science teachers and form four students selecting since they were likely to be knowledgeable and informative about

either budgeting process or utilization of instructional resources. From each school 6 form four students were randomly selected from all the streams to make up the sample. Care was taken to ensure that each stream was equally represented into the sample.

Instructional needs for Science subjects are better identified by teachers through the department and forwarded to budgeting committee as part of budget planning in secondary schools. According to Mascitti-Miller (2012), principals should be flexible in their approach in spending to strategically meet instructional needs of their schools. However, this study focused on a consultative approach in budget planning in secondary schools. Lemelin (2005) suggested that of Science teachers need to participate in setting objectives, resources identification, soliciting requests, determining projections cost in budget planning. In acknowledging different positions of Mascitti-Miller (2012) and Lemelin (2005), this study appreciated the fact that budget planning is a dynamic process typically marked by regular phases that requires consultative approach in formulation of objectives, needs assessment and priority setting.

2.4.1 Budget Objectives and Utilization of Science Instructional Resources

Every educational institution ought to have strategic directions regarding instructional management. Strategic direction on instructional management informs setting of budget objectives in line with schools educational goal. Echoing this position, Mulwa (2005) asserted that strategic direction for instructional management is a milestone with clear each set of actions on budgetary allocation, sourcing and utilization of teaching and learning resources. Key action plan in instructional management as a milestone is

budgetary allocations for teaching and learning resources that would determine their availability and adequacy. Adequate allocation of funds for instructional resources during budget planning starts with setting objectives which links resource management to class instructions.

Moswela (2009) in a study on secondary school development plan in Botswana as an instructional management strategy concluded that budget planning should be informed by curriculum objectives. Borrowing from Moswela (2009), the argument in this study is that curriculum objectives are synonymous with instructional goals in secondary schools strategic direction. Instructional goals translates into budget objectives and forms a base for considerations when funds are allocated for science instructional resources. In Budget planning process instructional goals are transformed into one of the budgeting objectives purposely to strengthen instructions in secondary schools. The concern of this study was to establish whether secondary schools in Nairobi County science instructional resources are considered when setting budgeting objectives.

Budget planning should aim at ensuring adequate funds allocation for instructional resources in secondary schools. Moswela (2009) did not look at budget planning specifically, but compared school development planning in Botswana and in both England and Australia by considering budgeting process as a critical determinant in realization of instructional aims. Moswela (2009) study considered development planning accompanied by capital budgeting with limited regards to instructional management and was much concerned with physical facilities such as laboratories. Confirming this

scenario Njagi and Jagongo (2013) in a study on capital budgeting in public secondary schools in Kenya found out that in education sector much concern was given to physical facilities. Secondly, Moswela (2009) made comparison with more advanced countries instead of in sub-Saharan country like Kenya.

2.4.2 Budgetary Requests and Utilization of Science Instructional Resources

School budgeting process at planning phase requires budgetary requests to come from all departments and sections within the institution. This should be provided for in secondary schools financial management policy which outlines budgetary ceilings for different activities. Ojiambo (2010) from a study in Bungoma District focussing on financial management and quality of education in public secondary schools recommended that sections and departments should have opportunities to meet with the budgeting committee to give clarification on departmental budgetary requests. Budgetary requests from sections and departments within secondary schools show the proposed use of resources by key activities that would provide information necessary for budget alternatives. From Science department budgetary request should be prioritized to include acquisition of instructional resources necessary for class instructions.

According to Roza (2009) in an article on school budgeting, budgetary requests build on progress on key developments over the past year within departments. Science department budgetary requests would indicate resources required to enhance instructional management in secondary schools. Ideally, through budgetary requests secondary schools are capable of implementing of instructional management goals with the aim of securing

a strong future for every student. Instructional management goals are achieved by emphasizing and promoting quality science learning. As earlier noted by Clarke (2007) budget planning is a forward-looking process and requires involvement of science teachers in coming up with budgetary requests as instructional managers from the departmental level.

Further, Roza (2009) noted that improved learning outcomes from Science instructions positions learners for success as adults and promotes economic growth and global competitiveness. Budget requests should support continued innovation in instructional management by providing increased resources to scale up new models for teaching and learning. According to Wadesango (2011), scaling up new models for science instructions through budgeting process provides an excellent focus on equity at each level of education system, in every school and in all departments to ensure quality instructions. Well-structured and budgetary requisition procedures will enable secondary schools to realize science instructional goals. This should be set in a way that Science teachers place their budgetary request based on their schemes of work.

2.4.3 Budget Prioritization and Utilization of Science Instructional Resources

Financial management policy in a school is crucial in outlining how use of funds should be prioritized to avoid wastage and misappropriation. According to Clarke (2007), budgeting is a forward-looking process guided by identifying priorities. The reason for prioritization is to ensure that available institutional financial resources meet budgetary needs in the best way possible toward realization of set educational gaols. Consequently,

channelling resources towards activities which will have the greatest impact toward realization of instructional goals should be the focus of secondary schools budgeting process. In realizing instructional goals means that learners have access to rigorous coursework through appropriate utilization of instructional resources. Prioritization should be focussed on improving science learning outcomes through adequate budgetary allocation.

In budget development process, prioritization should include assessing the initiatives funded in science department in the previous budget cycle. Representation of science teachers should provide a status update on the progress of all initiatives their area and to what degree they have been accomplished. Florescu (2012) noted that with the knowledge of reasons behind budgetary cutbacks, science teachers would come up proposal to restructure delivery approaches in the classroom while still focusing on the overall schools instructional goal. In general using a common approach to budgeting is not only an across-the-board reduction process, but should result into reviewing instructional approach to maintain focus on favourable learning in Science subjects as priority.

Prioritisation for instructional management involves deciding on appropriate resources that must be availed for effective teaching and learning. However, prioritization would be of no value if instructional resources budgeted for are not sourced or not appropriately utilized to improve science learning. A study conducted by Oboegbulem and Kalu (2013) in Nigeria highlighted that budget guideline specifications are followed by secondary

school principals in planning and implementing budget, science instructional resources are not adequately sourced. For appropriate utilization, science teachers ought to be present during prioritization through representation by either head of department or specifically appointed member in secondary schools budgeting committees. This study sought to establish the extent of involvement of science teachers in prioritization during budgeting.

Secondary school principals need to work in collaboration with Science teachers to ensure adequate budgetary allocation is given for instructional resources. Taking into considerations overall science instructional management policy in defining budgeting priorities I provides better chances of realizing better learning outcomes in terms of performance in examinations. In a study on school principals' effectiveness and leadership quality in educational management, Luck (2011) established that there is some evidence that involvement of Science teachers in prioritization reduces tensions between the staff and school management. Ideally, less tension between Science teachers and management will enhance utilization of instructional resources. This study focused on the level of involvement of science teachers prioritization on departmental list of instructional resources is being discussed in budgeting committee of secondary schools.

2.4.4 Budgetary Projection and Utilization of Science Instructional Resources

Secondary school budgeting committees hold multiple sessions to deliberate the proposed initiatives from departments and sections focusing on aligning financial commitment of the projected resources that will be available. Getange, Onkeo and Orodho (2013) in a

study on alternative sources for funding for public secondary schools in Kisii County established that principals have devised alternative sources of financing education. In such cases, a forecast of projected revenues include alternative sources such as income generating activities considered friendly to parents, school fees and funding from FDSE. School financial management policy should provide a system projection to link budgeting objective on science instructional management and available resources. Therefore, this study intended to establish if system for projecting revenues is established to link budgeting objective on science instructional and available resources in secondary schools in Nairobi County, Kenya.

Oplatka (2004) in an article on the role of principals in institutional management noted that secondary schools in developing countries have challenges in managing limited revenues due to autocratic leadership style, less open and low degree of change initiation in budgeting for instructional resources. Such kind of leadership makes it difficult task for secondary schools to carry out revenue projection and in turn will negatively affect instructional management. Echoing this position, Mbugua and Rarieya (2014) asserted that secondary schools leadership should strategically consider involvement of Science teachers in revenue and expenditure projects for effective teaching and learning outcomes in biology, physics and chemistry.

There is limited scholarly work on the role of teachers in revenue and expenditure projection. Further, no work has been done to establish significance of revenue and expenditure projection during budget planning in secondary schools in Nairobi County

towards realization of better learning outcomes in sciences. Getange, Onkeo and Orodho (2013) explored adequateness of government funding in meeting expected secondary schools expenditures without due regard to instructional management by relying on literature from desk review and questionnaires filled by secondary school principals. In this study, questionnaires were filled by science teachers from both public and private secondary schools, principals were interviewed to establish how revenue and expenditure projection influence budgetary allocations on utilization of science instructional resources in secondary schools in Nairobi County, Kenya.

2.4.5 Budgetary Allocations and Utilization of Science Instructional Resources

Budgetary allocation of funds by budgeting committee should be based on considerations of a combination of programmatic and formulaic approaches linking Science instructional management to overall school educational goal. In their work, Ankomah, Koomson, Bosu and Oduro (2005) on implementing quality education in low-income countries suggested that Secondary schools should efficiently and effectively manage budgeting process in order to ensure that available resources are considered for instructional management. Limited and tighter revenue sources for secondary schools budgeting processes have resulted in challenges of tying allocations and expenditures to strategic goals. It is necessary to consider science instructional resources among other requirement for long-term institutional sustainability.

Further, Chetambve and Sakwa (2013) from their study on effects of financial training on financial performance of schools in in Trans-Nzoia County, Kenya, recommended that

schools' financial management policies should reinforce transparency in budgetary allocation to ensure good learning outcomes. In allocating funds for Science instructions it is prudent to specifying what has been given per subject per class as requested by Science department. Supporting Chetambve and Sakwa (2013) recommendation, Gachithi (2010) suggested the need for proper procedures and guidelines in the allocation of funds to ensure instructional goals are realized. However, Chetambve & Sakwa (2013) just like Gachithi (2010) did not consider budgetary allocation per subject per class. This study went further to establish if budgetary allocations for science instructional resources are delineated per subject per class in secondary schools in Nairobi County, Kenya.

Budget planning procedures and guidelines as noted by Banuso (2003) would ensure delineated budgetary allocations for sourcing of instructional resources in secondary schools per each of the three subjects per class. Delineation of budgetary allocations for Science instructional resources per each of the three subjects per class will improve utilization and positively influence learning outcomes. This would be in tandem with recommendation made in study in Nigeria on financial management of public secondary schools by Adeogun (2001) which proposed that each lesson should adequately be taught with appropriate instructional resources. Availability of appropriate instructional resources in each science lesson will automatically improve Science instructions in secondary schools.

In conclusion, Makhubela (2005) considered budget planning as an instrument that contributes constructively towards enabling educational programmes implementation in

secondary school. Budget planning involves bringing input from staff, parents and the community together for purposes of realization of quality education (Gachithi, 2010). In this respect, budget planning involves reference to school financial management policy to set up structures for handling budgetary allocations in a coordinated approach through consolations with staff (Ntseto, 2009). In the view of reviewed literature this study hypothesized that there is no significant relationship between budget planning procedure and utilization of instructional resources in Science instruction.

2.5 Budget Monitoring and Utilization of Science Instructional Resources

Managing secondary schools budget implementation according to Kruger (2005) should be a flexible process in taking care of emerging issues. Keeping track of income and expenditure is a basis of prudent financial management practice in secondary schools and is essential for appropriate utilization of instructional resources. Ideally, it ensures adequate supply of instructional resources for science learning in secondary schools throughout an academic year. For income and expenditure to be tracked effectively, secondary schools need a monitoring mechanism that allows participation of science teachers to ensure realization of quality instruction throughout the year. According to Gogo (2002) provision of quality education is dependent on availability of instructional resources at the right time and this can only be ensured through effective budget monitoring.

Bendikson, Hattie and Robinson (2011), in a study to identify comparative academic performance of secondary schools in New Zealand asserted that learning achievements

closely reflects the taught curriculum, which in itself is dependent on how effective instructional resources utilized. Effective utilization of instructional resources can only be assessed though a well-designed monitoring and evaluation framework. This, according to Bendikson et al (2011) this is achievable through a combination of criterion-based internal and external mechanisms for assessing learners' achievement in secondary school curriculum. National Certificate of Educational Achievement (NCEA) of New Zealand is an example of combination of criterion-based assessment. NCEA is a school-level results assessment reflecting student achievements and schools' leadership to organise, deliver, and monitor instructional management (Sammons and Luyten, 2009).

Sammons and Luyten (2009) in an article on alternative methods for assessment based on both school effects and schooling effects noted that it was necessary to investigate the role of science teachers in monitoring instructional leadership purposely to ensure proper resource utilization. This could easily be achieved through NCEA which is a more school based assessment. This is different from Kenya's KCSE which is an end-cycle evaluation. In their findings, Bendikson et al (2011) established that secondary schools were more likely to improve earning in sciences when instructional resources are adequately supplied throughout out the year. Adequate supply of instructional resources throughout the years is only guaranteed through effective budget monitoring to show how much of the budgetary allocations for instructional resources been spent at a given time.

Thomas, Peng and Gray (2007) in an article on modelling patterns of improvement in secondary school English, established that inadequate instructional resources in some

educational institutions may not necessarily be due to inadequate funds, but to ineffective budget monitoring on expenditure. Generally, a systematic analysis using a number of indicators through a well-defined information management platform is the key in establishing appropriate science instructional resource utilization. Effectiveness teaching and learning process can be tracked to utilization of instructional resources from form one to form four in secondary schools. This would require a monitoring framework that incorporates the role of science teachers in setting benchmarks, delineation of allocations, procurement management, and expenditure reports and budget reviews.

2.5.1 Benchmarking and Utilization of Science Instructional Resources

Budget monitoring in secondary schools is a performance measurement system which requires benchmarking. According to Walter (2009) monitoring provision of instructional resources involve setting benchmarks because spending of budgetary allocations cannot be implemented without a performance measurement system. Once budgetary allocations for instructional resources have been done sourcing should be done within a set of standards established through benchmarking (Sammons and Luyten, 2009). As part of an effort to utilization of science instructional resources in leaning process benchmarking is useful in ensuring quality and quantity adherence. In science instructional management benchmarking would mean setting standards on type, expected price, quality and quantity of resources that would ensure effective teaching and learning in secondary schools.

Tracking utilization of instructional resources needs data driven budgeting where decisions are based on reliable information through performance indicators, which should

clearly be defined during benchmarking. Ojiambo (2010) from his work on influence of financial management on quality of education recommended close check and monitoring of financial records. This will ensure adherence to budgetary benchmarks in instructional management in secondary schools. Budgeting committees or any design body in secondary schools need to come up with benchmarks for monitoring budget implementation to ensure appropriate utilization of instructional resources. This study sought to establish the role of science teacher in setting benchmarks for sourcing of instructional resources in terms of quality and quantity required in both public and private secondary schools in Nairobi County, Kenya.

2.5.2 Delineation of Allocations and Utilization Science Instructional Resources

Secondary schools need to focus on ensuring that once appropriate budgetary allocations are made for science instructional resources they are delineated for learning in all classes from form one to form four. Oboegbulem and Kalu (2013) in an article on budgeting practices of secondary schools in Nigeria stressed the need to practice performance based budgeting. The possibility of performance-based budgeting being practiced in secondary schools improve syllabus coverage and learning outcomes in biology, chemistry and physics in secondary schools. Further, Oboegbulem and Kalu (2013) established that as much as secondary school principals may follow specifications of budget guideline in budget planning, they do not necessarily buy science instructional resources. This could be attributed partly to lack of delineation of budgetary allocation for instructional resources.

Budget monitoring promotes accountability in sourcing and utilization of instructional resources. This study focussed on influence of budget monitoring on utilization of instructional resources and targeted Science teachers and the principals. This was in line with recommendation by Ojiambo (2010) that budget monitoring planning should involve teachers as instructional managers. Secondly, monitoring utilization of Science instructional resources requires reliable information through defined performance indicators in collaborative approaches. Such performance indicators should include specific type and quantity of science instructional resources needed in each class. With these in place, budgetary allocations for science instructional resources could easily be delineated per class.

Kaguri, Njati and Thiaine (2014) in a study on financial management challenges facing implementation of FDSE in Imenti North District, Kenya recommended the need for improvement on resource tracking policies of to ensure proper, adequate and accountable utilization. As already mentioned tracking in utilization of instructional resources need data driven performance based budget practice in which budgetary allocations for instructional resources are delineated pe subject per class. In their study, Kaguri, Njati and Thiaine (2014) were concerned with challenges of financial management that ought to be addressed in order to have a sustainable FDSE. This study was more specific on the role of budget monitoring on utilization of science instructional resources in secondary schools in Nairobi County, Kenya.

2.5.3 Procurement and Utilization of Science Instructional Resources

One of the objectives of budget monitoring is adherence to procurement procedures that would have influence on quality instructions. Procurement management as budget monitoring function has attracted much attention worldwide because it is associated huge amounts of public resources (Rambo, 2012). Globally, public procurement is an essential in service delivery practice in managing national expenditures worldwide (Basheka and Bisangabasaija, 2010). In Kenya, Public Procurement and Asset Disposal Act 2015 (PPADA) provisions guide expenditure in public institutions. In secondary schools it grants teachers and subordinate staff the power to control procurement process through tendering committees. Adherence to provisions of PPADA is good financial management practice for public and private secondary schools to adopt similar procurement procedures as to enhance utilization of science instructional resources

Setting up tendering committees in public secondary schools was aimed at decentralization of the process which was a preserve of principals in the past (Odhiambo & Kamau, 2003). This study focussed in establishing the extent of decentralization in procurement in secondary schools involve Science teachers through their department in controlling sourcing of instructional resources. However, while several secondary school principals seems to believe that Science teachers lack of knowledge on financial management as noted by Sharp and Walker (2005). Their participation in tendering committee would ensure proper expenditure of budgetary allocations for on instructional resources. Limited capacity of Science teachers in financial management could be

enhanced through training in secondary schools purposely for realization of school overall instructional goal.

Onyinkwa (2013) in a study on compliance to procurement regulations in Kenyan public secondary schools, established that training of tendering committee enhance adherence to provisions of PPADA. Training of tendering committee would ensure effective utilization of Science instructional resources by making sure that the right type quality and quantity are procured for teaching Biology, Chemistry and Physics for different classes. However, before considering training of tendering committee as a significant factor in procuring instructional resources, it was necessary to establish the extent to which science teachers are involved. Specifically, it was vital to establish if in each term, science department draws up a procurement plan for instructional resources in secondary schools in Nairobi County, Kenya.

Odhiambo and Kamau (2003) in an OECD working paper on public procurement lessons from Kenya, Tanzania and Uganda asserted that financial management systems in secondary schools were shrouded by secrecy, inefficiency, corruption and undercutting. This assertion by Odhiambo and Kamau, (2003) could be a challenge to instructional management because it is an indication of minimal involvement of science teacher in procuring teaching and learning resources. Further, Wagithunu et al (2015) noted that lack of professionalism in secondary schools financial management minimized science teachers' participation in procuring instructional resources. These scenarios as presented by (Odhiambo & Kamau, 2003) made it necessary to establish significance of science

teacher involvement in procurement on utilization of instructional resources in learning Biology, Physics and Chemistry.

2.5.4 Expenditure Reports and Utilization of Science Instructional Resources

Budget monitoring reports are generated from financial records and are vital in providing information about spending patterns in instructional management. According to Deegan and Unerman (2011), budget monitoring reports are prepared by the school bursars using financial information systems. Records of expenditures on Science instructional resources should include how much have been spent from the amounts allocated in the budget According to Ojiambo (2010), school financial information system shows expenditure records in terms of budgeted revenues, actual revenue and costs to date and the variances between them**.** However, for effective instructional management is prudent for Science teachers to have access to school financial information system to enhance learning in Biology, Physics and Chemistry.

Expenditure records are vital aspects of decision-making in instructional management and would have an influence on utilization of teaching and learning resources in science subjects. According to Hoy and Miskel (2008) in a book titled '*Educational Administration: Theory, Practice and Research"* asserted that management of expenditure records on sourcing for instructional resources in secondary schools is complex to be performed by principal and bursar alone. Ideally, school financial information systems require participation of various stakeholders at different levels. Specifically involvement of Science teachers in management expenditure records in

sourcing for instructional resources is a significant factor towards good learning outcomes in Biology, Physics and Chemistry. Expenditure records provide significant information to school management in terms of budgetary allocation and actual costs.

Supporting Science teachers' involvement in management expenditure records De Grauwe et al (2011) advised that ensures appropriate utilization of Science instructional resources. Otherwise, lack of Science teachers' participation in keeping expenditure records of teaching and learning resources would reflect unsatisfactory linkage between financial leadership and instructional management in secondary schools. Further, according to Kipkoech and Chesire (2011), general lack of participation of teachers in secondary schools in keeping of expenditure records results into their managerial abilities remaining unrecognized. Therefore, establishing the role of Science teachers in decision-making regarding both financial management in secondary schools including, record keeping and its influence on utilization of instructional resources was necessary.

Appropriate linkage of financial leadership to instructional management could be lacking when secondary school principals take up most of the managerial decisions and this can be caused by policy directive. Motsamai, Jacobs and Corene (2011) in a study on financial management in Lesotho's secondary schools found out that there is no clear policy directive on leadership touching on expenditure records. With a clear school financial management policy, science teachers would have a defined role in keeping expenditure record for sourcing of instructional resources. Specifically, in this study, the role of science teachers in keeping records of transactions on instructional resources and

periodic reporting was sought through questionnaires in secondary schools in Nairobi County, Kenya.

2.5.5 Budgetary Reviews and Utilization of Science Instructional Resources

Secondary schools financial information management systems should be useful in monitoring data for budget reviews and refocussing instructional resources. However, budget monitoring in secondary schools should not only focus on adherence to financial management practices and procedures, but its effect on utilization of instructional resources. Njagi and Jagongo (2013) from a study on capital budgeting procedures and practices in public secondary schools in Kenya advised educational institutions to come up with corrective actions to be taken and allocations revised whenever there is a diversion in spending. Ojiambo (2010) asserted that corrective measures can only be achieved when there is monitoring reports showing budgeted amounts, updated revenue and costs from which variances could be calculated and reviews undertaken in secondary schools.

Financial reports can be used as means of revising expenditure and performance against budgetary allocations to ensure appropriate utilization of instructional resource for learning Science subjects. Secondly, regular budgetary review through financial evaluation would enhance efficiency in instructional management and improve learning outcomes in secondary schools. Concurring with this position, Banuso (2003) in a case study on factors affecting Nigerian secondary school students' academic performance, noted that instructional resources are need not only be adequate but must be provided at

the right time for realization of good learning outcomes. One way of ensuring adequacy and availability of science instructional resources is through budget reviews involving participation of teachers.

Gogo (2002) in a study conducted in Rachuonyo district, Kenya on impact of cost sharing on quality of secondary education asserted that in order to realize good learning outcomes, instructional resources should be availed at the right time. Ideally, periodic budget reviews would ensure instructional resources are availed throughout the year and at the right time in secondary schools. This in turn ensures quality instruction through appropriate utilization of science instructional resources in secondary schools. Further, appropriate utilization of science instructional resources would ensure realization of good learning outcomes in sciences based subjects. This study therefore explored the extent to which Science teachers participate in periodic budget reviews to incorporate changes in instructional resources demand in secondary schools in Nairobi County, Kenya.

2.6 Budget Control and Utilization of Science Instructional Resources

Budget control and the effective use of resources is an integral part of secondary schools financial management practices. According Cole and Kelly (2011), budgetary control is a set institutional management policy requirement responsibilities related to budget practice. In secondary schools instructional management, budget related responsibilities include requisition procedure, spending authorization, transactions records, payment confirmation and reconciliation of purchases for teaching and learning materials. Further,

as noted by Block and Geoffrey (2008), budget control mechanisms could provide a continuous comparison of actual expenditure with budgeted results towards realization of instructional goals. This study sought to establish how control budget mechanisms in secondary schools influence utilization science instructional resources.

Budget control mechanisms provide a base for budgetary revision and are essential in ensuring budgetary allocations for science instructional resources are spent as planned or targets are revised appropriately towards realization of good learning outcomes. Supporting this position, Boddy (2011) assertesd that budget control is essential in budgeting process to ensure financial resources occur as planned or unrealistic plans and targets are revised, where appropriate. Budget control ensures checked adequacy and availability of instructional resources for utilization in learning science subjects. Budget control therefore provides a link to planning essential in analysing learning outcomes. In this study the focus was on significance of budget control mechanisms on utilization of Science instructional resources in secondary schools.

In instructional management, budget mechanisms would be useful in determining the influence of school financial leadership on learning outcomes in Science subjects. Akyaa (2011) assessed financial control practices in a study conducted in New Juaben Senior High Commercial School-Koforidua Ghana and established that expenditure exceeds revenue due to regular changes in price levels. Price changes would have a significant effect on utilization of instructional resources if budget control mechanisms are not appropriate in secondary schools. Information on price changes would not be revealed

unless an effective budget control mechanisms are in place to provide necessary information for analysing expenditures against revenues and budgetary allocations. According to Cole and Kelly (2011) this will be a base for revision to ensure budgetary allocations for science instructional resources towards realization of good learning outcomes. This study sought to establish budget control mechanisms in secondary schools in Nairobi County and their influence on utilization of science instructional resources.

Akyaa (2011) study focused on budget control practices in a single institution. However, this study examined budget control mechanisms in a number of secondary schools in Nairobi County to establish their effects on utilization of Science instructional resources. It involved effects of requisition procedure, spending authorization, transactions records, payment confirmation and reconciliation of purchases on utilization of instructional resources in secondary schools in Nairobi County. Secondly, Akyaa (2011) used questionnaires distributed to headteachers, assistant headteachers, accounts officers, teachers and student executives. In this study data was collected from Science teachers and form four students using questionnaires while from secondary school principals' information was sought using an interview schedule.

Budget control mechanisms could enable measurement of utilization of instructional in Science subjects against budgetary allocation and implementation. When effectively done a measure on utilization would enable corrective actions undertaken towards improvement of learning outcomes in Kenya secondary schools, provisions of PPADA of

2015 were intended to improve efficiency in utilization of public resources as a well as minimizing losses. However, according to IPAR (2007) in an occasional publication on making public secondary education affordable, it was asserted that majority of secondary schools did not adhere to some of provisions of PPDA. This study did not focus on the provision of PPADA but on the role of science teachers' in budget control mechanisms for the purpose of influencing utilization of Science instructional resources.

Kipng'etich and Ahmed (2007) from a study on head teachers' perception of their roles in secondary schools in Kenya noted that lack of effective information processing has made it difficult to track sourcing of instructional resources from the teacher, head of Science department, bursar to the principal. Secondary schools principals should therefore use financial tools to exercise budget controls through policies and procedures established by institutions for managing, documenting and reporting of transactions. However, Odhiambo and Kamau (2003) had noted discrepancies in the way secondary school principals communicate and report financial issues. This according Mutahi (2003), is attributed to non-adherence to budget control mechanism even where they are fully understood. Secondary schools should put in place effective budget control mechanisms to ensure that financial transactions are backed supporting documents.

2.6.1 Requisitions Procedures and Utilization of Science Instructional Resources

Secondary schools require a wide range of Science instructional resources in order to achieve educational goals. Good practice requires that requisition of science instructional resources results in the best quality product at the most affordable cost (Gachomba,

2012). As a control mechanism, secondary schools are expected to standardized requisition procedures carefully prepared to meet needs and requirements of instructional management. This will ensure that information flow according to established guidelines and regulations in sourcing science institutional resources (Griffith & Griffith, 2002). In this study the focus was to establish existence of pre-designed requisition procedures for instructional resources in used by Science teachers in secondary schools in Nairobi County.

Regardless of how good financial management practices exist in secondary schools, there is a requirement to maintain standards of operation, particularly on requisition of instructional resource for realization of educational goals. According to Okumbe (2004), secondary schools through proper requisition practices for sourcing instructional resources would have regulated fiduciary responsibilities. However, according to Transparency International (2010) in a study carried in 2010 on procurement practices in secondary schools, it was noted that requisition procedures are prone to governance risks. This according Mutahi (2003) is attributed to non-adherence to budget control mechanism even when fully understood and this results to wastage of resources that would otherwise strengthen Science instructional management in secondary schools.

2.6.2 Spending Authorization and Utilization of Science Instructional Resources

As part of financial management practices, secondary schools need an accounting system to provide accountability of all funds allocated for various activities including science instructional resources. Systematic authorization procedure is necessary for timely

sourcing for instructional resources in secondary schools. Mngoma (2009) conducted a study in South African on decentralised financial management schools and recommended that principals as financial controllers and accounting officers should have authority to obligate institutions to spend money is significant. Mngoma (2009) focus was on selected primary and secondary schools in Kwa Ndengezi area in Kwazulu-Natal of South Africa. Similar focus was necessary to examine budget implementation to establish system of spending authorization in secondary schools in Nairobi, Kenya.

Koross, Ngware and Sang, (2008) conducted a study on parental contribution to financial management in secondary schools in Kenya and delegated authority within secondary school financial management system as a budget control mechanism. In practice, some secondary schools delegated spending authorization responsibility to bursars, head of science department or deputy principal. Kuria (2007) in a study conducted in Thika district on .budgeting process and financial management in public secondary schools recommended that limited delegation of spending authority could be granted to the bursar or head of Science departments. This could be possible in more established schools and as a noted by Koross et al (2008), any purchase by staff members without prior consent by the appropriate individual will be deemed unauthorized. This study sought from Science teachers if orders for instructional resources were approved by the principal to give authority for delivery.

2.6.3 Transactions Records and Utilization of Instructional Resources

Adequate books of account should be maintained in secondary schools and often updated as a control mechanism in instructional management. In managing budgetary allocations for instructional resources, school bursars and accounts clerks are expected to assist principals in keeping records of transactions for effective utilization (Mestry, 2004). In Kenya, financial management guidelines from MOEST demand that maintain proper accounting records in secondary schools for revenues and expenditure. Maintenance of proper transactional records is also a requirement private secondary schools must subscribe to for effective instructional management. This study focus was on maintenance of transaction records and its influence on science instruction in both private and public secondary schools in Nairobi County.

Onyinkwa (2013) conducted a study on public secondary schools compliance to procurement regulations in Kenya and recommended that ethical considerations need to put in place for ensuring that transactions are objectively done and in an accountable manner. This would ensure adequacy and availability of science instructional resources which would significantly influence learning outcomes in Biology, Physics and Chemistry in secondary schools. Secondly, ethical considerations in secondary schools in transactions would lead to compliance on quality of instructional resources. This study focussed on establishing from teachers and principals if records of all orders and copies of delivery notes for science instructional resources are kept at science department in secondary schools in Nairobi County, Kenya.

2.6.4 Payment Confirmation and Utilization of Science Instructional Resources

Instructional resources are required to be adequately provided in form, quality and quantity for learning to take place. This is meant to support the broader school educational goal through instruction in the classroom. Before any payment is done science teachers as end users should ascertain both quality and quantity of instructional resources supplies. Ogachi (2006) in an article on regulation of procurement personnel in Kenya asserted that confirmation of payments is part of the accountability process which guarantees that school money has been used in a responsible and profitable manner as intended. This study investigated from public and private secondary the role of Science teachers in confirming quality and quantity of instructional resources supplied before payment is done in Nairobi County.

Nyanyuki et al (2013) assessed accounting practices in public secondary schools in Kisii Central District recommended that a systematic process should be in place from subject teacher through head of Science department to the principal to approve payment by the bursar or accounts clerk. Agreeing with this, Wadesago (2011) asserted that Science teachers' participation instructional management decision making is mandatory for the attainment of good learning outcomes in secondary schools. Further, in an article on participative decision-making in South Africa, Mokoena (2011) insisted that science teachers should be given the opportunity to play their defined and legitimate roles in instructional management. The concern of this study was the role of Science teachers in

checking quality of instructional resources on delivery before any payment is done in secondary schools in Nairobi County, Kenya.

2.6.5 Purchases Reconciliation and Utilization of Science Instructional Resources

Reconciliation of purchases is a management trail that allows financial transactions to be traced from the accounting records to the original budget document. Mestry (2006) from an article on school financial accountability argued that budget can only be declared credible by measuring the number of deviations from budgetary allocations. The amount of funds allocated for different activities deviates through supplementary re-appropriations given new demands during a fiscal year. Secondly, credibility is determined by differences of final excess spending and savings over the approved budget. Reconciliation of purchase of interest should be on what was budgeted to measure deficit or surplus. This study sought from Science teachers whether there is regular reconciliation of purchases on instructional resources at departmental level in secondary schools in Nairobi County.

Purchases reconciliation involves working with money spent, deficits and surpluses in figures. The challenge as noted by Luck (2011) is lack of openness of secondary school principals on financial issues in most institutions. Agreeing with this position Mestry and Bisschoff (2009) noted that some principals do not share financial matters with their staff. Scenarios exist where a large number of Science teachers are not aware when instructional resources are supplied. In such cases Science teachers are equally uncertain if purchases reconciliation takes place. This could explain Wadesango (2011) assertion

that some teachers perceive their role to be inculcating knowledge to their students and will always try to avoid issues to do with school finances. However, it was necessary to investigate possibility of regular reconciliation of purchases on instructional resources at departmental level in secondary schools in Nairobi County, Kenya.

2.7 Science Instruction

Science is an instrument for development and a key player in spearheading technological advancement, national wealth creation and accelerating industrialization. Sciences learning focus on investigating phenomenon through scientific enquiry. Sciences subjects equip learners with manipulative skills through utilization of instructional resources in class and laboratory. According to Ajileye (2006), in a study carried out in Nigeria, found out that insufficient instructional resources is a major factor in student underachievement in science. Insufficient instructional resources can lead to inadequate learning outcome in sciences and is threat to industrial development and economic growth in developing nations like Nigeria and Kenya. This study focused on how budgetary allocation would influence availability and utilization of Science instructional resources in secondary schools in Nairobi County, Kenya.

Amunga, Amadalo and Musera (2011) in an article on implications for Vision 2030 from learning achievements in chemistry and biology in secondary schools underscored the key role of science instruction in spearheading national development through technological advancement and promoting growth by accelerating industrialization. Kenya's vision 2030 puts more emphasis on science, technology and innovation as

recipes for elevating the country into an industrializing middle income country providing high quality life for all its citizens. Achieving industrializing middle income country status would require effective Biology, Chemistry and Physics instructions at secondary level of education. Improved learning outcomes in science depend on proper linkage of financial leadership with instructional management in secondary school through adequate budgetary allocation for teaching and learning resources. This study linked learning Sciences in secondary schools with budgeting process for provision of instructional resources.

2.7.1 Sociological Basis of Science Instruction

Sociological approaches in instructional process provide insights on familiar problems associated with learning Science subjects for students in secondary schools. Teaching Science focusses on socializing learners into a community of scientific practitioners. This social interaction according to Gewirtz and Gribb (2009) help learners in solving societal problems through application of scientific knowledge. Learning science apprenticeship and socialization leads into conceptualization of knowledge and epistemic practices. This sociological perspective makes learners to see new light in their world ((Burusic, et al, 2012).

Social aspiration for progress in improving life is fundamentally the importance of science instructional process. Through science instruction the country provides an opportunity for learners to be part of national development in wealth creation and industrialization. At personal level learners through science instructional management

will be sociologically moulded to develop and uniquely grow according to their potential and needs. Sociological basis of learning can be explained through a number of theories such as functionalism. However, education a sociological function works by contributing towards preparing young people to develop and grow to realize their potential (Ballantine, 2001). Instructional management has manifest functions of transmitting knowledge and latent one of transmitting of culture and promoting social change.

2.7.2 Philosophical Basis of budgeting for Science Instruction

Philosophy entails the ability to search for knowledge through logical thinking. Science teaching through inquiry can be viewed as an approach for communicating scientific knowledge and practices to learners in secondary schools (Hassan, Asimiran, Rahman & Kamarudin, 2008). Practice of science according to Toplis and Allen (2012) enhances learners' experience, understanding, and skills to scientifically think and act in the process of knowledge acquisition. Philosophical groundings offer ways of understanding inquiry, knowledge, and social practices. This is in tandem with Millar (2004) assertion that practical work through observation, experimentation, measurement, inference, explanation, and modeling. This will motivate learners to acquire new knowledge, which they can incorporate and apply for self-growth and development. Appropriate utilization of instructional resources encouraged knowledge acquisition through science learning.

2.8 Utilization of Science Instructional Resources and Budgeting

Instructional resources include books, science equipment, audiovisual equipment, charts, writing boards and other educational materials required for effective learning to take place (Yousuf and Ahmed, 2005). Their utilization is vital to teaching of science subjects because they glue discovered facts firmly to the memory of learners. According to Owoeye and Yara, (2010) use of instructional resources in lessons banishes apathy and arouses learners' interest practically through seeing and doing. Generally, instructional resources help in-depth understanding by making the lesson attractive to learners thereby arresting their attention. This is achievable when instructional resources are appropriately budgeted for, availed and utilized. Therefore, it was necessary to investigate the influence of budgeting process in utilization of science instructional resources in secondary schools in Nairobi County, Kenya.

Sub-saharan Africa has acknowledged motivational influence of utilization instructional resources. Akisanya (2010) in a study carried out in Secondary Schools in Ogun State in Ghana noted that utilization of instructional resources enhance proper teaching and learning. From Nigeria, Ajuago (2002) noted that availability of instructional resources facilitated learning through understanding of abstract concepts, help in class control and have positive correlation with acquisition of knowledge and skill in sciences. This argument was shared by Olagunju and Abiola (2008) who conducted a study in Nigeria and asserted that utilization of instructional resources motivates learners. Further, Motswiri, (2004) from Botswana noted that effective learning depends on availability and utilization of instructional resources.

Appropriate utilization of instructional resources is a key determinant of learning outcomes in science subjects. Supporting this position, Okorie (2001) maintained asserted that appropriate utilization of instructional resources during teaching and learning process stimulates and motivates students. Momoh (2010) conducted on factors affecting students' achievements in West Africa School Certificate Examinations (WASCE), confirmed Okorie (2001) asserted that learning outcomes in sciences are closely linked to utilization of instructional resources. Using data collected from teachers, Momoh (2010) correlated instructional resources employed during instructions with academic achievements of students in ten subjects and concluded that their utilization have a significant effect on learning outcomes.

A study conducted by Ongiri and Abdi (2004) revealed that only in about 600 out over 4000 secondary schools post good examinations results year in year in sciences in Kenya. Schools that post good performance in sciences should be having rigorous systems of accountability to ensure proper utilization of instructional resources. It is therefore key to examine how budgetary allocations influence utilization of science instructional resources in secondary school in Nairobi county. Meghir (2002) agreed that examination of schools' expenditures is important for ascertaining utilization of instructional resources in learning sciences and should be guided by school management financial policy. According to Ibe-Bassey (2002), good financial management policy guiding budgetary allocations with flexible control mechanisms in ensuring appropriate utilization of instructional resources.

In as much as Johan (2004) agreed with Meghir (2002) and Ibe-Bassey (2002) that schools that do not have adequate instructional resources are unlikely to post good results in national examinations. There is limited scholarly work on appropriate utilization of such resources and could linked to budget control mechanisms in secondary schools. This study sought to answer this question by looking at how budget control mechanism in secondary schools correlate with utilization of science instructional resources for effective learning of in secondary schools in Nairobi County, Kenya. This study hypothesized that that the poor performance in science subjects in Nairobi County could be due ineffective utilization of instructional resources.

2.8 Summary of Literature Review and Research Gaps

This matrix is a summary of reviewed literature highlighting authors, focus, methodologies and findings of related studies. Further it provides the focus of this study in relation knowledge gaps from reviewed articles.

Author	Focus	Methodology	Findings of the study	Knowledge Gap	Focus of this Study
Robinson, V. M. J., Lloyd, C. A., & Rowe, K. J. (2008).	impact of different types of leadership on students' academic and nonacademic outcomes in Newzealand	The methodology involved an analysis of findings from 27 published studies of the relationship between leadership and student outcomes.	the average effect of instructional leadership on student outcomes was three to four times that of transformational leadership	Relatioship between financial leadership and budgetary allocation for instructional resources	Influence of bubdeting process on utilization of instrcutional resources
Motsamai J M, Jacobs J and Corene de Wet (2011):	School principals financial management capacity in Lesotho	Qualitative content analysis was used to analyse the narratives. Identified themes were juxtaposed with the Lesotho Ministry of Education's policy guidelines on financial management	absence of a clear policy directive on financial leadership and control is reflected by unsatisfactory financial leadership and arbitrary auditing practices	Infleunce of financial leadership in budgeting for instructional resources	Influence school financial management policy on utilization of instructional resources
Lawrence L S and Orodho J A (2014):	influence Kenya vision 2030s' education policy flagship targets on the enhancement of quality education in public secondary schools in Nakuru	The study used descriptive survey design. Stratified random sampling was used to select 10 principals from 24 and 32 teachers from 308, constituting 41.7 % and 10.3 % of the target population of principals and teachers in	skewed distribution of teaching and learning resources in favour of national schools thereby disadvantaging the district schools	The need to establish school level adequacy in science instructional resources	Budgeting process as means of ensuring adequacy of science instructional resources

	District	Nakuru District, respectively, to participate in the study			
Wanjala C N and Rarieya J F A (2014):	Explored the factors that have facilitated some schools to successfully engage in strategic planning	It employed a qualitative multiple case design and engaged 47 participants. Data was collected through interviews, focus group discussions and document analysis.	a number of factors either facilitated or hindered the study schools' engagement in strategic planning: knowledge and awareness of strategic planning, leadership styles, financial resources, training and professional support	Stategic Plans should give direction on instrcutiinal management through influence on budgeting process	Particiipation of science tecahers in strategic planning to influence budgetary allocation for instructional resources.
Jason A. Grissom J A and Loeb S (2009	specific skills principals need to promote school success	This study draws on unique data combining survey responses from principals, assistant principals, teachers and parents with rich administrative data to identify which principal skills matter most for school outcomes.	a broad view of instructional leadership includes general organizational management skills as a key complement to the work of supporting curriculum and instruction	Role science teachers in budgeting for instructuional resources	Role of science teachers in instrutional management through bugeting process

Leithwood, K., & Jantzi, D. (2008).	understanding of the nature, causes and consequence of school leader efficacy, including indirect influences on student learning	Evidence for the study was provided by 96 principal and 2,764 teacher respondents to two separate surveys, along with student achievement data in language and math averaged over 3 years. Path analytic techniques were used to address the objectives for the study.	school leaders' collective efficacy was an important link between district conditions and both the conditions found in schools and their effects on student achievement	Principals perception on science teachers competency on financial management	Role of sceince teachers in budgeting process in enhancing utilization of instructional resources
Nagy F. M (2011)	Impact of Teacher Inclusion in Decision-Making on School Performance	Comparison influence of two principals, with two opposing management styles, had on a school's culture, students' performance using both qualitative and quantitative approaches	teachers' performance is directly proportional to the school performance and the results proved that involving teachers in school decision-making processes has a positive, lasting impact on school performance.	Involvement of science teachers in budgeting process and its influence on utilization of instrutional resources	Influence of science tecahers participation on budgetary allocation for instructional resources
Kumbi H J (2015):	Assessed the practices of teachers' participation in school decision-making in secondary schools of Arsi Zone.	To conduct this study, a descriptive survey design was employed A total of 231 respondents (119 teachers, 50 department heads, 20 unit leaders, 19 principals, 14 PTAs, and 9 secondary schools supervisors) were	teachers' level of participation in decision making was not to the needed standards. They participated most in issues related to curriculum and	Infliuence of participation of science teachers in budgetary allocation for instrcutional resources	Infleunce of sceince teachers partcicipation in budgeting process in enhancing utilization of instructional resources

		included in the study	instruction, and participated least in budget and income generation		
Kipkoech L C and Chesire S (2011):	Levels of Teachers' Involvement in Managerial Decision Making In Schools in Kenya	This study was conducted by cross-sectional survey design. Data were collected from a sample of 17 head teachers, 17 deputy head teachers, 51 head of departments and 51 class teachers. The instruments of data collection were: questionnaires, and interviews.	Findings indicate that teachers in secondary schools are involved in managerial decisions but at lower levels.	Participation of science teachers in budgeting process to infleunce learning outcomes	Role of science teachers in budgeting process to enhnace learning outcomes
Kung F, Huang and Cheng (2015)	Examination of the Relationships among Budget Emphasis, Budget Planning Models and Performance	A questionnaire survey was conducted and structural equation modeling was used to test the proposed models among the constructs and related hypotheses	budget planning models partially mediate the influence of budget emphasis on budget satisfaction	Budgeting approaches and their influence on instructional management	secondary schools financial policy influence on budgetary allocation for instructional resources
Mascitti-Miller E (2012)	examined practices that exist in the allocation of discretionary funds made by urban elementary principals.	used a matched sampling methodology to provide an analysis of resource allocation in four schools in Good Standing and four schools not in Good Standing	found that principals in Good Standing primarily use their discretionary spending in the strategy Create Individual Attention as the primary means to create a high performing school	Influenced of financial leadership style on budgetary allocation for instrutional resources	Infleucne of secondary schools financial managemnet policy on utilization of science instructional resources

2.8 Theoretical Framework

This study is based on Information Processing Theory (IPT). Atkinson and Shriffin the proponents of IPT proposed a model of memory in late 1960s presenting a sequential method of input-processing-output (Barkley, 2006). The basic idea of Information Processing Theory is that the human mind is like a computer or information processor, in that it receives input, processes, and delivers output. Utilization of instructional resources enables learners to gather information as input through senses and expected learning outcome is a behavioral response equated to output. Information processing as a model for human thinking is part of the resurgence of cognitive perspectives of learning sciences. According to Ajileye (2006), connectionist model proposed by Rumelhart and McClelland supported this by stating that information is stored simultaneously in different areas of the brain, and connected as a network.

In adopting IPT, consideration is that instructional resources utilization enables leaners to make several connections during science learning process into a single piece of information ease of retrieval (Isola, 2010). Utilization of instructional resources enables learners to actively input, process, and store information. In this regard instructional resources provide the hardware of cognitive processing resulting in science learning. Further, Masingila and Gathumbi (2012) asserted that IPT supports inquiry based learning which enhances learner's participation during science instruction through sequential phases of cognition. In this study the focus was on how appropriate utilization of instructional resources would enhance learners' participation and enable science teachers to employ multiple approaches during science instruction purposely for

sequential phases of cognition. Through application of inquiry based learning approaches learners' derived investigative knowledge through appropriate utilization of instructional resources. Supporting this position Miles (2010) argued that investment in inquiry based instruction results in active learning involving meaningful construction of knowledge, rather than passively acquiring facts from a teacher. Construction of knowledge is enhanced through effective utilization of instructional resources during learning sciences in class.

Information processing theory has been developed and broadened over the years and has been applied to systems beyond the individual, including families and business organizations. IPT has been used to describe business organizational behavior through presentation of a model on how effective and ineffective business strategies are developed (Drake & Fabozzi 2010). A key business strategy is budgeting process in secondary schools. Budgeting process results in a budget as management control mechanism designed to promote the efficient use of resources and providing support for other critical functions within a secondary school. The extent to which any budget is successful is dependent on its acceptance and the attitudes of both secondary school principals and science teachers towards it. According to Robinson (2007), there are both technical and behavioural aspects to budgeting that can benefit all in secondary school if properly understood and co–ordinated. The behavioural component of budgeting focuses on the ability to achieve the technical aspect of through stakeholder participation. The management style, culture and attitude towards employees will determine the approach to budgeting within secondary school system.

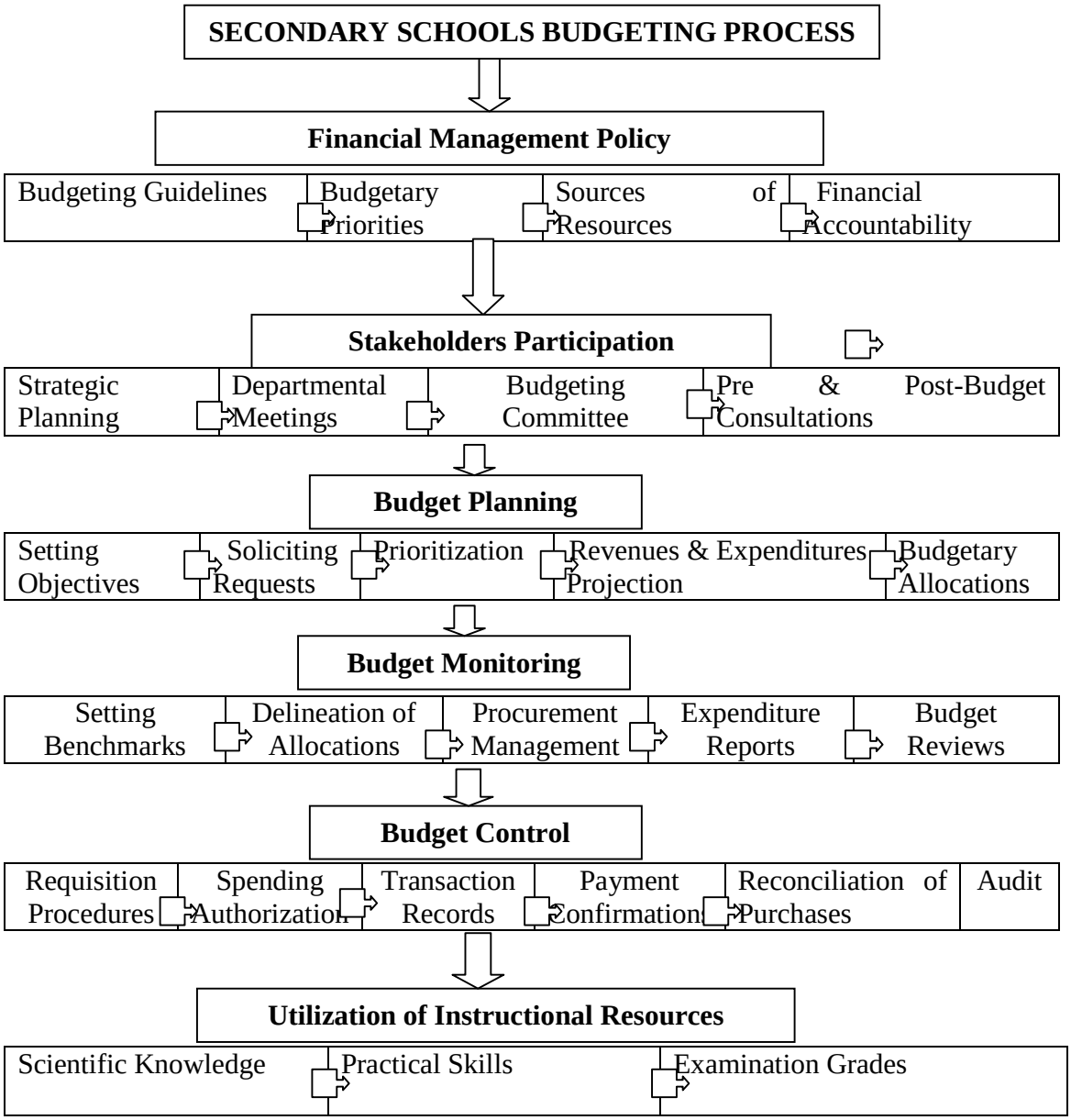
According to Drake and Fabozzi (2010), modern theories of organisational behaviour such as McGregor Theory X and Y; and Hertzberg Hygiene Factors recognize diversity in human behaviour. Specifically, McGregor in 1960s argued that employees' participation processes like budget planning make them internalize institutional objectives. In secondary schools participation of science teachers in budgeting process would make appreciate the role of financial planning in instructional management. This results in a higher response level in terms of budget monitoring and control since they contributed to the development process and greater efficiency in instructional planning process (Raghunandan Ramgulam and Raghunandan, 2015). This study considered human relations approach in participation of science teachers in secondary school budgeting process which when harnessed would results in better utilization of instructional resources.

Further, Lopez, William & Frances (2007) argued that IPT deals with purposeful utilization of information for decision making. This study focused on participation of science teachers in budgeting process and how it influences utilization of instructional resources was considered key in budgetary decisions making. This is because information plays a key role in budgetary decision making regarding funds allocation, monitoring and control for instructional resources. Budgeting process requires the availability of multiple sources of information to cope and IPT would be appropriately applied to its effects on availability of instructional resources (Chong & Johnson, 2007). Application of IPT came as a result of an increased consideration of information as a key critical contingency facing financial management in secondary schools. Ideally, information plays a key role

as an input in decision making process related to budgetary allocations for science instructional resources in secondary schools budgeting process.

In employing IPT, this study assumed that secondary schools that are structured to allow information flows to enable budgeting committees connect with various sections and departments. This would provide necessary information on budget requisitions for considerations among other things in an effort to ensure adequate budgetary allocation for instructional resources. Using IPT, this study suggested that effective instructional management would be achieved through appropriate handling of information as far as budgeting process is concerned (Chong & Johnson, 2007). Through use IPT an exploration was made on the role of information management budgeting process.

2.10 Conceptual Framework



As indicated in the conceptual framework, budgeting process involves identifying, measuring, recording, interpreting and communicating the results of economic activity; tracking income and expenses and using these measurements to answer specific questions about the financial status of secondary schools. Budgeting process is basically a system that provides quantitative information about financial management in an institution such as a secondary school. School instructional management is a system of guidelines, processes and activities that include school financial management policy, stakeholders' participation, budget planning, budget monitoring, and budget control, utilization and learning outcomes. Secondary school financial management policy provides a framework that guides the budgeting process including steps where stakeholders participate for the purpose of appropriate utilization of instructional resources.

The policy framework provides elements of financial accountability to ensure that sourcing of instructional resources is properly done from tendering to utilization in the classroom. School financial management is guided by policy objectives that determining budgeting priorities and how funds should be allocated. Resourcing any budget is limiting factor and should financial management policy should clearly outline possible sources of funds at the disposal of the institution to ensure appropriate utilization of instructional resources. Stakeholder participation is an essential component of financial management in general and budgeting process in particular in a school. Financial management policy is guided by schools strategic direction which outlines intended results to be achieved within a specific period and approaches to be employed.

All these are developed during strategic planning in which various stakeholders including parents, teachers, government departments' representative and civil society organizations (CSOs). As stakeholders in budgeting process teachers come up with budgetary requests at the departmental meeting guided by their schemes of work. Further, teachers are represented as stakeholders in budgeting committee by either heads of departments of school administration. As stakeholders, science teachers should take part in pre and post-budget consultations. For appropriate utilization of science instructional resources, adequate budgetary allocation is necessary. This is better realized with participation of science teaches in budget planning. Budget Planning as a component of school budgeting process starts with setting of budgetary objectives which should consider intended instructional goals of the institution for the particular academic period.

During planning, funding requests are solicited from various departments and sections as consideration for budgetary allocations. The budgeting committee then sits to consider various requests and prioritizes which ones should be considered for funding given available resources. After prioritization budget analysis is done in terms of revenues and expenditures projections to much available resource. Budgetary allocation marks the end of budgeting planning process and gives in to monitoring. Budget Monitoring Process starts with setting benchmarks then budgetary allocations for instructional resources are delineated per subjected per class. This makes it possible to monitor procurement of instructional resources starting from departmental planning every term. During departmental termly procurement planning meeting science teacher will delineate budgetary allocations for instructional resources and providing timelines for sourcing.

Effective monitoring culminates into termly expenditures reports from the departments and consolidated into single report for the school. Such reports are useful in making budgetary reviews every term and are key in ensuring controls are adhered to. Budget Control Mechanisms ensures prudent spending and has an effect adequacy of instructional resources. Such mechanisms include requisition procedures, approvals through spending authorizations, keeping transactions records, confirmations payments and reconciliation of purchases with budgetary allocations. As part of control mechanisms there should be routine auditing and an annual audit report. Appropriate school financial management policy outlining the role of various stakeholders and budgeting process guidelines for budget planning, budget monitoring and budget control mechanism will have an effect on adequacy and utilization of instructional resources for teaching science subjects and hence the learning outcomes.

Secondly, it was needful to determine the role of science teachers as stakeholders in strategic planning to set milestones in instructional management; in departmental meetings to prioritize on appropriate instructional resources; in budgeting committee for adequate representation of science instructional interests; and in both pre and post budgeting consultations for trade-ins and adjustments to ensure adequate budgetary allocations for instructional resources. A well-defined role of science teachers in school budgeting process is vital in planning phase to ensure adequate budgetary allocations are done for instructional resources. They should request what is to be included into the budget; playing a role in prioritization stage, revenue and expenditure projections to ensure fare budgetary allocations for instructional resources.

In general through budget monitoring decisions taken at the policy level are compared what takes place during implementation at the administrative level. This is intended to reduce wastage and avoidance of diversion of funds for reasonable assurance that successful instructional managements in secondary schools will take place. Specifically in this study, budget monitoring considered in terms of setting benchmarks, delineation of allocations, procurement management, and expenditure reports and budget reviews. Benchmarking for sourcing of instructional resources are set in terms of quality and quantity required. This is data driven budgeting where decisions are based on reliable data through performance indicators, which should clearly be defined during benchmarking. One such performance indicators should be specific type and quantity of science instructional resources needed in each class

Expenditure reports show budgeted revenues, actual revenue and costs to date and the variances between them. Effective expenditure reports would show how much of the budgetary allocations for instructional resources for science have been spent at a given time. Such information generated should represent faithfully the underlying transactions and would be useful in budget reviews and refocussing as far as instructional resources are concerned in a complete way. Budget control mechanisms include requisition procedures, spending authorization, transaction records, payments confirmation and reconciliation of purchases. Standardized requisition procedures ensures that information flow according to established guidelines and regulations in sourcing science institutional resources. It is essential, therefore, to ensure that there is a systematic authorization procedures for timely sourcing for instructional resources in secondary schools.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section covers how the data was sourced, processed and analyzed. It also contains information on research design employed in the study; target population from which information was obtained, sampling technique used to select the study sample, and research instruments used plus their validity and reliability

3.2 Research Design.

Study design is strategic plan setting out the outline and features of the work to be undertaken. As noted by McMillan and Schumacher (2006), research design is a plan for generating empirical evidence used for answering research questions. This research employed a correlations research designs to provide a statistical measure on the influence of budgeting process in utilization of instructional resources and its effect on learning achievements in science subjects in Kenyan secondary schools. Clarke (2007) noted that a correlation study is an analytical survey which describes the statistical measures of association or a relationship between two phenomena.

Correlation studies takes quantitative approach which comprises the identification of the research problem, definition of study variables, hypotheses stating, probability sampling from a defined population and measurement of variables using appropriate tools, checklists and forms. This study delved into the relationship between policy frameworks,

science teachers' participation in budgeting process in respect to budget planning, monitoring and control as far instructional management is concerned.

3.3 Target Population

Target population is the specific population about which information is desired in a research study. According to Fox and Bayat (2007), target population can be a group of individuals, events or objects with common characteristics that represents a whole or sum total of those involved in the study. The study target population was made up of principals, science teachers and form four students in secondary schools in Nairobi County. Specifically the study targeted public and privates schools that have been in existence for more than 10 years offering the national 8-4-4 curriculum. Within this categorization there are 6 national schools, 60 county schools and 66 private schools in Nairobi County. Teachers for biology, chemistry and physics according to information obtained from County Director of education are presented in Table 3.1

Table 3.1 Target Population

School Category	Number	Biology Teachers	Chemistry Teachers	Physics Teachers	Form 4 Boys	Form 4 Girls	Principals
National	6	33	41	28	1471	1023	6
County	60	249	275	234	6752	5437	60
Private	66	219	223	189	4583	4127	66
SubTotal		**501**	**539**	**451**	**12806**	**10587**	
Total	**132**	**Teachers**	**1491**		**Students**	**23393**	**132**

In six national secondary schools there are 33 biology, 41 chemistry and 28 physics teachers. County secondary schools have 249 biology, 275 chemistry and 234 physics

teachers. Private secondary schools have 219 biology, 223 chemistry and 189 physics teachers. Form four student in 2016 were 12,806 boys and 10,587 girls,

3.4 Sample and Sampling Procedure

According to Nieuwenhuis (2007), sampling in research involves selection of part of target population referred to as a sample. As a portion of target population, a study sample is used to provide empirical data for analysis to answer research questions. This study was a quantitative research and as noted by Leedy and Ormrod (2005) random sampling was presumed adequate in drawing a sample to represent the entire target population. In particular, the study employed stratified random, simple random and purposive sampling technique to obtain the sample. To ensure each category of schools was represented in the sample, stratified random sampling was used. This gave 2 national secondary schools out of 6, 15 county secondary schools out of 60 and 16 private secondary schools out of 66 in Nairobi County. Stratified random sampling was preferred because each category of secondary schools in Kenya vary considerably and helped to achieve the desired representation in the target population (Leedy & Ormrod, 2005).

From selected schools, the principal and 3 science teachers were purposely sampled based on the fact that they were considered knowledgeable and informative about either budgeting process or utilization of instructional resources. This was in line with Babbie (2008) assertion that purposive sampling is ideal in selecting information rich individuals for a study. This was necessary for in-depth understanding of the relationship between budgeting process and utilization of science instructional resources in secondary schools.

Secondly, the use of purposive sample was informed by Bless, Higson-Smith and Kagee (2006) assertion that it is necessary to choose a sample on the basis of what is considered key in terms of information required however subjective it may be. From each school, 6 form four students were randomly selected and care taken to ensure that each stream was equally represented in the sample. This was key in ensuring that each form four student had equal chance to be selected (Cohen, Raudenbush & Ball 2003). In total 33 principals, 99 science teachers and 198 students participated in the study totalling to a sample of 330 as indicated in Table 3.2

Table 3.2: Study Sample

School Category	Number	Sampled Schools	Study Sample	
National	6	2	Principals	2
			Science Teachers	6
			Students	12
County	60	15	Principals	15
			Science Teachers	45
			Students	90
Private	66	16	Principals	16
			Science Teachers	48
			Students	96
TOTAL	**132**	**33**		**330**

3.5 Research Instruments

The study used questionnaires for Science teachers, and form four students and interview schedule for school principals. Document analysis schedule was used to obtain data from

Nairobi county director's office and Kenya National Examination Council (KNEC) regarding performance in KCSE.

3.5.1 Questionnaires for Science Teachers, Bursar and Form Four Students

Questionnaires are instruments designed for collecting information about knowledge, attitudes, beliefs and feelings of individuals (Amin 2005). The questionnaire for the science teachers was divided into four sections with first seeking to provide personal and school background information of the respondents. The second section was on their role they play in budgeting process for sourcing of instructional resources in likert scale. The third section sought to their feelings on utilization of instructional resources. The fourth section focused on learning outcomes. Questionnaire for form four students was divided into three sections with first part seeking information on their personal background, second on utilization of instructional resources.

3.5.2 Interview Schedules for Principals

Qualitative research most prominently depends on interviews as the major tool in data collection. Interviews enable researchers to assess respondents' perceptions and meanings of situations and their construction of reality. Supporting this position Punch (2009) noted that using interviews is a powerful means of understanding people in any research study or fact finding exercise. Further, Greef (2005) acknowledged the power of interviews as a two way conversation which enables researchers to learn about the ideas, beliefs, views, options and behaviour of the participants. In learning about a participant beliefs`, views and behaviors, Nieuwenhuis (2007) acknowledged that interviews provide

rich descriptive data which enable researchers to understand participant's construction of knowledge and social reality.

This study used interviews to source information from the principals. Interviews were used to understand principals' role in formulation of school financial policy, their views on budgeting for instructional resources and stakeholders involved in the process (Amin, 2005). Using interviews was a complementary way for gathering information in this study as a means of determining secondary schools principals understanding of the key issues in budgeting process (Punch, 2009). The interview schedule had both closed and open- ended questions; and was used for purposes of triangulation. The interviews were recorded and transcribed verbatim

3.5.3 Document Analysis Schedules

Document analysis is an approach that allows for analysis of information already documented (Gray, 2009). These can either be official, semi-official or non-official documents. Documented information are official or non-official, however as noted by McMillan and Schumacher (2006) they can be journals, memos, working papers, minutes of meetings, proposals and internal reports. Such documents according to Punch, (2009), describe functions and how various people define their institutions; official chain of command and gives a picture of leadership style and values. Both internal official documents and those for external communication according to Punch (2009) are key educational and social research source of data. Documents in this study were examination results records for the last five years and as well as documents on education policies. The

purpose of using document analysis in this study was meant to eliminate bias from other sources of data. It was also aimed at providing information for policy analysis from both international and national instruments that should inform attainment of quality education as a human right. In general, it was necessary for relating legal and policy framework to secondary schools budgeting process and utilization of instructional as a basis for quality education

3.6 Validity of the instruments

Validity of instruments is a measure of the extent it purports to provide the desired information (Amin, 2005). Further, Kothari (2011), considered validity as a measure of how much the differences found using an instrument reflect exact variation among participants or what is being tested. To ensure validity, the draft instruments were scrutinized by supervisors who are experts and are knowledgeable in research. Whatever comments on the structure and design plus recommendations raised were used to improve the instruments. Secondly, instruments were subjected to appraisal using Content Validity Index (CVI). When computed, a CVI greater than 0.7 was considered as adequate for the study.

$$\text{CVI} = \frac{\textit{Agreed items by both judges as suitable}}{\textit{Total number of items in the questionnaire}}$$

The CVI was 0.79 for the teachers' questionnaire and 0.72 for the students' questionnaire. The CVI obtained for the tools were greater than 0.7. These were considered as valid. After analyzing the results of the pilot study, some responses were

amended and irrelevant items were discarded and replaced with more useful, relevant and logical ones which elicited the required responses.

3.7 Reliability of the Instruments

Reliability of instruments is concerned with whether to very minimum level approximately same result can be obtained when it is used to measure something twice or more. Simply put by Kothari, (2011) reliability is how consistent is an instrument in give results. Further, Amin (2005) considered reliability as the extent an instrument will produce consistent scores from measuring group of individuals repeatedly under the same conditions (Amin, 2005). In this study reliability of instruments was established through piloting in four secondary schools outside the sample. Consistency was computed using Cronbachs alpha coefficient and α above 0.8 were considered reliable (Punch, 2009).

- Cronbach's basic equation for alpha

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\Sigma Vi}{Vtest}\right)$$

  - n = number of questions
  - Vi = variance of scores on each question
  - Vtest = total variance of overall scores on the entire test

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After carrying out the pilot study involving four secondary schools in Nairobi County and Statistical Package for Social Sciences (SSPS) was used to generate Cronbachs alpha

coefficient for questionnaires for science teachers and form four students. These were presented as in Table 3.3

Table 3.3: Reliability Test for Questionnaire

Respondents	Number of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Science Teachers	28	.931	.932
Students	19	.927	.929
Principals	13	.904	.906

3.8 Data Analysis Techniques

Quantitative and qualitative data were both collected in this study. Quantitative data was cleaned and coded before being entered into SPSS version 23. Coding is assigning numerals to answers to enable responses to be put into a limited number of categories or classes. This was done as recommended by Kothari (2011) date should be coded as a way of classify answers to questions into meaningful categories for easy analysis. Information collected was edited through examination of raw data to detect errors and omissions and to correct where possible. Quantitative data was analyzed using frequency tables and by establishing statistical relationships between variables including modeling of both categorical and quantifiable data. The research design used a quantitative approach to yield numerical and quantifiable data, which was used to generate frequency distributions and percentages from the school and personal background information. Frequencies were accompanied with cross tabulations to establish any association between the student

population, number of streams, school type, school category, school age and perceived availability and adequacy of instructional resources. Results are presented in tables.

In testing of the hypothesis Principal Components Analysis (PCA) was used to derive scores for each of the independent variables. In PCA, one wishes to extract from a set of *p* variables a reduced set of *m* components or factors that accounts for most of the variance in the *p* variables. The aim of PCA is to reduce a set of *p* variables to a set of *m* underlying superordinate dimensions. These underlying factors are inferred from the correlations among the *p* variables. Each factor is estimated as a weighted sum of the *p* variables. The i^{th} factor is thus

$$F_i = W_{i1}X_1 + W_{i2}X_2 + \ldots + W_{ip}X_p$$

One may also express each of the *p* variables as a linear combination of the *m* factors,

$$X_j = A_{1j}F_1 + A_{2j}F_2 + \ldots + A_{mj}F_m + U_j$$

Where U_j is the variance that is unique to variable *j*, variance that cannot be explained by any of the common factors. Bartlett's test of sphericity and the Kaiser-MeyerOlkin measure of sampling adequacy were used to determine the factoriability of the matrices. The results value of Bartlett's test of sphericity were significant at $p<0.05$. Qualitative data was analyzed through data categorization and recognition of relationships. Respondents were given codes depending on their categories as data generated by interview schedules were transcribed. Analysis for information obtained from the interviews involved the use of qualitative content analysis. In this regard, content was reduced, condensed and grouped (Nieuwenhuis, 2007). Using pre-set coding frame,

content analysis was done within framework of budgeting process factors, namely school financial management policy, stakeholder participation, budget planning, budget monitoring and budget control. The data was worked through and transcriptions re-read to check key insights that had emerged. Further categories, patterns and themes were linked to research questions, identified and described. This allowed information analysis, consensus discussions and recognition of emerging differences, all of which were considered determination of final study findings.

3.9 Ethical Considerations

This study recognised that each human being has value in himself or herself, and that this value must inform all interaction between people. Copy of permission was obtained from the National Councils for Science, Technology and Innovation (NACOSTI) and an introductory letter from University of Nairobi were received by all respondents. This was meant to inform the respondents on purpose of the study as recommended by Mestry (2006). In this regard a brief explanation of the aim of the study was given when appointments were being made for data collection and respondents were assured on anonymity and confidentiality. The assurance involved information as to why they were involved in the study and that participation was voluntary and were free to withdraw from the research study at any time (Silverman, 2010). Respondents' were given an assurance on their rights to privacy and protection from any psychological or physical harm. To guarantee confidentiality a consent form was developed and signed by participants.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This study focussed on the effects of budgeting process on the utilization of science instructional resources in secondary schools in Nairobi County, Kenya. It correlated budgeting process with utilization of instructional resources in sciences. Information was collected from principals, bursars, science teachers and form four students in 29 secondary schools in Nairobi County.

4.2 Response Rate

Response rate is sample members are included in the final data set (Bless, Higson-Smith & Kagee, 2006). Response rate is worked from the number of respondents who were interviewed or filled questionnaires as a fraction of the entire sample multiplied by 100%. Table 4.1 presents the response rate

Table 4.1: Response Rate

Category	Sample	Response	Percentage
Principals	33	29	87.88
Science Teachers	99	83	83.83
Form Four Students	198	171	86.37
Total	**330**	**290**	**87.88**

From Table 4.1 a sample made up of 29 principals, 83 science teachers and 171 form four students totalling 290 out of the sampled 330 participated in the study. This gave a response rate of 87.88%. Specifically, 29 (87.88%) principals were interviewed, 83

(83.83%) science teachers and 171 (86.37%) of 198 students participated in the study. A response rate of 87.88% is adequate for data analysis in a study

4.3 Background of the Schools

In Kenya secondary schools are either public or private. Public secondary schools are government funded and managed by BOM in collaboration with Parents Teachers Associations (PTA). Private schools are established and managed by individuals, profit making enterprises, foundations, trusts, religious bodies, non-governmental organizations, communities and cooperative societies (Gok 2002). In this study the sample was made up of 2 national, 15 county and 16 private schools. Out of 33 sampled secondary schools data was collected from 29 and results presented in Table 4.2

Table 4.2: Schools Background Information

Variable		Frequency	Percentage
Number of Teachers	11-20	5	17.2
	21-30	14	48.30
	31-40	7	24.105
	More than 40	3	10.30
Number of Streams	1-2	3	10.30
	3-4	17	58.60
	5-6	6	20.70
	7-8	2	6.90
	More than 8	1	3.40
Type	Boys Boarding	3	10.30
	Girls Boarding	8	27.60
	Boys Day	3	10.30
	Girls Day	1	3.40
	Mixed Day	11	37.90
	Mixed Boarding	3	10.30
Category	National	2	6.90
	County	15	51.72
	Private	12	41.38

From Table 4.2, 2(6.70%) of the sampled secondary schools were national secondary schools, 15(51.72%) were county secondary schools and 12(41.38%) were private secondary schools. In terms of both financial leadership and instructional management the expectation as far as learning outcomes in science subject is the same in both private and public secondary schools. Secondly, as much as private secondary schools are run as profit making enterprises their core mandate if effective science instruction for national development. Thirdly, section 52 of Basic Education Act No 14, 2013, demands that private secondary schools establish necessary educational and governance structures including instructional management (Republic of Kenya 2013). Therefore private secondary school should budget for instructional resources and ensure they are effectively utilized.

In Kenya, secondary schools are either for girls, boys or mixed schools with either boarding facilities or not. This gives six types of secondary schools namely; boys' boarding, girls' boarding, boys' day, girls' day, mixed day and mixed boarding secondary schools. The findings in Table 4.2 indicated that mixed day secondary schools were 11(37.90%), girls' boarding schools were 8(27.60%), boys' boarding, boys' day and mixed boarding secondary schools were both 3(10.30%) and girls' day schools were 1(3.40%). Whichever the type of school, the need for adequate budgetary allocation has a significance on appropriate utilization of science instructional resources.

According Oyier, Odundo, Ganira and Wangui (2015) number of streams per class determine complexity of financial and instructional management in secondary schools in terms of coordination. In this study and as indicated in Table 4.2 secondary schools with

three or four streams were 17(58.60%), those with five or six streams were 6(20.70%), those with one or two were 3(10.30%), those with seven or eight were 2(6.90%) while those with more than 8 streams were 1(3.40%). The fact that majority of secondary schools in Nairobi County have between three to six streams is an indication that appropriate approach in budgeting of instructional resources is necessary..

In Kenya secondary schools, average enrollment is 45 students per class. This however can go as high as 55 students per class in some cases. Secondary schools in Nairobi County with four or more streams could have a population of 500 students. This high enrolment according to Oyier et al (2015) necessitates an effective information management system for the purpose of budgeting process to ensure proper utilization of instructional resources. Further, Glen (2007) asserted that budgeting process in secondary schools needs access to multiple sources of information to allow organizing and managing funds according to the population of students and staffing. As opined by Oyier et al (2015), access to multiple sources of information may necessitate ICT integrated platform for coordination of budgeting process. .

The number of teachers in a secondary school plays a pivotal role in instructional management from selection of subjects, decision on necessary instructional resources to evaluation of learning outcomes. Findings in Table 4.2 indicates that secondary schools with 21-30 teachers were 14(48.30%), those with 31-40 teachers were 7(24.10%), those with 11-20 teachers were 5(17.20%) while those with more than 40 teachers were 3(10.30%). From these findings it is clear that only 17.20% (5) secondary schools in Nairobi County have less than 20 teachers. The number of teachers in secondary schools

in Nairobi County necessitates decentralize management as departments to enable effective participation of science teacher budgeting process. This echoes Wadesago (2012) recommendation that participatory decision making process is key in efforts to improve learning outcomes in secondary schools.

Making science teachers to be part of the schools' management systems with a role in budgeting process would optimize utilization of instructional resources. Enhancing utilization should be realized through representation in budgeting committee where budgetary allocations are prioritized. According to De Grauwe et al. (2011) argument that science teachers' involvement in budgeting process is a vital aspect of decision-making towards attainment of quality instructions in secondary schools. Further, it echoes Naidoo (2005) argument that the participation of teachers in the day-to-day financial management in budgeting process is key in effective utilization of science instructional in secondary schools.

Effective science instructions require adequate number of teachers in secondary schools handling biology, chemistry and physics. According to EFA Global Monitoring Report of 2015, due to financial constraints, it has not been possible for Kenya to meet international standard as far as student-teacher ratio is concerned (UNESCO, 2015).

Table 4.3: Teachers in Different School Category

Number of Teachers	11-20	21-30	31-40	More than 40	Total
National	0	0	1	1	2
County	2	9	2	2	15
Private	5	5	2	0	12
Total	**7**	**14**	**5**	**3**	**29**

From Table 4.3, one of the two national secondary schools had more than 40 teachers aa well as two of out of 15 county ones had more than 40 teachers. Among county secondary schools, two had more than 31-40 teachers. Two private secondary schools had 31-40 teachers. Nine county secondary schools as well as five private secondary schools had 21-30 teachers. Finally, in five private and two county secondary schools in Nairobi County there were 11-20 teachers. These findings are an indication that national secondary schools are better staffed compared to county and private secondary schools in Nairobi County. The number of teachers could also depend on student enrollment in secondary schools. As already mentioned the larger the staff the more advisable it is for secondary schools to have decentralized management that would encourage participation of science teachers in budgetary allocation decisions for instructional resources.

Number of streams per class is factor of student enrollment and in turn influences the number of teachers in a secondary school. Table 4.4 shows a cross-tabulation of number of teachers and streams in secondary schools in Nairobi County.

Table 4.4: Teachers and Streams in Secondary Schools

No of streams	Number of Teachers				Total
	11-20	21-30	31-40	More than 40	
1-2	2	1	0	0	**3**
3-4	5	11	1	0	**17**
5-6	0	2	2	2	**6**
7-8	0	0	2	0	**2**
>8	0	0	0	1	**1**
Total	**7**	**14**	**5**	**3**	**29**

From Table 4.4, majority of secondary schools with 11-20 teachers had 3 or 4 streams and the same is with schools having 21-30 teachers. This is an indication that as much as the number of streams in a secondary school should determine staffing, in this study the

findings are contrary. Staffing is not only a factor of number of streams in secondary schools, but also depends on how broad the curriculum is in these schools are. Naidoo (2005) asserts that secondary schools which offer more variety of subjects need more teachers irrespective to students' enrollment. Budgetary decision marking in secondary schools with many streams and many subjects requires a decentralized information management system.

4.4 Demographic Data

Demographic characteristics would provide a clear understanding of influence of participants on final findings. Covered in this section are gender of principals, Science teachers and four form students, ages of principals and science teachers, their qualifications, experience and teaching subjects.

4.4.1 Principals

Instructional management improves the quality of education in schools. According to Teachers Service Commission (1998) the prime role of the principals is to ensure smooth instructional management. Primarily the way secondary schools are managed influence quality of education through instructional process. In this study, a total of 29 secondary school principals were interviewed. As noted study by Wagithunu et al (2014) a critical analysis of personal backgrounds with regard to their competence in financial management and accountability is vital in instructional management. As leading professionals in secondary schools, principals determine budgetary allocation for instructional resources. Ages of principals aside, they are expected to provide leadership and direction in financial and instructional management. This study sought to establish

secondary schools' gender, qualifications, age, experience and duration in current stations as presented in Table 4.5

Table 4.5: Characteristics of Principals

Variable		Frequency	Percentage
Gender	Male	16	55.2
	Female	13	44.8
Qualifications	Graduate	18	62.1
	Post-Graduate	11	37.9
Age	31-40 years	5	17.2
	41-50 years	19	65.5
	Over 50 years	5	17.2
Experience	6-10years	5	17.2
	11-15years	18	62.1
	16-20years	3	10.2
	Over 20years	3	10.2
Duration in Current Station	5 years and below	9	31.1
	6-10years	19	65.5
	11-15years	1	3.4

The findings in Table 4.5 shows that male principals were 16 (55.2%) and females were 13 (44.8%). This is an indication that in educational sector, gender equity in schools management is a reality. Secondary school principals' irrespective of gender possess authority legitimized by formal positions according to policy and legal frameworks regulating education sector in Kenya. As much as principals are accountable to both BOM and MOEST, they have overall leadership and management responsibility of secondary schools (Bush, 2004).

The findings in Table 4.5 on age shows that 19 (65.5%) out of 29 principals interviewed fall between 41-50years old. Those who were above 50years of age were 5 (17.2%), while those between 31-40 years old were 5 (17.2%). This is an indication that most

principals are aged below 50 years old and became teachers when ICT related technologies part of secondary schools management. This echoes assertion of Oyier, Odundo, Ganira & Wangui (2015) from a study on the role of ICT in management of private secondary schools states that principals who are 50 years old or less and came into leadership position within the period computers. Budgeting for instructional resources in terms of information management during budget planning, monitoring and controls. ICT knowledge would enhance capacities of secondary schools principals in financial and instructional managements (Lemelin, 2005). Budgeting process would benefit from ICT through information management in budget planning, monitoring and control.

Effectiveness of principals in information management during budgeting for instructional resources is dependant to academic qualifications and experience. According to Table 4.5 all the principals interviewed had university education of which 18 (62.10%) were graduates while 11 (37.90%) had post-graduate qualifications. This is an indication that secondary schools principals have the required academic qualifications to manage budgeting process for science instructional resources. In sampling the assumptions made was that all principals managing secondary schools as required by TSC must have studied education as a discipline with training on financial management and instructional management. Secondary school principals with postgraduate qualification in education have an added advantage in better financial and instructional management.

On further qualification on financial management it was established that some of principals and especially from public secondary schools had additional financial management training from Kenya Education Management Institute (KEMI). Principals with post-graduate qualifications in educational administration as well as those teaching business studies also have additional knowledge in financial management. Interviews also revealed that some principals were trained financial experts either in accountancy or book-keeping at different levels. Table 4.6 shows principals financial management qualifications

Table 4.6: Principals' Financial Management Qualifications

Category	M. Ed	Accounts	Business Education	KEMI	None	Total
National	1	0	0	1	0	2
County	6	0	2	6	1	15
Private	1	2	3	0	6	12
Total	8	2	5	7	7	29

Table 4.6 shows that out of 17 public secondary school principals seven were trained by KEMI, seven had post-graduate qualifications in educational administration, two had Bachelor of education in Business studies. . Table 4.6 indicates that one principal in private secondary schools had post-graduate qualifications in educational administration, two had accountancy training, three Bachelor of Education degree in Business studies and six lacked additional knowledge in financial management. This is an indication that majority of secondary principals in Nairobi County have additional knowledge in financial management necessary in budgeting for science instructional resources compared to counterparts in private sector. Additional knowledge in financial management is necessary in budgeting process and Wagithunu et al (2014)

recommendations that secondary school principals should continuously boost their professional development through training.

According to Basic Education Act of 2013, principals sit BOM as secretaries and are chief accounting officers responsible for control and use of school funds (Republic of Kenya 2013). This responsibility requires competency in financial management gained through experience in leadership. The findings in Table 4.5 shows that a majority 18 (62.1%) of secondary school principals had worked as teachers for 11-15years giving them vast experience in instructional leadership and financial management. Table 4.5 also shows that secondary school principals with 16-20 years teaching experience were 3(10.2%), while those with more than 20 years were 3(10.2%); 6-10 years were 5(17.20%) and none of the secondary school principals had worked less than 6years.

Experience aside, the length a principal have stayed in a station will determine the ease with which he or she will come up with financial management policies, implement and evaluate them to assess their effectiveness. Table 4.5 shows that 19 (65.5%) of the principals had stayed in current stations for 6-10years, 9 (31.10%) for 5 or less years, while 1(3.4%) have been there for 11-15years. As noted by Joubert and Bray (2007) it requires about five years for a strategic plan to be implemented and evaluated to determine its impact in institutional management. With majority having stayed in their current stations for more than five years, principals in secondary schools in Nairobi County should have the necessary policies in place to manage, organize, and provide leadership in financial and instructional management.

4.4.2 Characteristics of Science Teachers

A qualified secondary school science teacher holds a teaching certificate, licensed by the TSC and has at least a diploma in education from an institution recognized by MOEST and qualified to teach Biology, Chemistry or Physics. In this study, at least one science teacher for any of the three subjects were asked to fill questionnaires in the sampled schools. Analysis of results obtained from 83 science teachers who participated is presented in Table 4.7

Table 4.7: Characteristics of Science Teachers

Variable		Frequency	Percentage
Gender	Male	39	47.00%
	Female	44	53.00%
Qualifications	Graduate	75	90.50%
	Post-Graduate	8	9.50%
Age	31-40 years	40	48.20%
	41-50 years	28	33.70%
	Over 50 years	11	13.30%
Experience	5 years and below	2	2.40%
	6-10years	34	41.00%
	11-15years	23	27.70%
	16-20years	11	13.30%
	Over 20years	13	15.70%
Duration in Current Station	5 years and below	38	45.70%
	6-10years	38	45.70%
	11-15years	5	6.20%
	16-20 years	1	1.20%
	Over 20years	1	1.20%
Teaching Subject	Biology	28	33.70%
	Physics	28	33.70%
	Chemistry	27	32.50%

According to consideration Olembo, Wanga and Karugu (1992) and De Grauwe et al (2011), teachers' involvement budgeting process for budgetary allocations for instructional resources is a vital aspect of decision-making that is not dictated by ones' gender. Out of 83 science teachers who fully filled questionnaires, as shown on Table 4.7

females science teachers were 44(53.00%), while males science teachers were 39(47.00%). This is an indication that both female and male teachers participated in science instructional process in the study area. Gender of science teachers does not influence budgetary decision for instructional resources as well as their utilization. As noted by Burusic, Babarovic and Seric (2012) influence of teachers' and learners' gender interactions on learning achievements is insignificant and would not influence utilization of science instructional resources.

Effectiveness of science teachers' participation in instructional planning is competence derived from professional training. Table 4.7 indicates that all science teachers were graduates and 8(9.50%) of them had post graduate qualifications. Graduate science teachers in secondary schools mostly join the profession at an average age of 25 years (Yala & Wanjohi, 2011). Findings in Table 4.7 indicates that a majority 40(48.20%) of science teachers were aged between 31-40 years old; 28 (33.70%) were 41-50years old, 11(13.30%) above 50years old and only 4(4.50%) were below 30years. This is an indication that science teachers in secondary schools in Nairobi County are professionals with 5 to 15 years of experience with necessary competency to participate in budgeting for science instructional resources.

Experience enhances competency for effective participation in budgetary decision making for science instructional resources. According to Song, Hans van der Bij and Mathieu (2005) teacher experiences have a significant influence on utilization of instructional resources and learning outcomes. On experience of science teachers in

secondary schools in Nairobi County as indicated in Table 4.7 showed that 34(41.0%) have 6-10 years of experience, 23(27.70%) had 11-15years, 13(15.70%) had over 50years, 11(13.30%) had 16-20years while 2(2.40%) 5 or less years. This is an indication that more than half science teachers had teaching experience necessary for effective participation in budgetary decision making and utilization of instructional resources. This concurs with a study conducted by Somech (2002) which asserted that 5 years is adequate experience for teacher to effectively participate in management related decision making.

Work experience of Science teachers determine the ease with which they understand school financial and instructional management policies, their implementation mechanisms and monitoring frameworks. From Table 4.7, 38(45.70%) of science teachers had served in their schools for 5years or less, another 38(45.70%) for 6-10years, 5(6.20%) for 11-15years, 1(1.20%) for 16-20 years and 1(1.20%) for over 20 years. This was an indication that 45(54.30%) out of 83 science teachers had more than five years in their respective schools. The length science teachers have stayed in respective schools, their academic qualifications and overall experience would have a positive significance in participation budgetary decision making. The study finding is an indication that in secondary schools in Nairobi County, science teachers have the required competency to participate in budgeting for instructional resources.

In secondary schools, science teachers can teach biology, chemistry or physics with another subject. Table 4.7 shows that 28 (33.7%) were teachers of physics, 28(33.70%) were teachers of chemistry and 27(32.50%) were teachers of biology. Science teachers as

instructional managers play a role in planning for class instruction. Planning for science instructions is decisions making process that start at writing scheme of work and includes taking part in school budgeting process which has an influence in utilization of instructional resources during teaching and learning process (Olembo, Wanga & Karugu 1992).

4.4.3 Characteristics of Learners

Learning of Science nurtures learners for equitable opportunities in life beyond secondary education. Science teachers need to take into consideration learners demographic characteristics when planning for class instructions in biology, chemistry and physics According to Kurgat (2008), effective science instruction needs to take into consideration of multidimensional cultural world of the learner. Further, Mukhwana (2013) in applying, multidimensional principle advanced by Kurgat (2008) asserted that instructional resources and pedagogical approaches are key when planning science instructions in secondary schools. This study recognized this and looked at gender and subject choice may influence learning science in secondary schools as presented in Table 4.8

Table 4.8: Students Characteristics

Variable		Frequency	Percentage
Gender	Male	84	49.1
	Female	87	50.9
Teaching	All three sciences	59	34.3
Subject	Biology and Chemistry	55	31.98
	Physics and Chemistry	57	33,1

The general perception is that male students perform better in science than their female counterparts, however according to Amadalo, Ocholla and Memba (2012) the differences between gender related abilities in science are much more subtle and complex. Further, Abubakar and Dokubo (2011), noted that gender of learners has no significant influence

on their performance in sciences. Findings in Table 4.8 shown that out of 171 form four students who took part in this study 87(50.90%) were females and 84(49.10%) were males.

In Kenya, KCSE marks formal end secondary school education and learners are graded by consideration of two science subjects (KNEC, 2006). Therefore, leaners are expected to take at least two science subjects in preparation to KCSE. According to Wambugu & Changeiywo (2008), many secondary schools take chemistry as compulsory science subjects which must be taken by all the candidates and learners are expected to take it plus either Biology or Physics. Alternatively in some schools all the three science subjects are compulsory. The findings in Table 4.8 indicate that the learners were equally represented in three categories depending on choices of science subjects. Those taking the three sciences were 59(34.30%), biology and chemistry 55(31.98%), and physics and chemistry 57(33.14%). Whichever science subjects' combination a learner takes, appropriate utilization of instruction resources will be significant in determining learning outcomes.

4.5 Budgeting for Instructional Resources

Budgeting process in secondary schools is a decision making process that requires a policy framework defining information management connecting all stakeholders and their roles. According to Kaguri, Njati and Thiaine (2014), the purpose of school budgeting process involves planning, formulating objectives, coming up with priorities; scheduling activities; setting up accountability measures; controlling, monitoring and analyzing expenditure; and evaluating financial performance. In this study, science teachers were

asked to indicate on a five-likert scale the extent to which a number of issues correctly describe budgeting process in their school (where 1= strongly disagree, 2= Disagree, 3= Uncertain, 4= Agree and 5= Strongly Disagree). The descriptive statistic presented in tables in this section was interpreted using percentages to indicate score for budgeting process practices

4.5.1 Effects of Policy Framework on Budgeting for Instructional Resources

The basis of quality instruction is domesticated within Constitution of Kenya (2010) which considers education as a human right and Vision 2030 emphasizes the role of science education in sustainable national development. The Constitution of Kenya (2010) and other related international and national legal instruments view quality instruction as aimed towards fulfilment of education as right (Chaudhury et al, 2006). School financial management policy should take care of provisions of these legal instruments in guiding budgeting process as s way towards quality science instructions. Existence of financial management policy in secondary schools ensures adequate budgetary allocation for instructional resources to be utilized in learning biology, chemistry and physics.

4.5.1.1 Financial Management Policy in Secondary Schools

A secondary school financial management policy aims at facilitating learning outcomes in sciences by providing a framework to guide budgetary allocations for instructional resources. According to Kahavizakiriza et al (2015), financial management policy provides secondary schools leadership with a basis that guides instructional management through adequate budgetary allocations. This will support continuous improvements in science learning through appropriate utilization instructional resources at all level in

secondary schools. In this study, science teachers were asked about existence of a financial management policy informing budgeting process in their respective secondary schools. Analysis of science teachers' responses according to Table 4.9

Table 4.9: Science Teachers Knowledge of Financial Management Policy

	Disagree	Uncertain	Agree	Total
National	0	0	6	6
County	0	12	29	41
Private	0	10	26	36
Total	0	22 (26.50%)	61 (74.5%)	83

Findings in Table 4.9 indicated that 61(74.5%) of science teachers in secondary schools in Nairobi County agreed and 22(26.50%) were uncertain of their schools having a financial management policy. Uncertainty by 22(26.50%) of science teachers could be attributed to secondary schools leadership approach. Leadership approach determines how much exposure science teacher would have as far as financial management would be in secondary schools. This confirmed assertions of Motsamai et al (2011) and Robinson et al (2008) that variation in financial leadership approaches exist in secondary schools, hence different levels of science teachers' involvement. Further, majority of science teacher noted that it is the work of the principal and the BOM to come school financial management policy. However, two teachers said in their institution they are involved;

T1440: Through staff meeting, all teachers are involved, BOM, PTA

T3009: We are engaged in departmental budgeting

This is an indication that in some secondary schools in Nairobi County, science teachers are involved in decision making leading to budgetary allocations for instructional

resources. This was echoed by majority of principals in during interviews who acknowledged that their schools have financial management policy. As much as it could be true, this explains a possibility of error of social desirability in secondary schools financial management.

Table 4.9, further showed there is likely more likelihood for national schools to have financial management policy because all six science teachers agreed of its existence in institutions. For county schools, out of 41 science teachers 12 were uncertain and 19 agreed that their schools had financial management policy. The trend in county secondary schools was similar to that of private secondary schools where 10 science teachers were uncertain, 26 agreed. The results are indication that all categories of secondary schools in Nairobi County have financial management policies. However, there is variations that would influence utilization of instructional resources through budgeting process in secondary schools. According to Wagithunu et al (2015) that there is lack of professionalism in the management of school finances and principals' attitude towards managing schools resources that could make many science teachers be unaware of such documents. However, these findings can attributed to the fact that secondary schools in Kenya are served with ministerial guidelines on funds management, but individual schools are at liberty to organize and manage their funds depending on the nature of their leadership.

4.5.1.2 Budgeting Guidelines for Science Instructional Resources

Financial management policy provides for economic planning and utilization of school funds for realization of instructional goals. Specifically, school financial management policy guides budgeting process and is a framework for overseeing, directing, conducting, regulating and controlling science instructions. Budgeting guidelines as noted by Jebet and Naserian (2003) are intended to provide school leadership with a basis for ensuring availability of adequate instructional resources for learning biology, chemistry and physics. As a guide to budgeting process, school financial management policy is based on MOEST policies and procedures, rules, regulation and guidelines on how best the school funds can be planned for effective instructional management. Results on financial management as guideline in budgeting for instructional resources are presented in Table 4.10

Table 4.10: Science Teachers Knowledge of Budgeting Guidelines

School category	Disagree	Uncertain	Agree	Total
National	0	1	5	6
County	4	19	18	41
Private	2	19	15	36
Total	**6(7.20%)**	**39(47.00%)**	**38(45.7%)**	**83**

Findings in Table 4.10 showed that 39(47%) of science teachers were uncertain and 6(7.20%) disagreed, slightly more than half of those who responded. This was an indication that in about a half of secondary schools in Nairobi County, financial management policy did not have objectives guiding budgetary allocation for science instructional resources. The results also showed an indication that many science teachers could not have been aware of existence of a financial management policy in their

institutions. This therefore implies that science teachers in a number of secondary schools in Nairobi were not involved in financial issues in respective institutions. Involvement of science teachers in financial management would enhance utilization of instructional resources through adequate budgetary allocations.

These findings are in tandem with assertion by Motsamai et al (2011) that many secondary schools principals do not involve science teachers in decisions leading to budgetary allocation decisions for instructional resources. It can therefore be argued from these findings that as much financial management policies could be influencing budgetary allocation for science instructional resources, but this dependent on leadership approaches in differences secondary schools. However, as suggested by Asiabaka (2008) governments need to put in place a policy framework on minimum standards for budgetary allocation to improve utilization of instructional resources. Quality science instruction is vital for national development and according to Okumbe (2007) it achievable instructional resources are made available through a policy guided budgeting process in secondary schools.

4.5.1.3 Sources of Funds for Science Instructional Resources

Secondary education in Kenya is financed with funds from different sources. According to Otieno and Colclough (2009), public secondary schools are financed by the government and levies paid by parents. Alternatively other sources of financing secondary education include income generating projects, donations from private sources and special grants for specific activities by government. (KIPPRA, 2007). However,

increased enrollment in secondary schools requires increased mobilization of resources to supplement government funding and fees paid by parents in budgeting for science instructional resources. Responses on secondary schools financial resources are presented in Table 4.11

Table 4.11: Science Teachers Knowledge of School Financial Resources

School category	Disagree	Uncertain	Agree	Total
National	1	3	2	**6**
County	2	17	22	**41**
Private	7	16	13	**36**
Total	**10(12.0%)**	**36(43.40%)**	**37(44.6%)**	**83**

Findings in Table 4.11 indicated 36(43.4%) of science teachers were uncertain, 37(44.6%) agreed and 10(12.0 %) disagreed. The fact that more than half of science teachers were either uncertain or disagreed was an indication of limited involvement of science teachers in financial management issues. Secondly, results in Table 4.11 showed that acknowledging the use of alternative funding sources in budgetary allocation decision for instructional resources vary among science teachers in different categories of secondary schools in Nairobi County.

Results in Table 4.11 indicated that science teachers in public secondary schools were more certain of alternative funding sources for instructional resources. Specifically 41 science teachers from county schools, 22 (53.66%) agreed, 17(41.46%) were uncertain and two disagreed. Among six science teachers from national schools, 2(33.33%) agreed, 3(50.0%) were uncertain and 1(16.7%) disagreed. From private secondary schools, out of 36 science teachers 13 (36.11%) agreed, 16 (44.44%) were uncertain and 7(19.44%)

disagreed. This is an indication that national secondary school fund instructional resources from a number of sources compared to county and private counterparts in Nairobi. As indicated by Obunya (2008) more established secondary schools mobilize resources to supplement government funding and fees to boost instructional resources demands. Secondly, the results suggested that in private secondary schools science teachers are less involved in budgeting for instructional resources

From secondary school principals it was noted that funds provided through FDSE for instructional management was not adequate. To fill the gap most principals use fees paid by parents to supplement the need for instructional resources. This according to some schools principals would involve borrowing from other voter heads or charging parents extra.

> *P3: The money allocated is not enough and the gap is filled by borrowing from other vote heads*
> *P13: Not adequate, and we fill the gap by charging parents and also cutting on some expenditure*

The responses from the principals showed the need for school managements to explore alternative sources of financing budgetary allocations for science instructional resources in order to realize educational goals. This supports KIM (2010) assertion that secondary schools depends on different sources of funds to supplement government funding and fees paid by parents in ensuring that instructional resources are made available and effectively utilized with the aim of good learning outcomes. As suggested by Assie-Lumumba (2005) secondary school managements need to be innovative to strategies on

financing options for making instructional resources adequate for realization of educational goals.

4.5.1.4 Standardized Procedures and Science Instructional Resources

The mandate of the education sector in national development is derived from the Constitution of Kenya (2010), which provides overall guidelines for management of public resources. These guidelines are compatible with the demands of the Kenya Vision 2030 and are found Education Act 2013. Public Finance Management Act 2015, and Constitution of Kenya (2010). These constitutional provisions are translated into financial management policies to enable institutions and staff to concentrate scarce resources on instructional priorities. Findings on standardized budget procedures are presented in Table 4.12.

Table 4.12: Science Teachers Acknowledgement of Standardized Procedures

School category	Disagree	Uncertain	Agree	Total
National	1	1	4	**6**
County	2	17	22	**41**
Private	8	15	13	**36**
Total	**11(13.20%)**	**33 (39.80%)**	**39(47.0%)**	**83**

Findings in Table 4.12 indicated that out of 83 science teachers, 47.0% (39) agreed, 39.8% (33) were uncertain and 13.20% (11) disagreed that standardized procedures exist in secondary schools. The fact that 47.0% (39) agreed was an indication that in slightly less than half of secondary schools in Nairobi County had financial management policies providing standardized procedures were available. Having standardized procedures

according to Oplatka (2004) was an indication that secondary schools had rules, regulation and guidelines for planning and utilization of instructional management.

Further, Table 4.12 revealed existence of standardized procedure in most public institutions than private counterparts. Specifically, 26 science teachers from public secondary schools out of 47 who responded to the questionnaires agreed compared with the 12 out 36 from private category. This variation could be explained by the findings of Okoth (2003) who asserted that in private secondary school budgeting process does not involve science teachers comparable to public counterparts and may not link financial leadership and instructional management.

4.5.1.5 Financial Accountability in Science Instructional Management

Financial accountability involves accounting and procurement controls, performance measurement and auditing. To enhance accountability, school financial management policy should provide a control mechanism that would ensure optimal use of available resources for quality instructional results. Control mechanisms are tenets of Public Finance Management Act 2012 (Republic of Kenya, 2012), other Public Finance legislation enacted pursuant to the provisions of Chapter 12 of the Constitution of Kenya (2010) including the Strategy for Public Finance Management Reforms in Kenya 2013 – 2018 (Republic of Kenya, 2013a). Reinforcement of school financial management policy with the statutory provisions would significantly influence utilization of instructional resources through adequate budgetary allocation. It will also enhance accountability and

transparency from budgetary allocation to utilization of instructional resources. (Chetambve & Sakwa, 2013)

Science teachers' responses on schools financial management policies provisions on guidelines for accountability in sourcing of instructional resources are presented in Table 4.13

Table 4.13: Science Teachers Acknowledgement of Financial Accountability

School category	Disagree	Uncertain	Agree	Total
National	1	2	3	**6**
County	3	17	21	**41**
Private	0	15	21	**36**
Total	**4(4.80%)**	**34(41.00%)**	**45 (54.2%)**	**83**

Findings in Table 4.13 showed that 54.2% (45) of science teachers agreed, 41.00% (34) were uncertain and 4.80% (4) disagreed on existence of accountability provisions in secondary schools in Nairobi County. The results were an indication that 54.2% of secondary schools in Nairobi County had accountability provision in their financial management policies. However, high number of uncertainty or disagreement suggested that secondary schools could run into the possibility of misappropriation of funds in some secondary schools. Lack of accountability is characterized by misappropriation and improper control mechanism in secondary schools (Mestry, 2006). It is essential that such secondary schools set up systems of control and accountability to effectively manage instructional process.

Table 4.13 show that out of 36 science teachers from private secondary schools 21 agreed and 15 were uncertain on the existence of accountability provisions. From county

secondary schools, 11 science teachers agreed, 17 were uncertain and three disagreed on existence of accountability provisions. From national secondary schools, three science teachers agreed, two were uncertain and one disagreed on existence of accountability provisions. This was an indication that private secondary schools were more accountable and this could significantly influence utilization of instructional resources.

However, it is worth noting that a good working relationship between the principal and staff influence science teachers perceptions on accountability in instructional management. As noted by Mngoma (2009), such good working relation makes science teachers to acknowledge schools' leadership efforts defining mechanisms for accounting and controls. Having accountability provisions in schools is vital a step towards achieving instructional goals. In general, as noted by Mestry and Bisschoff (2009), it is prudent to share information of financial management to ensure that expenditure is directed towards achieving instructional goals. Through shared information platform, science teachers will be part of systems of control and accounting to ensure adequacy and effective utilization of science instructional resources.

4.5.2 Stakeholder Participation in Budgeting for Instructional Resources

Stakeholders in school financial management and in particularly budgeting process for instructional resources are BOM, academic and administrative staff, students and parents (Jongbloed, Enders & Salerno, 2008). This study focused on the role of science teachers in budgeting process that would assist in overseeing, directing, conducting, regulating and controlling in instructional management of biology, chemistry and physics in schools

(Okumbe, 2007). The extent to which science teachers are involved in the budgeting process for sourcing of instructional resources in secondary schools in Kenya was considered in terms of their participation in strategic planning, departmental meetings, and budgeting committee and in pre and post-budget consultations.

4.5.2.1 Strategic Planning and Science Instructional Resources

A strategic plan is a roadmap showing directions where a secondary schools heading towards achieving educational goals. The strategic directions should have milestones clearly indicating set of actions to be undertaken towards realization of instructional goals in particular (Mulwa, 2008). Milestones in instructional management would include sourcing and making available resources for teaching and learning for effective science instructions. In this study the focus was the extent to which science teachers take part in school strategic planning where objectives informing budgetary allocations for instructional resources are set. Findings on teachers' role in strategic planning are presented in Table 4.14

Table 4.14: Science Teachers Participation in Strategic Planning

School category	Disagree	Uncertain	Agree	Total
National	1	3	2	**6**
County	3	22	16	**41**
Private	6	21	9	**36**
Total	**10 (12.00%)**	**46 (55.40%)**	**27 (32.50%)**	**83**

Findings in Table 4.14 indicates that 55.40% (46) of science teachers were uncertain if schools' strategic plans have objectives informing budgetary allocations for instructional resources, 32.50% (27) agreed and 12.00% (10) disagreed. This is an indication that majority of secondary schools in Nairobi County could not be having strategic plans and

if they have either science teachers did not have an opportunity of seeing them or are not aware of their existence. It is also an indication that some secondary schools in Nairobi County have not fully embraced strategic plans as instructional management tools as suggested by Kipkoech and Chesire (2011). Linking strategic planning with budgeting process through clear milestones would significantly influence utilization of science instructional resources if teachers are involved at all steps in management decision (Adaire, 2010)

Table 4.14 shows analysis of science teachers' involvement in terms of category secondary schools. Out of six science teachers from national secondary schools only two agreed, in county category out of 41 science teachers 16 agreed, while among private secondary schools nine out 36 science teachers said they take part in school strategic planning where objectives informing budgetary allocations for instructional resources are set.. This translated into 33.3% approval for national secondary schools, 39% for county schools and 25% for private schools. This is an indication of low participation of science teachers in strategic planning in Nairobi county secondary schools. As noted by Jones and George (2009), strategic planning requires involvement of all stakeholders concerned with implementation. This in turn creates a challenge for secondary schools in Nairobi County to build a mental bridge towards attainment of educational goals by linking financial leadership and budgetary allocations for instructional resources

4.5.2.2 Role of Departmental Meetings in Budgeting Process

Science teachers could participate in school budgeting process through departmental meetings. Departmental meetings provide a platform for cooperative planning to identify instructional needs for science teaching and learning resources. During such meetings departmental budgets are drawn after deliberations touching on subject requirements per class for forwarding to the school budgeting committee. However, the extent to which this is possible depends on individual secondary schools' approach to financial leadership. Findings on departmental meeting are presented in Table 4.15

Table 4.15: Science Teachers Participation in Departmental Meetings

School category	Disagree	Uncertain	Agree	Total
National	0	1	5	**6**
County	5	14	22	**41**
Private	5	13	18	**36**
Total	**10(12.0%)**	**28(33.70%)**	**45(54.2%)**	**83**

Findings in Table 4.15 indicate that 54.2% (45) agreed, 33.70% (28) were uncertain and 12.0% (10) disagreed. This was indication that half of science teachers agreed or strongly agreed that departmental meetings had a significance on budgetary allocations for instructional resources in secondary schools in Nairobi County. This is an indication that in of secondary schools in Nairobi County there is less consideration of departmental meetings inputs in budgeting process for instructional resources. This echoes Sharp and Walker (2005) sentiments that in secondary schools departmental meetings are rare and if held are insignificant in terms of influencing budgetary allocations decisions for

instructional resources. This could include absence of participatory leadership, minimal trust, and lack of budgeting knowledge to absence of motivation of teachers.

Further, according to secondary schools categories Table 4.15, out six science teachers from national secondary schools in Nairobi County five agreed, 19 science teachers out of 44 agreed, 14 uncertain and five disagreeing. In private category out of 36 science teachers 18 agreed, 13 uncertain and five disagreeing. This gave an indication that in national secondary schools departmental meetings had more significance in decisions making regarding budgetary allocations for instructional resources. However, in all categories there was significant participation of science teachers in school budgeting process through departmental meetings and this would influence utilization of science instructional resources in secondary schools in Nairobi County.

4.5.2.3 Science Teachers Participation in Budgeting Committee

Departmental meetings provides earlier scrutiny of instructional resources needs per subject in each class. As noted by Wadesago (2011) teachers' participation in school decision making should not end at departmental meetings but should be carried to the budgeting committee. Including science teachers in secondary schools budgeting committee is mandatory for the attainment of better learning outcomes. In budgeting committees, head of science or a representative teacher and those from other departments receive departmental priorities which are then brought together to facilitate the drawing of the final school budget.

On representation of science teachers in secondary school budgeting committee, the response obtained is presented in Table 4.16

Table 4.16: Science Teachers Participation in Budgeting Committee

School category	Disagree	Uncertain	Agree	Total
National	0	3	3	**6**
County	7	13	21	**41**
Private	7	16	13	**36**
Total	**14(16.9%)**	**32(38.6%)**	**37(44.6%)**	**83**

Findings in Table 4.16 indicated that majority of science teachers either were uncertain, disagreed or strongly disagreed on their participation in budgeting committee. Out of 83 science teachers 44.6% (37) agreed, 38.60% (32) were uncertain and 16.9% (14) disagreed that they were represented in the budgeting committee. These results revealed a greater variation in science teachers' participation in decision on budgetary allocations for instructional resources at budgeting committee level in Nairobi County secondary schools. This reflected Kumbi (2015) study in Ethiopia which ascertained that some teachers had a greater participation in school management decision making while others are not involved. Variation in level of participation of science teachers in management decision making has a significant influence on availability and utilization of instructional resources in secondary schools in Nairobi County. These findings are in concurrence with Mokoena (2011) suggestion that science teachers and other stakeholders need to be given opportunity to play defined and legitimate roles in school budgeting process.

In terms of school categories as presented in Table 4.16, results showed that about half of science teachers from public secondary schools agreed that they were represented in

school budgeting committee compared to about a third in private schools. However, the fact that 38.60% (32) were uncertain and 16.9% (14) disagreed that they were represented in budgeting committee was a perceptive variation. This is attributed to different approaches secondary schools leadership have in financial and instructional management. This would significantly influence availability and utilization of science instructional resources.

4.5.2.4 Pre-Budget Consultations for Science Instructional Resources

One way of ensuring adequate budgetary allocations for instructional resources is pre-budget consultations between budgeting committee, science department and individual subject teacher. This requires innovative, interactive and dynamic leadership with budgeting process that would ensure consensus building among stakeholders (Drah, 2011). It requires secondary schools principals as instructional managers to create a participatory environment in budgeting process to ensure adequate budgetary allocations for instructional resources. In seeking to establish the role of science teachers in pre-budget consultations the findings are presented in Table 4.17

Table 4.17: Science Teachers Participation in Pre Budgeting Consolations

School category	Disagree	Uncertain	Agree	Total
National	1	2	3	**6**
County	8	14	19	**41**
Private	5	17	14	**36**
Total	**14(16.9%)**	**33 (39.8%)**	**36 (43.3%)**	**83**

Findings in Table 4.17 showed that out of 83 science teachers who responded 39.80% (33) were uncertain, 43.3% (36) agreed and 16.9% (14) disagreed. The large number of

uncertain science teachers resonates with Sharp and Walker (2005) and Kipkoech and Chesire (2011) assertion that teachers in secondary schools managerial abilities remain unrecognized and unmet because some principals take up most of the managerial decisions. Perception of secondary school principals influence utilization of instructional resources. This is determined by the level of participation of science teachers in decision making in secondary schools.

Failure in some secondary schools to have pre-budget consultations could also be viewed as lack of professionalism in the management of finances and principals' attitude towards management of resources that make them not involve staff in decision making concerning finances (Wagithunu et al, 2015). It could also be pegged on individual teachers' attitude. According to Kumbi (2015) some teachers are not interested in matters beyond classroom affairs unknowingly that they are part of school instructional management. In conclusion, pre-budget consultations can be explains in terms secondary schools principals' perceptions on their staff ability in financial management and science teachers' attitude towards their role beyond instructional process.

4.5.2.5 Post-Budget Consultations for Science Instructional Resources

After budgetary allocations have been made by the budgeting committee recognition of expertise of science teachers in their respective subject and teaching methodology though post budget consultations is vital (Kosgei & Kimengi, 2007). This will enable necessary adjustments to ensure adequate allocation for instructional resources for sciences are provides for before the budget adoption given amount of funds at disposal for the school

within the year. In seeking to establish the existence of post-budget consultations from science teachers in secondary schools within Nairobi County as presented in Table 4.18

Table 4.18: Science Teachers Participation in Post Budget Consultations

School category	Disagree	Uncertain	Agree	Total
National	2	0	4	**6**
County	6	12	23	**41**
Private	4	16	16	**36**
Total	**12(14.4%)**	**28(33.7%)**	**43(53.8%)**	**83**

Findings presented in Table 4.18 indicated that a majority of 53.8% (43) of science teachers agreed, 33.70% (28) were uncertain, 14.4% (12) disagreed. This was an indication that post-budget consultations between budgeting committee and science department to reconcile pre-budget understandings with actual allocations takes place in secondary schools in Nairobi County. This corrects what Wanzare (2006) noted about most secondary schools that little consideration is given to instructional resources during budgeting process. With active post-budget consultations, whatever budgetary allocation, necessary adjustments could be made to ensure appropriate utilization of science instructional resources.

From this study findings it is possible to argue that some secondary school principals understand and appreciate the involvement of teachers in budgeting process as way towards improved utilization of science instructional resources. However, this differs with categories of secondary schools in Nairobi County. For example out of six science teachers from national secondary schools four agreed and two disagreed that post-budget consultations between budgeting committee and science department take place in their institutions. In county secondary schools, out of 41 science teachers 23 agreed, 12 were

uncertain and six disagreed. In private schools, out of 36 science teachers 16 agreed, 16 were uncertain and four disagreed.

Above analysis showed that two-thirds of national secondary schools science teachers acknowledged existence of post-budget consultations, about a half in the county category and less than half from the private counterparts. These findings indicate that more science teachers in public secondary schools than their private counterparts confirmed that post-budget consultations between budgeting committee and science department. These findings were an indication of the extent science teachers are in involved in financial management issues and particularly post-budget consultation is more evident in public schools. This variation in post-budget consultations between budgeting committee and science department among other factors could have a negative significance on learning achievements in science subject in private secondary schools than in public ones.

In general stakeholder participation in budgeting for science instructional resources, science teacher acknowledged that they play a role together with others. This includes HODs, dean of studies and laboratory assistants.

> *T1853: Each and every teacher is fully aware how to prepare requisition for his/her needs in terms of subjects which are submitted through HOD*

From analysis of interview results, secondary school principals acknowledged that there are pre and post budget consultations in their institutions. However, majority were not

very clear on how both pre and post budget consultations take place. A few who were slightly clear stated as follow:-

> *P3. Pre-budget consultations are on what are available and what is required*
>
> *P14: Science department presents budget and gets feedback through supplies*
>
> *P18: Before the budget is drawn, the science teachers come up with a preliminary one while throughout the expenditure period consultations take place.*

4.5.3 Budget Planning Process for Science Instructional Resources

Budget planning ensures that adequate allocation for instructional resources for effective learning in secondary schools. In carrying out budget planning, secondary schools need to have a budget preparation timetable setting process in clearly defined stages to be undertaken to ensure adequate and balanced budgetary allocations are done (Kruger, 2005). Ideally, planning of school finances is a dynamic process that should be marked by regular stages ending up with balanced budget. According Lemelin (2005), budget planning involves setting objectives, determining resources, soliciting requests, determining projections and cost to enhance effective management of school resources to realize educational goals. In agreements with both Lemelin (2005) and Kruger (2005) this study summarized that budget planning starts with setting objectives through, soliciting requests, prioritization, projections and ends with actual budgetary allocations.

4.5.3.1 Setting Budget Objective for Science Instructional Resources

Strategic considerations in financial management influence the way money is allocated at in secondary schools to enable realization of instructional goals. These strategic considerations should be formulated into objectives to define how resource in school systems are best be distributed, utilised and managed to optimise outputs, encourage successful instructional management and promote continuous improvement (Cole & Kelly, 2011). This study sought from science teachers' possibilities of secondary schools in Nairobi County having formulated budgeting objectives that take science instructional resources in consideration and results presented in Table 4.19.

Table 4.19: Existence of Budgeting Objectives

School category	Disagree	Uncertain	Agree	Total
National	0	2	4	**6**
County	4	15	22	**41**
Private	8	12	16	**36**
Total	**12(14.4%)**	**29(35.4%)**	**42(50.6%)**	**83**

Findings in Table 4.19, indicated that a majority of 41.00% (34) of science teachers agreed with another 9.60% (8) strongly agreeing that secondary schools in Nairobi County have budgeting objectives that take in consideration science instructional resources. The other half of science teachers in secondary schools in Nairobi County were either uncertain, disagreed or strongly disagreed. This can be attributed to financial leadership approach in secondary schools which defines strategic engagement on budgeting process for science instructional resources. It also showed that in some secondary schools there is a more inclusive and participatory approach as noted by Reeves (2008) in linking strategic planning and financial management policy for the purpose of enhancing utilization of science instructional resources. Variation n

Further, Table 4.19 also showed variation of science teachers' responses in terms of secondary schools by category. Out of six science teachers from national secondary schools four agreed and two were uncertain of existence of budgeting objectives in their institutions. From county secondary schools 22 science teachers agreed, 15 were uncertain and four disagreed. From private secondary schools 16 science teachers agreed, 12 were uncertain and eight disagreed. These results were more varied however there was an indication that in public secondary schools were more likely to have budgeting objectives that guide resources allocations as far science instruction was concerned than in their private counterparts. It also suggest that some secondary schools in Nairobi County could be concentrating more on physical resources ignoring instructional resources (Rumelt, 2011)

4.5.3.2 Budgetary Requests for Science Instructional Resources

During budget planning, requests should come from all departments and sections within secondary school. This should generally take the form of written communication, but could be a presentation to the budgeting committee at one of its meetings (Ojiambo, 2010). This study sought to establish whether science teachers base their budgetary request schemes of work and results presented in Table 4.20.

Table 4.20: Soliciting Budgetary Requests for Science Instructional Resources

School category	Disagree	Uncertain	Agree	Total
National	2	3	1	**6**
County	7	9	25	**41**
Private	9	13	14	**36**
Total	**18(21.7%)**	**25(30.1%)**	**40(48.2%)**	**83**

Findings in Table 4.20, indicates that out of 83 science teachers 48.2% (40) agreed that they normally place their budgetary request based on their schemes of work. Secondly, 30.10% (25) of science teachers were uncertain and 21.7% (18) disagreed. The fact that slightly more than half of science teachers were uncertain, disagreed or strongly disagreed was an indication that schemes of work were written and submitted either to the head of science department or to the principal and beyond that science teachers do not know what happens in secondary schools in Nairobi County. This suggests that secondary schools principals hide issues from teachers as far as financial management is concerned. These findings therefore echo Kipkoech and Chesire (2011), assertion that teachers in secondary schools managerial abilities remain unrecognized and unmet merely because principals take up most of the managerial decisions.

In terms of science teachers' responses based on categories of their institutions, Table 4.20 showed that out of six science teachers from national's secondary schools only one agreed that budgetary request are based on schemes of work, 3 were uncertain and two disagreed. From county secondary schools, out of 41 county schools science teachers, 25 agreed, nine were uncertain and seven disagreed. From private secondary schools, out of 36 science teachers, 14 agreed, 13 were uncertain and nine disagreed. This suggests that most science teachers in county secondary schools base their budgetary request on schemes of work as compared to their counterparts in private schools. This findings concurs Wanzare (2006) that most private schools do not appropriately consider instructional resources during budgeting process.

4.5.3.3 Prioritization in Budgeting for Science Instructional Resources

Financial management policy in a school is crucial in outlining not only sources of funds required, but also a prioritization system to avoid wastage and misappropriation. To realize this, Clarke (2007), suggested that budgeting process need to be guided by identifying priorities. The reason for this is that institutional financing availability might not meet all budgetary requirements needed to achieve instructional gaols. Prioritisation in instructional management should involve science teachers in decisions on appropriate instructional resources that must be availed for the best possible learning outcomes. This study sought participation of science teachers during budgeting committee meeting when prioritization on list of instructional resources and finding presented in Table 4.21

Table 4.21: Science Teachers Participation Budget Prioritization

School category	Disagree	Uncertain	Agree	Total
National	1	3	2	**6**
County	7	12	22	**41**
Private	7	16	13	**36**
Total	**15(18.10%)**	**31(37.30%)**	**37(44.5%)**	**83**

Findings in Table 4.21 indicates that out of 83 science teachers, 44.4%(37) agreed, 37.30% (31) were uncertain and 18.10% (15) disagreed that they were represented in budgeting committee during prioritization on instructional resources list. Given that more than half of science teachers who responded either were uncertain or disagreed is an indication of big variation in their responses. Representation of science teachers in budging committee enables them to understand different budgetary trade-offs that would require review of instructional resources requirement to ensure appropriate utilization. However, as already mentioned this was not true in all secondary schools in Nairobi

County because the level of involvement of science teachers in prioritization varies. For example, Table 4.21 showed that out of six science teachers from national secondary schools, only two agreed; from county secondary schools out of 41 science teachers, 22 agreed; while from private secondary schools, out of 36 science teachers three agreed. This suggested that science teachers in county secondary schools were more likely to be represented during prioritization than both national and private counterparts. However, as suggested by Wadesango (2011) representation in budgeting committee is determined by financial leadership approach of an institution.

4.5.3.4 Budgetary Projection for Science Instructional Resources

Once all sections and departments have had an opportunity to meet with the budgeting committee or have their material received by budgeting committee, the information is assembled into budget alternatives. This involves holding multiple sessions to deliberate the proposed initiatives from various departments and sections focussing on prioritization and aligning them to financial commitment of the projected resources. Secondly, needs assessment is done taking into consideration the account records of the previous year which could be used to make projection of the next year's budget estimates. Further in their deliberations, the budgeting committee uses available information such as and not limited to school enrolment or student population. Generally, budgeting in secondary schools is done based on the unit cost per student, number staff and sources of incomes.

Given their complex and dynamic nature, extensive sources of revenue, and multiple items of expense, secondary schools must have a strategy to efficiently manage resources

to achieve instructional goals. This study sought to establish through science teachers the existence of projecting revenues and expenditures system that link financial policy objective of instructional resources and results presented in Table 4.22

Table 4.22: Science Teachers Participation in Budgetary Projections

School category	Disagree	Uncertain	Agree	Total
National	0	2	4	**6**
County	2	20	19	**41**
Private	6	12	18	**36**
Total	**8(9.6%)**	**34(41.00%)**	**41(49.4%)**	**83**

Findings in Table 4.22 indicate that 49.4 % (41) of science teachers agreed, 41.00% (34) were uncertain and 9.6% (8) disagreed. This was an indication that half of secondary schools in Nairobi County had a system for projecting revenues and expenditures that links financial management policy objective to science instructional resources. The fact that half of the science teachers were either uncertain, disagreed or strongly disagreed suggested that in some secondary schools, financial leadership are less open and lacking focus as far as instructional management is concerned (Drah, 2011). Further, Table 29 showed that out of six science teachers from national secondary schools, four agreed; from county category, out of 41, 19 agreed, while from private category 18 agreed out of 36 that a system for revenue and expenditure projection exist in their institutions. These findings confirmed that about half of science teachers in Nairobi county secondary schools acknowledged existence of a system of revenue and expenditure projection that link policy objective to budgetary allocation for instructional resources. This concurred with Codrington (2004) assertion that adoption of strategic projections influences budgetary.

4.5.3.5 Budgetary Allocations for Science Instructional Resources

There is pressure on secondary schools to efficiently and effectively manage budgeting process to ensure effective instructional management while responding to other demand for limited resources. This pressure does not make it easy for budgeting processes to tie allocations and expenditures to strategic goals as earlier noted by (Mulwa, 2005). In allocating funds the budgeting committee should base their considerations by specifying what has been given per activities as requested by various sections and departments. This study sought to establish if allocations for instructional resources are specified in secondary school budget and results presented in Table 4.23

Table 4.23: Science Instructional Resources Budgetary Allocations in School Budget

School category	Disagree	Uncertain	Agree	Total
National	2	2	2	**6**
County	9	10	22	**41**
Private	1	21	14	**36**
Total	**12(14.4%)**	**33(39.8%)**	**38(45.8%)**	**83**

Findings in Table 4.23 shows that 45.8% (38) of science teachers strongly agreed, 39.80% (33) were uncertain, 14.4% (12) disagreed that the allocation for science instructional resources are specified in budgets of secondary schools in Nairobi County. This is an indication that delineation of allocation for instructional resources in budgets of 39.80% (33) of secondary schools in Nairobi County. The fact that majority of Science teachers were uncertain, disagreed or strongly disagreed could be attributed to lack of information as suggested by Chetambve and Sakwa (2013) that secondary schools lack transparency in financial issue. Lack of information on budgetary allocations in secondary schools in Nairobi County confirms position held in Transparency

International (2010) integrity report on Kenyan education sector which indicated that there is limited disclosure regarding finances for effective instructional management in secondary schools. It also echoes Mestry (2006) who reported that teachers have varied perceptions as far as how school principals manage their funds for the purposes of making instructional resources because of lack of adequate information from management.

Varied perceptions of Science teachers on budgetary allocation for Science instructional resources in secondary school is evidently presented. Table 4.23 shows that out of 6 science teachers from national secondary schools, two agreed, two were uncertain and two disagreed that schools budgets allocations for instructional resources are delineated. In county category, out of 41 science teachers in county secondary schools 22 agreed, 10 were uncertain and nine disagreed. From private category out of 36 science teachers 14 agreed, 21 were uncertain and one disagreed. These findings indicate that financial budgets in most county secondary schools have allocations for instructional resources specified and that there was more uncertainty among science teachers from private secondary on specified. High uncertainty among science teachers from private schools can be as result of less government control (Wango & Gatere, 2013).

On how budgetary allocation for science instructional resources is arrived at, science teachers gave varied responses. However, one common thing was Science teachers play a role through their department either through a meeting or simply forwarding individual

requests to the HOD. This was confirmed by their responses to open ended questions in the questionnaire given below.

> *T1853: The members meet as individual subject teachers and set out their respective requisitions and do a balance if necessary thereby avoiding it on time*
>
> *T1440: Through science departmental meeting then passed to HOD meeting then to principal for forwarding to the BOM*
>
> *T3009: the HOD call a meeting where each subject instructional needs are addressed and the priorities made depending on the urgency*

All secondary school principals agreed that during school budgeting process is there a specific allocation for instructional resources. However, few were clear on whether budgetary allocations for instructional resources done per specific subject or for all sciences. For example one noted that:-

a. *P1: Common things are done for all subjects while specific materials are done for each subject.*

The response is an indication that budgetary allocations for instructional resources are given as a block in most secondary schools in Nairobi County.

4.3.4 Budget Monitoring Process for Science Instructional Resources

Budget monitoring in secondary schools involves the collection and analysis of data to helps in racking of activities to determine achievement of instructional goals and to make necessary changes aimed at improving learning outcome in order to realizes better learning outcomes, managing budget implementation should be a flexible process to take care of emerging issues since there should be adequate instructional resources throughout learning period in secondary schools (Kruger, 2005). Ideally, financial management for the purposes of maintaining effective instructions in schools is about keeping track of source of funds and how they are spent. Keeping track of budgetary allocations is the essence of effective budget monitoring for instructional management (Gogo, 2002). Specifically, budget monitoring was considered in this study in terms of setting benchmarks, delineation of allocations, procurement management, expenditure reports and budget reviews.

4.5.4.1 Benchmarks in Budget Monitoring for Science Instructional Resources

Whenever there are deviations from budgetary allocation regarding expenditure on instructional resources questions are raised about the credibility of the budgeting process, budget monitoring process and the reliability of management information system (Walter, 2009)..

Efforts to establish through science teachers the existence of benchmarking in sourcing of science instructional resources in secondary schools in Nairobi County gave results presented in Table 4.24

Table 4.24: Science Teachers Participation in Benchmarking

School category	Disagree	Uncertain	Agree	Total
National	1	4	1	**6**
County	4	15	22	**41**
Private	11	13	12	**36**
Total	**16(19.3%)**	**32(38.6%)**	**35(42.1%)**	**83**

Findings in Table 4.24, indicate that out of 83 science teachers 38.60% (32) were uncertain, 42.1% (35) agreed and 19.3% (16) disagreed that benchmarking is done in their institutions. Benchmarking in sourcing for instructional resources should involve science teachers, because this empowers them on quality and quantity control. Involving science teachers in benchmarking as suggested by Somekh, (2008) is an element of distributed leadership. These findings indicate that majority of secondary schools principals in Nairobi County do not practice distributed leadership.

Lack of distributed leadership was evident because 38.60% (32) of science teachers were uncertain 19.3% (16) disagreed that benchmarking is done in their institutions, an indication that principals do not focus on mutual assistance and division of work. This is contrary to Ojiambo (2010) assertion that budget monitoring is better done when benchmarks are set in collaboration with Science teachers for effective utilization of instructional resources. This in turn will ensure that budgetary allocations are spent without wastage or diversion for the purpose of successful instructional managements in secondary schools. Further, as noted by Ajuoga et al (2010) setting benchmarks is critical

in assessing utilization of instructional resources against budgetary allocation in secondary schools.

4.5.4.2 Delineation of Budgetary Allocations for Science Instructional Resources

Utilization of science instructional resources in secondary schools should focus on learners in all classes to achieve better learning outcomes in biology, chemistry and physics. To achieve this performance-based budgeting is practiced to make it possible for effective syllabus coverage at all levels. Performance-based budgeting is data driven where decisions are based on reliable information through performance indicators, which should clearly be defined during benchmarking (Oboegbulem & Kalu, 2013). This study sought from science teachers the extent to which budgetary allocation for sciences instructional resources are delineated per subjects per class and results presented in Table 4.25.

Table 4.25: Delineation of Science Instructional Resources Budgetary Allocations

School category	Disagree	Uncertain	Agree	Total
National	2	2	2	**6**
County	5	18	18	**41**
Private	9	15	12	**36**
Total	**16(19.1%)**	**35(42.2%)**	**32(38.5%)**	**83**

Findings in Table 4.25 shows that 42.20% (35) of science teachers were uncertain, 38.5% (32) agreed and 19.1% (16) disagreed that budgetary allocation for sciences instructional resources are delineated per subjects the per class. These results indicated that majority of science teachers who responded were uncertain of budgetary allocation for instructional resources are further delineated per class per subject in secondary schools in Nairobi County. This is attributed to ineffective budgetary information management is

some secondary schools in Nairobi County. This finings echoes Oplatka (2004) assertion that most secondary schools lack openness and are autocratic which make inappropriately focus on instructional management.

Further, Table 4.25 gives a clear picture of how schools differ in terms delineation of budgetary allocations for instructional resources. It show that, out of six science teachers from national secondary schools, two agreed, two were uncertain and two disagreed that budgetary allocation for sciences instructional resources are delineated per subjects the per class. In case of those from county secondary schools 18 science teachers agreed, 18 were uncertain and five disagreed out of 41who responded. From private secondary schools out of 36, 12 agreed, 15 were uncertain, 9 disagreed that budgetary allocation for sciences instructional resources are delineated. These findings made it difficult to deduce which categories of secondary schools had delineated budgetary allocation for instructional resources per subject per class

.

4.5.4 3 Procurement Management for Science Instructional Resources

Procurement of instructional resources in secondary schools in Kenya starts with setting tendering committees as required by Public Procurement and Asset Disposal Act 2015 (PPADA). The main provision of PPADA is decentralization which grants teachers and subordinate staff the power to control procurement process through tendering committees in secondary schools. This study sought to establish the extent to which decentralization grant science department control over sourcing of instructional resources. Specifically, it

sought to find out the role of science department in drawing up a procurement plan for instructional resources and the responses as presented in Table 4.26.

Table 4.26: Role of Science Department in Procuring Instructional Resources

School category	Disagree	Uncertain	Agree	Total
National	2	3	1	**6**
County	5	13	23	**41**
Private	7	15	14	**36**
Total	**14(16.9%)**	**31(37.3%)**	**38(45.8%)**	**83**

Findings in Table 4.26 reveal that out of 83 science teachers 45.8% (38) agreed, 37.30% (31) were uncertain, 16.9% (14) disagreed. This is an indication that about 46% of s Science teachers agreed that each term at departmental level, they plan for procurement of instructional resources. These findings are an indication that public procurement reforms which were initiated in 2005 to enhance efficiency in the management of financial resources has not fully bore fruits in public schools. Secondary schools need to implement procurement reform initiatives to enhance utilization of instructional resources for learning sciences in secondary schools (Nyanyuki et al, 2009). This study finding is indicative that more need to be done and is in concurrent with assertion of IPAR that more than half of secondary schools in Kenya do not adhere to provisions of the procurement law and in most cases abused by tender committee members (IPAR, 2007).

Further, these results indicated that in county secondary schools, science teachers were more likely to have termly procurement planning compared to other categories of schools. Most science teachers in both national and private categories were uncertain compared to those who responded from county secondary schools. In private secondary

schools, it is expected to have either teachers being uncertain or disagreeing because they are not bound to implement PPADA. Non-adherence to guidelines of Public Procurement and Disposal Regulations Act 2005 has sometimes been attributed to limited knowledge (Transparency International, 2005). This became clearer from interviews of secondary schools principals. According information obtained from the principals, a minority of them acknowledged that their institutions have specific procurement plan for instructional resources. This was in concurrence with science teachers' general comments on ensuring that funds allocate for science instructional resources which pointed at limited involvement. A minority of science teachers were on contrary by noted that they were involved in procurement through department

4.5.4.4 Expenditure Reports for Science Instructional Resources

Financial records are used for generation of monitoring reports which provide vital information about budget spending patterns on instructional resources (Wanyama, 2010). Secondary schools have accounting information systems into which daily transactions are recorded. Budget monitoring reports are made from daily transactional records prepared by school bursars using accounting information systems (Deegan & Unerman, 2011). Expenditure reports according to Ojiambo (2010) should indicate budgeted revenues, actual revenue and costs to date and the variances between them. Effective expenditure reports would show how much of the budgetary allocations for instructional resources for science have been spent at a given time.

This study sought from science teachers the existence of record of transactions in sourcing instructional resources from which periodic reports are produced at departmental level and results presented in Table 4.27

Table 4.27: Existence of Expenditure Records at Departmental Level

School category	Disagree	Uncertain	Agree	Total
National	1	3	2	**6**
County	4	20	17	**41**
Private	9	10	17	**36**
Total	**14(16.9%)**	**33(39.8%)**	**36(43.4%)**	**83**

Findings in Table 4.27 show that out of 83 science teachers, 43.4% (36) agreed, 39.80% (33) were uncertain, 16.9% (14) disagreed. This was an indication that less than a half of science teachers confirmed existence of expenditure records of transactions involving instructional resources. Equally, a large number were either uncertain or disagreed. This meant that secondary schools where science teachers were uncertain don't have these records at the department level. These findings also indicate that a larger number of science teachers from private schools agreed that expenditure records for instructional resources are kept at the departmental level. Instructional resources expenditure record keeping touches on accountability. And majority of Science teachers from private schools agreeing they undertake this at departmental level some supports Jimenez, Mutain and Vizente (1991) who asserted that private sector's role in the provision of education increases efficiency and their management could be more responsive to instructional needs.

4.5.4.5 Involvement of Science Teacher in Budget Reviews

Effective budget monitoring would show how much of the budgetary allocations for instructional resources for science have been spent at a given time. In seeking to establish participation of science teachers in periodic budget reviews to incorporate changes in instructional resources demand and results presented in Table 4.28

Table 4.28: Science Teachers Involvement in Budget Reviews

School category	Disagree	Uncertain	Agree	Total
National	2	1	3	**6**
County	10	11	20	**41**
Private	8	18	10	**36**
Total	**20(24.1%)**	**30(36.1%)**	**33(38.4%)**	**83**

Findings in Table 4.28 show that out of 83 science teachers, 36.10% (30) of science teachers were uncertain, 38.4% (33) agreed and 24.1% (20) disagreed that they were involved in budget review to address demands for instructional resources. These results indicate that majority of science teachers were either uncertain or disagreed that they were involved in budget reviews. This echoes the findings of Kahavizakiriza, Walela and Kukubo (2015) that budget reviews are only done by the principals and BOMs in most institutions. It also indicated that principals take up most of the managerial decisions involving finances without involving teachers.

Further, Table 4.28 indicate analysis science teacher's responses according to categories of secondary. Out of six science teachers from national secondary schools three agreed, one was uncertain and two disagreed that they were involved in budget reviews to address instructional resources demand. In case of county secondary schools, 20 agreed, 11 were uncertain and 10 disagreed. Those agreeing from national and county secondary

schools were 50% compared to 10 out 36 from private schools. In those secondary schools where periodic budget reviews involve science teachers instructional resources are availed throughout the year and at the right time. This in turn would go a long way in ensuring quality instruction through appropriate utilization of science instructional resources in secondary schools. Further, appropriate utilization of science instructional resources would ensure realization of good learning outcomes in sciences.

4.5.5 Budget Control Mechanisms for Science Instructional Resources

Budget control mechanisms link responsibilities involved in sourcing of instructional resources to requirements of school financial management policy (George, 2005). Further, budget control mechanisms enable secondary school management to understand and follow the limits on their authority to expend. It also allows changes during the budget period. It involves information management to allow compliance at all levels from science teacher to the principal in terms of sourcing for instructional resources. In this study, school budget control mechanisms included requisition procedures, spending authorization, transaction records, payments confirmation, reconciliation of purchases, and auditing.

4.5.5.1 Requisition Procedures for Science Instructional Resources

Secondary schools require a wide range of science instructional resources in order to achieve good learning outcomes. Good practice requires that requisition of science instructional resources are done in a way that ensures quality product at the most

affordable cost (Gachomba, 2012). Secondary schools are expected to have standardized requisition procedures carefully prepared to meet changing needs and requirement in instructional management. This ensures information flow according to established guidelines and regulations in sourcing science institutional resources (Griffith and Griffith, 2002). This study sought to establish existence of pre-designed requisition procedures for science instructional resources in secondary schools in Nairobi County and results presented in Table 4.29.

Table 4.29: Existence of Pre-Designed Requisition Procedures

School category	Disagree	Uncertain	Agree	Total
National	0	2	4	**6**
County	6	21	14	**41**
Private	10	14	12	**36**
Total	**16(19.30%)**	**37(44.60%)**	**30 (36.1%)**	**83**

The findings presented in Table 4.29 indicate that out of 83 science teachers, 36.1% (30) agreed, 44.6% (38) were uncertain and 19.3% (16) disagreed. This was an indication that more than half of secondary schools in Nairobi County did not have pre-designed requisition procedure for sourcing of instructional resources. The large number of uncertain science teachers (44.6%) was attributed to cases where requisition is done by store keepers on behalf of the staff in some secondary schools in Nairobi County. This confirms Transparency International (2010) assertion that in secondary schools in Kenya, requisition procedures are prone to governance risks.

Schools without pre-designed requisition procedures experience wastage of resources that would otherwise strengthen science instructional management in secondary schools (Mutahi, 2003). This is attributed to non-adherence to budget control mechanism even

where they are fully understood. However, Table 4.29 indicate that requisition procedures for science instructional resources were more standardized in national secondary schools, which could be attributed to the fact that they are more established. Further, out of six science teachers from national schools, four agreed and two were uncertain that there exists a pre-design requisition procedure in their schools. It is expected that the more established county secondary schools should have good financial management practices being undertaken, same with those private category having management that are more responsive to instructional need of students.

4.5.5.2 Spending Authorization for Science Instructional Resources

Financial management in a secondary school should have an accounting system whose goal to provide prudent control and proper accountability of funds allocated for various activities including science instructional resources. It is essential for secondary schools to ensure that there is a systematic authorization procedure in sourcing for science instructional resources for effective biology, chemistry and physics instructions. Secondary schools principals are regarded as financial controllers and accounting officers with specific authority to obligate their institutions to spend money (Langat, 2008). Limited delegation of spending authority may be granted to bursar or head of science departments in more established schools.

This study sought to establish through science teachers if orders for science instructional resources were approved by the principal to give authority for delivery and results presented in Table 4.30.

Table 4.30: Spending Authorization for Science Instructional Resources

School category	Disagree	Uncertain	Agree	Total
National	0	5	1	**6**
County	3	8	30	**41**
Private	3	7	26	**36**
Total	**6(7.2%)**	**20(24.1%)**	**57(68.6%)**	**83**

Findings in Table 4.30 showed that out of 83 science teachers, 68.6% (57) agreed that principals must authorize spending on instructional resources. This echoed Langat (2008) assertion that principals are regarded as financial controllers and accounting officers in secondary schools. Also as presented in Table 39, 24.10% (20) science teachers were uncertain, 7.2% (6) disagreed that principals do authorization for spending on instructional resources. This would only happen in secondary schools where delegation of authority is practiced. This was in tandem with suggestion of Koross, Ngware and Sang, (2008) that it is equally important to delegate authority within secondary school financial management system as a budget control mechanism.

In practice, some secondary schools delegate responsibility to bursars, head of science department and sometimes deputy principals. However, Kuria (2007) in her work on budgeting process and financial management in secondary schools recommended that limited delegation of spending authority could be granted to bursar or head of science departments. The extent to which delegation of authorization in sourcing instructional resources as seen in Table 4.30 where science teachers' responses were considered in

terms of schools categories. The results clearly show that none of the Science teachers from national secondary schools disagreed that principals do authorize spending on instructional resources. Specifically, five were uncertain and one agreed. This is possible in national secondary schools because they are more established and have systems with standardize procedures.

Delegated authority is also possible in more established county and private secondary schools. From Table 4.30, out of 41 science teachers from county secondary schools 30 agreed, eight were uncertain and three disagreed that spending authorization is the responsibility of the principal. From private secondary schools out of 36, 26 agreed, seven were uncertain and three disagreed. However, according to Koross, Ngware and Sang, (2008) delegated responsibility could be given to bursars, head of science department or may be deputy principal. In conclusion any purchase instructional resources by science teachers prior consent by the appropriate individual is deemed unauthorized.

4.5.5.3 Transaction Records for Science Instructional Resources

Adequate books of account should be maintained in secondary schools and need to be often updated as a control mechanism in instructional management. In managing budgetary allocations for instructional resources, bursars and accounts clerks are expected to assist secondary schools principals' in keeping all records of transactions for effective utilization (Langat, 2008). This is part financial management guidelines from MOEST, which demands that they maintain proper accounting records not only for

instructional resources, but for all the school's revenues and expenditure (Alderman et al, 2001). Maintenance of proper transactional records is also a requirement of corporate financial management which private secondary schools must subscribe to. Therefore secondary schools, whether public or private must account for all funds allocated for instructional resources as a control mechanism aimed at good learning outcomes in sciences.

For effective control in managing budgetary allocations for instructional resources, copies of transaction records kept by bursars and accounts clerks should be surrendered to science departments. This would have a positive significance on utilization of science instructional resources in secondary schools. This study sought from science teachers the whether records of orders and copies of delivery notes for science instructional resources are kept at the department and results presented in Table 4.31.

Table 4.31: Transaction Records at Departmental Level

School category	Disagree	Uncertain	Agree	Total
National	0	2	4	**6**
County	2	13	26	**41**
Private	4	18	14	**36**
Total	**6(7.2%)**	**33(39.8%)**	**44(53.0%)**	**83**

Findings in Table 4.31 indicate that out of 83 science teachers, 53.0% (44) agreed, 39.80% (33) were uncertain and 7.20% (6) disagreed. This was an indication that in more than half of secondary schools in Nairobi County, copies of orders and delivery notes were at the departmental level. This is useful in tracking consumption of instructional resources at a given period of time without necessarily showing how much have been spent. It enables tracking consumption of instructional resources without necessarily

showing how much have been spent. However, Table 4.31 indicated that out of six science teachers from national secondary schools two were uncertain that transactional records are kept at the departmental level. In the county category, 26 science teachers agreed, 13 were uncertain and 2 disagreed. Meanwhile, from private secondary schools 14 agreed, 18 were uncertain and 4 disagreed. This is an indication that majority of science teachers who disagreed came from private secondary schools. As much as records of orders and delivery notes may not reveal a lot financially management of private secondary schools may still want to keep them away from the staff. This could be attributed to attitude of some private secondary schools principals towards teachers' involvement in financial issues as revealed by a study conducted by Wagithunu et al (2015). However, keeping transaction record at departmental level would ensure adequacy and availability of science instructional resources and significantly influence learning outcomes in sciences

4.5.5.4 Payment Confirmations for Science Instructional Resources

Instructional resources are required to be adequately provided in form, quality and quantity for learning to take place. Before any payment is done for instructional resources, it is imperative for science teachers as end users to ascertain both quality and quantity of supplies. According to Onno (2010) a systematic process should be in place from the subject through head of science department to the principal to approve payment by the bursar or accounts clerk. This is part of the accountability process which guarantees that school money has been used in a responsible and profitable manner as intended.

This necessitate the need to establish the role of science teachers in ensuring instructional resources supplied are of the right quality and quantity as presented in Table 4.32.

Table 4.32: Role Science Teachers in Payment Confirmations

School category	Disagree	Uncertain	Agree	Total
National	0	2	4	**6**
County	4	13	24	**41**
Private	4	14	18	**36**
Total	**8 (9.60%)**	**29(34.90%)**	**46(55.40%)**	**83**

From Table 4.32, slightly more a half of science teachers who responded confirmed that they do undertake verification before any payment is done. Specifically, as shown in Table 41, out of 83 science teachers who responded 55.4% (46) agreed that they play a role in ascertaining the quality and quantity of instructional resources supplied before any payment could be made. The results indicate that in most secondary schools science teachers check quality of instructional resources on delivery before any payment is done. These findings were in tandem with Nyanyuki et al (2013) recommendations that a systematic process should be in place from subject teacher through head of science department to the principal to approve payment by the bursar or accounts clerk.

Participation of science teachers in verifying quality and quantity of instructional resources would have a positive influence on utilization. However, findings in Table 40 also indicate that nearly half of science teachers who responded were either uncertain or disagreed that they participate in verification of quality and quantity of supplied instructional resources before payments are done. It is shown in Table 4.32 that 34.90% (29) of science teachers were uncertain and 9.60% (8) disagreed which was an indication

of limited or no participation in quality and quantity control as far as instructional resources are concerned. This was in contrary to the findings of Witty (2003) where it was suggested that teachers have a role of ensuring quality instructions and overall sailing in the academic spheres.

Further, Table 4.32 show that in all to categories of schools, atleast a half of science teachers who responded agreed or strongly agreed that they are involved in quality and quantity verification before paymnet for instructional resources is done. Specifically, Table 41 indicated that out of six science teachers from national secondary schools, four agreed; in county category, out of 41 science teachers 24 agreed and from private counterparts, out of 36 who responded, 18 agreed. From these results it can be concluded that participation of scinece teachers in quality and quantity verification before paymnet for instructional resources is done was not dependant on seconadry schools category in Nairobi county. It could be concluded that any diffrence in level of sceince teachers participation could be attributed to financial leadership style amd instructional managemnet approcah in specific seconadry schools in Nairobi County

4.5.5.5.Reconciliation of Science Instructional Resources Purchases

Reconciliation of purchases is management trail that allows financial transactions to be traced from the accounting records to the original budget document. According to Mestry (2006), the budget can only be declared credible by measuring the number of deviations from budgetary allocations for different activities. This is a measure of supplementary demands and re-appropriations during the budget period and the magnitude of final

excess and saving over the approved budget. It therefore follows that during reconciliation of purchase interest should be on what was budgeted for, what have been delivered and what could be the deficit or surplus. This study sought from science teachers in secondary schools possible participation in regular reconciliation of purchases on instructional resources at departmental level and results presented in Table 4.33

Table 4.33: Purchases Reconciliations at Departmental Level

School category	Disagree	Uncertain	Agree	Total
National	2	1	3	**6**
County	5	15	21	**41**
Private	7	20	9	**36**
Total	**13(16.9%)**	**36(43.40%)**	**33(39.70%)**	**83**

Results in Table 4.33 indicated that majority of science teachers were uncertain of the practice of purchases reconciliation at the departmental levels. Specifically, the results in Table 4.33 shows that 43.40% (36) of science teachers were uncertain, 39.7% (33) agreed, 16.9% (14) disagreed. The fact that 43.40% (36) of science teachers were uncertain 16.9% (14) disagreed, point to an indication that majority of science teachers do not participate in reconciliation of purchase of instructional resources. With limited or no participation of science teachers in reconciliation of purchases, deviations from budgetary allocations negatively impact on utilization of instructional resources.

Further, from Table 4.33 science teachers' responses according to category of secondary schools reveal that there was more uncertainty and disagreement in private school than in their public counterparts. Table 4.33 indicate that out of 36 science teachers who responded from private schools, 20 were uncertain and seven disagreed. This could be explained from the fact that unlike public secondary schools which are required to adhere

to provisions of Public Procurement and Disposal Asset Act 2015, private ones are not obliged to follow PPDAA.

4.6 Utilization of Science Instructional Resources

Sciences learning focus on investigating phenomenon through scientific enquiry. Science subjects equip learners with manipulative skills through utilization of instructional resources in classroom and laboratory. Sufficiency of instructional resources is a key factor in learning achievements in science subjects. Instructional resources therefore enable science teachers to make explanations during instructions much clearer to the learner (Isola, 2010). Consequently, instructional resources like books, science laboratory equipment, audiovisuals, charts, writing boards and other educational materials are required for learning to take place. Utilization of instructional resources in a school is important in achievement of educational goals. Instructional management is a complex and demanding task that requires specialized resources to impact significantly on student learning. In general, learning outcome is influenced by proper utilization of instructional resources.

In this study, the focus was on the effect of instructional resources utilization on learning of science subjects in secondary schools in Nairobi County, Kenya. Science teachers and form four students were asked to indicate on a three point scale how often specific instructional resources are used in classroom (where 1= rarely, 2= occasionally and 3= Often). In analysing the results, a mean between 1 and 1.49 was taken to mean rare usage; 1.5 and 2.49 occasional usage; and 2.5 and above often usage. In this study, a total of 171 form four students responded and as earlier noted 169 (98.83%) are taking

chemistry, 129 (75.44%) taking biology and 124 (72.51%) taking chemistry. Out of 83 science teachers who responded 28 (33.70%) teach physics, 28 (33.70%) chemistry and 27 (32.50%) biology in secondary schools in Nairobi County. The responses of science teachers and form four students regarding utilization of instructional resources were analysed and presented in Table 4.34

Table 4.34: Response on Utilization of Instructional Resources

		Science Teachers		Learners		Overall
Resource	**Subject**	**n**	**Mean**	**n**	**Mean**	**Mean**
Charts	Bio	27	2.07	**129**	1.88	1.98
	Chem	28	1.75	169	2.15	1.95
	Phys	28	2.14	124	2.04	2.09
Models	Bio	27	2.07	**129**	1.94	2.01
	Chem	28	1.75	169	2.13	1.94
	Phys	28	1.71	124	2.05	1.88
Chalkboard	Bio	27	2.89	**129**	2.39	2.64
	Chem	28	2.79	169	2.51	2.65
	Phys	28	2.71	124	2.66	2.69
Practical	Bio	27	1.26	**129**	1.47	1.37
	Chem	28	1.25	169	1.49	1.37
	Phys	28	1.46	124	1.46	1.46
Specimen	Bio	27	1.77	**129**	1.29	1.53
	Chem	28	1.36	169	1.41	1.39
	Phys	28	1.54	124	1.44	1.49
Whiteboard	Bio	27	2.26	**129**	2.69	2.48
	Chem	28	2.14	169	2.24	2.19
	Phys	28	2.39	124	2.48	2.44
Projector	Bio	27	2.41	**129**	2.24	2.33
	Chem	28	2.32	169	2.54	2.43
	Phys	28	2.39	124	2.32	2.36
Text Books	Bio	27	2.44	**129**	2.50	2.47
	Chem	28	2.43	169	2.77	2.60
	Phys	28	2.61	124	2.58	2.59
Handouts	Bio	27	2.26	**129**	2.28	2.27
	Chem	28	1.96	169	2.23	2.10
	Phys	28	1.79	124	2.37	2.08
Pamphlets	Bio	27	2.26	**129**	2.29	2.28
	Chem	28	2.00	169	2.23	2.12
	Phys	28	2.00	124	2.39	2.20
Computers	Bio	27	2.41	**129**	2.38	2.40
	Chem	28	2.29	169	2.21	2.25
	Phys	28	2.39	124	2.42	2.41
Calculators	Bio	27	1.96	**129**	1.86	1.91
	Chem	28	1.93	169	2.69	2.31
	Phys	28	1.96	124	2.54	2.25

4.6.1 Utilization of Charts in Science Instructions

Charts are printed media which include but not limited to photographs, reproduced pictures, drawings, murals, cartoons, diagrams, and graphs used during science

instructions in secondary schools. According to the findings in Table 4.39, charts are occasionally used in teaching sciences in secondary schools. Specifically, according to the findings in Table 4.34, a mean of 2.09 for Physics, 1.98 for Biology and 1.95 Chemistry. These results were an indication of a wider use of charts in physics than other two science subjects. However, form four students acknowledged wide use of charts in chemistry (mean 2.15) than science teachers (mean 1.75) while the reverse was seen in biology. In biology science teachers (mean 2.07) were more certain in the use of charts compared to students (1.88).

In budgeting for charts, secondary schools in Nairobi could choose commercially printed ones on paper or canvas. Commercially printed charts are bought and can be hanged on wall of the laboratory, library or classroom. Most can last longer and especially those made of canvas and may not be budgeted every year. Alternatively, secondary schools could budget for manila papers where r science teachers could make charts for specific lessons. In general charts are suitable for long-term use on classroom or laboratory walls as pictures, drawings or photographs. Charts are effective in providing a visual imagery during science instructions for teachers and learners. In addition, as noted by Krajcik, McNeill and Reiser (2007) in their work on alignment of instructional resources with standard project-based pedagogy, charts are realistic in providing details which are key for visual recognition of content during instructions.

4.6.2 Utilization of Models in Science Instructions

According to Chiapetta and Koballa (2010), use of models in science instruction is a physical, computational, or mental representations of ideas. Models are tools used for

expressing scientific theories in a way that is easy to manipulate while allowing for description, prediction and explanation. Study results in Table 4.34 indicate that models were occasionally used in science instruction in secondary schools in Nairobi County. According to responses from Science teachers and students responses, on Biology (mean 2.01), Chemistry (mean 1.94) and Physics (mean 1.88). The results indicated that more Science teachers (mean 2.07) than students (mean 1.95) acknowledged that models were used in Biology instructions in their schools. In both Chemistry and Physics, more students indicated occasional use of models during instruction.

Most models are made from plastic and once bought can stay for long, hence annual budgetary allocations could only be for additional model as may be needed by a teacher. These type of instructional resources supports learning activities in Science classrooms and laboratories. They include use of plastic replica of organs which are sculpted reproduction intended to be used as instructional resources in biology. Physical models such as ball-and-stick chemical molecules used in chemistry class; and mechanical models of engines built with Lego bricks and gears for learning in Physics. In general, use of models is directly in line with the activities associated with the scientific learning. Agreeing with this argument, Chiapetta and Koballa (2010) asserted that models are themselves the actual language of Science.

4.6.3 Utilization of Chalkboard in Science Instructions

Chalkboards were originally smooth, thin sheets of black gray slate stone or wooden boards. Today, chalkboards are black, green or brown. Chalkboard is one of the most widely used instructional resources for science learning (Ajileye, 2006). Findings from

this study as indicated in Table 4.34 confirms this assertion because responses from science teachers and students gave a mean 2.64 for use of chalkboard in biology, 2.65 in chemistry and 2.69 in physics. The popular use of chalkboard could be explained by assertion by Falade (2006) that they not only effective but also versatility with several advantages during instruction. First, material presented can easily be erased to allow the surface to be used again and again. Secondly, they are excellent in serving as a medium for interactive joint student- instructor activities during instructions. Chalkboards are normally part of classroom construction work and are part of school capital budgeting. Utilization of chalkboard requires chalk and dusters which must be budgeted for annually. Secondly, a budgetary allocation should be painting chalkboard.

4.6.4 Practical Activities in Science Instruction

Practical learning activities are vital in linking what leaners observe and theoretical scientific ideas that account for their observations. For practical activities to effectively produce meaningful learning there should be active engagement of learners in scientific investigations focusing on desired outcomes. Findings of this study as presented in Table. 4.34 indicate that practical activities are rarely used as instructional resource in science learning. Specifically, analysis of students and science teachers' responses in Table 4.34 gave a mean of 1.37 for use of practical in biology, 1.37 in chemistry and 1.46 in physics. These findings were an indication that in majority of secondary schools in Nairobi county science instructions involves more chalk-and-talk and little practical work as suggested by higher use of chalkboard. Contrary to the findings at a study conducted Millar (2004) who asserted that practical work engages learners in observing or manipulating real objects and is appropriate in understanding skills and enjoyment of sciences. This finding

therefore points to the fact that most students from the study are lacking the opportunity for further skills and enjoy Sciences.

The findings that practical were rarely used in teaching science subjects in secondary schools, could be because models, charts and computers were used by science teachers and they reduce the need of practical experiments. This would easily influence budgetary allocations for practical equipment. However, the study findings echo Ituma, Twoli and Khatete (2015) assertion that many scholars have significant doubts on effectiveness of practical work science knowledge and skills acquisition. Quoting several studies, Ituma, Twoli and Khatete (2015) argued that the nature of practical activities carried out Kenyan secondary schools are on developing students' knowledge in sciences, rather than on developing understanding of scientific investigative procedures.

4.6.5 Utilization of Specimen in Science Instructions

Use of investigative approaches in instructional management through practical work is a sure way of learning in sciences (Millar, 2004). Practical activities in science instruction sometimes require experiments to be carried. Experiments in sciences and particularly in biology sometimes need specimen, though not all topics. The findings of this study according to Table 4.39 indicated that utilization of specimen as instructional resources in science learning is not common in secondary schools in Nairobi County. Specifically, results as indicated in Table 4.34 show a mean for biology of 1.53, chemistry 1.39 and physics 1.49. These findings indicated that specimens were occasionally used in secondary schools in biology instructions and rarely in chemistry and physics.

Budgetary allocations for specimens depend on what Science teachers require every term. Taking into consideration that some of the requirements in Biology may include plants which are seasonal. With existence of models, charts and computers, which can be used to address challenges of investigative leaning in sciences, budgetary allocations for specimen in secondary schools could be dwindling. Utilization of models, charts and computers provide alternative instructional resources for learning among teachers and students thereby reducing the need for specimens. This explains why there is low utilization of specimen in secondary schools in Nairobi County.

4.6.6 Utilization of Whiteboard in Science Instructions

Whiteboard is an instructional resource for emphasizing essential information and developing ideas as during instructions in the classroom. According to Yandila, Komane and Moganane (2003), whiteboards are gradually gaining prominence in secondary schools and are replacing chalkboards. This is so because they are of different sizes and are considered powerful tool for facilitating discussion among groups of students. In this study the findings in Table 4.34 indicate that whiteboards were occasionally used Analysis of results from responses of science teachers and students gave a mean of 2.48 for utilization of whiteboards in Biology instructions, 2.19 in Chemistry and 2.44 in Physics. These findings indicate that whiteboards are gradually taking over blackboards in classrooms or rather are used complimentarily during instructions in secondary schools in Nairobi County.

Budgetary allocations for whiteboards depend on preferred sizes. Secondary schools can opt to buy a 4’x8’ sheet white economy tile board to substitute chalkboard or to be cut

into 24”x 32” for strategic positioning within the classroom. Like chalkboards, whiteboards are permanently fixed on the walls and need not to be budgeted for every year during secondary schools budgeting process. However, annually, secondary schools should budget for dry erase markers and cleaners to be used on whiteboards.

4.6.7 Utilizations of Projector in Science Instructions

Science instructions may employ the use of overhead projection with slides and transparencies. Overhead projectors have been in existence in established schools worldwide because once bought they have low maintenance demand and budgetary allocation could be minor repairs and very affordable accessories. Modern classrooms are embracing instructional technology that includes LCD projectors used with a computer project an image onto a screen. As noted by Yandila et al (2003), LCD provides flexibility in content delivery during instruction in a classroom. In this study, the results presented in Table 4.34 indicated that overhead projectors are occasionally used during science instructions in secondary schools in Nairobi County.

Responses in Table 4.34 on utilization of overhead projectors among secondary schools science teachers and students revealed a mean of 2.33 in Biology, 2.43 in Chemistry and 2.36 in Physics. This was an indication that overhead projectors use was gradually gaining prominence in secondary schools, which could be allocating funds for their purchase. This is in line with assertion by Chiapetta and Koballa (2010) that overhead transparency and projector is more convenient and cost effective instructional resources for teaching and learning in science subjects. Once acquired, secondary schools should budget for acetate or plastic for science teachers to create overhead transparencies, or

allocate funds for purchasing of commercially produced slides. The use of projectors require techno savviness in among Science teachers.

4.6.8 Utilization of Text Books in Science Instructions

Schools could be budgeting for different titles of books yearly and with proper maintenance programme books can last for a number of years. Existence of variety of books schools could be systematically adding new titles which would require annual budgetary allocation. Also, schools would simply budget for number of different title for stocking the library. Responses from Table 4.34 revealed a mean of 2.36 for biology, 2.60 chemistry and 2.27 for physics. These findings were an indication that text books are often as instructional resources in science learning in secondary schools. This findings supports Ajileye (2006) assertion that text book are some of the commonly used instructional resources in science instruction.

4.6.9 Utilization of Handouts in Science Instructions

Handouts may be prepared noted on a topic or a concept, photos, sketches, diagrams, charts, graphs, flowcharts, or maps. They can be effective science instructional resources and can masterpieces professionally produced or just simply hand-lettered document sheets. Further, as noted by Krajcik et al, (2007), handouts are most effective when they are organized according to the planned learning outcomes for class. From findings of this study as presented in Table 4.34, utilization of handouts as instructional resources according to science teachers and student had a mean of 2.27 in biology, 2.10 in chemistry and 2.08 in physics. This was an indication that handouts are occasionally used in science instruction in Nairobi county secondary schools.

For effective utilization of handouts as instructional resources in teaching and learning science subjects, secondary schools should allocated adequate funds for printing papers, ink and maintenance of computers, printers and photocopier machines. These are particularly ideal in situations where secondary schools lack suitable textbooks for all learners. Secondly, in such situations use of handouts ensures information learners have is accurate and relevant to learning objectives. Thirdly, with adequate budgetary allocation science teachers may use handouts to reduce time needed to cover certain topics and in turn increase time for other student learning activities.

4.6.10 Utilization of Pamphlets in Science Instructions

Pamphlets are prepared by teachers or could be photocopied from existing materials and budgeting for them would be through allocation for papers, cartridges or toners for printers and photocopiers. In more established schools science departments could be having their own printers and copiers and could be independently be allocated funds for tonners, cartridges and papers. Otherwise, in most schools these are pooled and allocated for funds for all sections and departments. Responses from science teachers and students as presented in Table 4.34, revealed a mean 2.08 for utilization of pamphlets in biology, for chemistry a mean of 2.28 and for physics a mean of 2.12. These findings were an indication that pamphlets are occasionally utilized in science instructions in secondary schools in Nairobi County. This echoes recommendations from a study conducted by Adeleke (2010) in Nigeria that the use of pamphlets is a way of improvisation for instructional resources.

4.6.11 Utilization of Computers in Science Instructions

The rationale for using computers in science instruction is based on increasing dependence on Information and Communication Technologies (ICTs) in education as well as in other sectors for economic and social well-being. In this regard, according to Burusic, Babarovic and Seric (2012), simulation of complex real world phenomena allow learners to manipulate abstract scientific concepts for easy learning in biology, chemistry and physics. This enables learners to interact with phenomena that previously were not accessible due to safety, time, expense, or space restrictions. This explains results of this study as presented in Table 4.34 which indicate occasional utilization of computer in science instruction in secondary schools in Nairobi County.

Specifically, results in Table 4.34 showed that utilization computers in biology had a mean of 2.40, chemistry 2.25 and physics 2.41. Acceptance of ICT in instructional management has resulted into a multimedia computer assisted learning (CAL). This is a combination of media incorporating audio, text, graphics, and video (or film). For multimedia approach to be achieved in science instruction, secondary schools should gradually stock them through annual budgetary allocations which should also cater for maintenance, repairs and acquisition of accessories. However, multimedia approach in science instructions requires science teachers' competence in information technology.

4.6.12 Utilization of Calculators in Science Instructions

The emergence of multimedia approach in instructional management introduces a technology for time management in mathematical issues during learning and examinations in science subjects. Previously, time management in computations during learning was addressed by Slide rules and Mathematical tables. However, today

calculators are used along with traditional paper-and-pencil instruction and have enhanced learning during science instructions. Analysis of responses of science teachers and student on utilization of calculators indicated occasional usage in science instruction in secondary schools in Nairobi County. Specifically, findings from analysis of responses from science teachers and students in Table 4.34 indicated a mean of 1.91 for utilization in biology, 2.31 in chemistry and 2.25 in physics.

Provision of calculators for science instruction is a challenge because secondary schools do not have budgetary allocation for them. According to Ochanda and Indoshi (2011), secondary schools asks parents to provide learners with scientific calculators, those some cannot afford the items. Generally, calculators not only help in improving spatial visualization skills, but also enhance critical thinking ability of learnings during science instructions (Adeleke 2010). Further, Ochanda and Indoshi (2011) asserted that calculators enable learners in understanding of connections among graphical, tabular, numerical, and algebraic representations. This in turn will lead into improvement of students' confidence in sciences

4.7 Testing of Hypothesis

Based on the specific objectives, the study sought to test the following null hypotheses

H01 There is no significant relationship between school financial management policy framework on budgeting process and utilization of instructional resources in Science instruction.

H02 There is no significant effect of stakeholders' participation in budgeting process on utilization of instructional resources in Science instruction.

H03 There is no significant relationship between budget planning procedure and utilization of instructional resources in Science instruction.

H04 There is no significant effect of budget monitoring process on utilization of instructional resources in Science instruction.

H05 There is no significant effect of budget control mechanisms on utilization of instructional resources in Science instruction.

Hypothesis testing is a process by which the researcher infers the result of sample data on the larger population based on a presupposition made prior to commencement of research (Gujarati, 2003). In testing Hypotheses **H01, H02, H03, H04 and H05** Principals Components Analysis (**PCA**) was used to derive scores for each of the independent variables. In **PCA**, one wishes to extract from a set of *p* variables a reduced set of *m* components or factors that accounts for most of the variance in the *p* variables. In other words, the aim is to reduce a set of *p* variables to a set of *m* underlying superordinate dimensions. These underlying factors are inferred from the correlations among the *p* variables. Each factor is estimated as a weighted sum of the *p* variables. The i^{th} factor is thus

$$F_i = W_{i1}X_1 + W_{i2}X_2 + \ldots + W_{ip}X_p$$

One may also express each of the *p* variables as a linear combination of the *m* factors,

$$X_j = A_{1j}F_1 + A_{2j}F_2 + \ldots + A_{mj}F_m + U_j$$

Where U_j is the variance that is unique to variable *j*, variance that cannot be explained by any of the common factors.

F Bartlett's test of sphericity and the Kaiser-MeyerOlkin measure of sampling adequacy were used to determine the factoriability of the matrices. The results value of Bartlett's test of sphericity were significant at $p<0.05$.

Table 4.35: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	10.078	5	.043
	Block	10.078	5	.043
	Model	10.078	5	.043

Table 4.36: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	104.972[a]	.114	.152

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

To estimate the relationship between utilization of instructional materials and the independent variables (viz; financial management policy, stakeholder participation, etc), logistic regression was used. An index for Utilization of Instructional Resources (UTR) was first derived using PCA and then categorized into two groups (low utilization and high utilization) using 50th superscript percentile of the distribution of the utilization index as presented in Table 4.37.

Table 4.37: Classification Dependent Variable PCA

Observed		Predicted		
		Utilization of Instructional Resources		Percentage
		Low Utilization	High Utilization	Correct
Utilization of Instructional Resources (UTS)	Low Utilization	24	17	58.5
	High Utilization	14	28	66.7
Overall Percentage				62.7

a. The cut value is .500

Letting Y be the binary response variable (UTR), it is assumed that $P(Y=1)$ is possibly dependent on $\vec{x}$, a vector of predictor values.

The goal is to model

$p(\vec{x}) \equiv P(Y = 1 \mid \vec{x})$.

Since Y is binary, modeling $p(\vec{x})$ is equivalent to modeling $E(Y \mid \vec{x})$. Thus

$p(\vec{x}) = \beta_0 + \beta_1 x_1 + ... + \beta_5 x_5$,

Then the fitted model is: $p(\vec{x}) = \frac{\exp(b_0 + b_1 x_1 + ... + b_5 x_5)}{1 + \exp(b_0 + b_1 x_1 + ... + b_5 x_5)}$, where $x_1, ..., x_5$ are the set of explanatory variables. Thus

$$\ln\left(\frac{p(\vec{x})}{1 - p(\vec{x})}\right) = b_0 + b_1 x_1 + ... + b_5 x_5 .$$

$$\left(\frac{p(\vec{x})}{1 - p(\vec{x})}\right) = \exp(b_0 + b_1 x_1 + ... + b_5 x_5) .$$

Table 4.38: Variables in the Equation for PCA

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	PF_SCORE	.016	.148	.012	1	.912	1.017
	SP_SCORE	.254	.137	3.435	1	.034	1.289
	BPP_SCORE	.331	.142	5.460	1	.019	1.392
	BMP_SCORE	.009	.116	.006	1	.940	1.009
	BCM_SCORE	-.019	.143	.018	1	.894	.981
	Constant	-1.351	2.482	.296	1	.586	.259

a. Variable(s) entered on step 1: PF_SCORE, SP_SCORE, BPP_SCORE, BMP_SCORE, and BCM_SCORE.

To estimate the relationship between utilization of science instructional resources and the independent variables (viz; financial management policy, stakeholder participation, etc), Ordinary Least Squares regression was used.

The results of the analysis are presented below:

Logit model:

$$\ln\left(\frac{p(\vec{x})}{1 - p(\vec{x})}\right) = -1.351 + 0.61PF + 0.254SP + 0.33BPP + 0.09BMP - 0.10BCM$$

$$\exp\left(\frac{p(\vec{x})}{1-p(\vec{x})}\right) = \exp(-1.351 + 0.61PF + 0.254SP + 0.33BPP + 0.09BMP - 0.10BCM)$$

Where PF=Policy Framework; SP= Stakeholder participation; BPP= Budget Planning Process; BMP= Budget Monitoring Process; BCM=Budget Control Mechanisms.

Given that it is only stakeholder participation (SP) and BPP which are significant at $p<0.05$ in the equation, the coefficients of the other three independent variables are equivalent to zero. Thus

Exp (0.254) = 1.289 implying that Exp (0.254) -1= 1.289-1=0.289= 28.9%

Exp (0.331) = 1.392 implying that Exp (0.331) -1= 1.392-1=0.392= 39.2%

Holding other factors constant, for every additional unit improvement in stakeholders participation in the school, the odds of high Utilization of Instructional Resources increase by 28.9%. Holding other factors constant, for every additional unit improvement in the budget planning process in the school, the odds of high Utilization of Instructional Resources increases by 39.2%.

a. **H01 There is no significant relationship between school financial management policy framework on utilization of instructional resources in science instruction**

The results as indicated in Table 48 show that there no significant relationship between school financial management policy and utilization of instructional resources in science instruction at p=0.5, this is evident since *p*-values corresponding to the coefficients of school financial management policy variable is equivalent to 0.912. This led to accepting the stated null hypothesis with 95% confidence level. By accepting the null hypothesis, the study concludes that there no significant relationship between school financial management policy on utilization of instructional resources in science instruction in secondary schools

b. H02 **There is no significant effect of stakeholders' participation in budgeting process on utilization of instructional resources in science instruction**

The results as indicated in Table 4.44 show that there is significant effect of stakeholders' participation in budgeting process on utilization of instructional resources in science instruction at 5%, this is evident since *p*-values corresponding to the coefficients of stakeholder participation variable is equivalent to 0.034. This led to rejecting the stated null hypothesis with 95% confidence level. By rejecting the null hypothesis, the study concludes that there is significant effect of stakeholders' participation in budgeting process on utilization of instructional resources in science instruction in secondary schools

Exp (0.254) = 1.289 implying that Exp (0.254) -1= 1.289-1=0.289= 28.9%

Holding other factors constant, for every additional unit improvement in stakeholders participation in the school, the odds high Utilization of Instructional Resources increases by 28.9%.

c. H03 There is no significant relationship between budget planning procedure and utilization of instructional resources in science instruction

The results as indicated in Table 48 show that there is a significant relationship between budget planning procedure and utilization of instructional resources in science instruction at 5%, this is evident by *p*-values corresponding to the coefficients of budget planning procedure is equivalent to 0.019. This led to rejecting the stated null hypothesis with 95% confidence level. By rejecting the null hypothesis, the study concludes that there is a significant relationship between budget planning procedure and utilization of instructional resources in science instruction in secondary schools

Exp (0.331) = 1.392 implying that Exp (0.331) -1= 1.392-1=0.392= 39.2%

Holding other factors constant, for every additional unit improvement in budget planning process in the school, the odds high Utilization of Instructional Resources increases by 39.2%.

d. **H04 There is no significant effect of budget monitoring process on utilization of instructional resources in science instruction**

The results as indicated in Table 48 show that there no significant effect of budget monitoring process on utilization of instructional resources in science instruction at p=0.5, this is evident by *p*-values corresponding to the coefficients of budget monitoring process variable is equivalent to 0.940. This led to accepting the stated null hypothesis with 95% confidence level. By accepting the null hypothesis, the study concludes that there no significant effect of budget monitoring process on utilization of instructional resources in science instruction in secondary schools

e. **H05 There is no significant effect of budget control mechanisms on utilization of instructional resources in science instruction**

The results as indicated in Table 4.44 show that there no significant effect of budget control mechanisms on utilization of instructional resources in science instruction at p=0.5, this is evident by *p*-values corresponding to the coefficients of budget control mechanisms variable is equivalent to 0.894. This led to accepting the stated null hypothesis with 95% confidence level. By accepting the null hypothesis, the study concludes that there no significant effect of budget control mechanisms on utilization of instructional resources in science instruction in secondary schools

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1Introduction

In this chapter there are summary of the empirical findings derived from the study, conclusions and the relevant policy and practice recommendations. The conclusions are also aligned with the specific objectives with a particular focus on whether the research hypotheses were accepted or rejected by the study. The recommendations encapsulate suggestions meant to add value at both managerial and regulatory policy levels in accordance with the study findings. Finally, the chapter proposes areas for further research to address the gaps that could not be filled by the study due to time, cost and scope constraints.

5.2 Summary of Findings

This study examined effects of budgeting process on utilization of science instructional resources in secondary schools in Kenya. The study investigated the influence of policy framework and stakeholder in budget planning, budget monitoring and budget control; and the extent to which they affects availability of instructional resources; and how it affect utilization of instructional resources in science subjects instruction in Kenyan secondary schools.

5.2.1 Financial Management Policy and Utilization of Science Instructional Resources

The first objective examined the relationship between school financial management policy and utilization of instructional resources in science instruction. This was achieved by considering its existence in school financial management policy and its influence on budgeting guidelines, budgetary priorities, sources of resources and financial accountability. School financial management policy aims at facilitating achievement of educational goals by providing a framework for budgetary allocations for instructional resources for effective learning. The study found out that 73.50% of secondary schools in Nairobi County have financial management policies. This was confirmed by most principals and was more in evident in national schools, county and private secondary schools in that order. This is an indication that in secondary schools in Nairobi County, science teachers are involved in decision making leading to budgetary allocations for instructional resources. Further, the findings indicated that there is more likelihood for national schools to have financial management policy than county and private schools in Nairobi County.

Financial management policies provide budgeting guidelines as frameworks for overseeing, directing, conducting, regulating and controlling in instructional management in schools. This study established that 45.80% of secondary schools have objectives guiding budgetary allocation for science instructional resources in financial management policies. This was an indication that in about a half of secondary schools in Nairobi County, financial management policy did not have objectives guiding budgetary

allocation for science instructional resources. It was also established that county secondary schools are likely to have budgeting guidelines as frameworks for overseeing, directing, conducting, regulating and controlling in instructional management. However, there is a possibility that many science teachers could not have been aware of existence of a financial management policy in their institutions. This implies that science teachers in a number of secondary schools in Nairobi were not involved in financial issues in respective institutions

Kenya's secondary education is financed from various sources, depending on the types of the educational institutions and this should well be outlined in secondary schools financial management policies. On financing science instructional resources 44.6% of secondary schools in Nairobi County were found to depend on variety of sources beside FDSE funds. However, the fact that more than half of science teachers were either uncertain (43.4%) or disagreed (12.0 %) is an indication of limited involvement of science teachers in financial management issues. Secondly, results showed that acknowledging the use of alternative funding sources in budgetary allocation for instructional resources vary in different categories of secondary schools in Nairobi County. Specifically, there is an indication that public secondary schools finance science instructional resources from alternative funding sources. This is likely to happen in more established secondary schools which mobilize resources to supplement government funding and fees to boost instructional resources demands.

Findings from the study indicated that 47.0% of secondary schools in Nairobi have financial management policies providing standardized procedures in budgeting and sourcing for science instructional resources. This implies that such secondary schools have rules, regulation and guidelines for planning and utilization of instructional management. Further it is revealed existence of standardized procedure in most public institutions than private counterparts.

The results from the study indicated that 54.2% of secondary schools in Nairobi County had accountability provision in their financial management policies. Study findings revealed that 58.33% of private secondary schools have accountability provisions compared to 35.48% county and 50.00% national secondary schools. This was an indication that private secondary schools were more accountable and this could significantly influence utilization of instructional resources.

5.2.2 Stakeholders Participation in Budgeting Process and Utilization of Science Instructional

This was the second objective of this study which focused on the role of science teachers in budgeting process in regard to instructional management of Biology, Chemistry and Physics in schools. The extent to which science teachers are involved in the budgeting process for sourcing of instructional resources in Kenyan secondary schools was considered in terms of their participation in strategic planning, departmental meetings, and budgeting committee and in both pre and post-budget consultations.

One way science teachers would participate in budgeting process is setting out instructional management milestones during strategic planning. Findings of the study indicates that 32.50% of secondary schools in Nairobi County have strategic plans with objectives informing budgetary allocations for instructional resources, This is an indication that majority of secondary schools in Nairobi County have not fully embraced strategic plans as instructional management tools. Secondly, the study revealed that there is low participation of science teachers in strategic planning in Nairobi county secondary schools. This in turn creates a challenge for secondary schools in Nairobi County to build a mental bridge towards attainment of educational goals by linking financial leadership and budgetary allocations for instructional resources

The other way in which science teachers can participate in school budgeting process is through departmental meetings. The study results indicated that in 54.2% of secondary schools in Nairobi departmental meetings had a significant role on budgetary allocations for instructional resources in secondary schools in Nairobi County. From the study it was also established that in national secondary schools science teachers play bigger role in budgetary decisions on instructional resources through departmental meetings. However, in all categories there was significant participation of science teachers in school budgeting process through departmental meetings and this would influence utilization of science instructional resources in secondary schools in Nairobi County.

Thirdly, through budgeting committees, head of science or a representative teacher and those from other departments receive departmental priorities which are then consolidated

into final school budget. Findings of the study indicated in 44.6% of secondary schools in Nairobi County science teachers are represented in the budgeting committee on discussions leading into decision on budgetary allocations for instructional resources. The results also revealed that is more likely for science teachers in public secondary schools to be represented in school budgeting committee compared private schools. Findings showed that in 43.3% of secondary schools in Nairobi County science teachers participate in pre-budget consultations to influence budgetary allocations for instructional resources. The study also revealed that in 53.8% of secondary schools in Nairobi County teachers participate in post-budget consultations between budgeting committee and science department to reconcile pre-budget understandings with actual allocations. These findings indicate that more science teachers in public secondary schools than their private counterparts confirmed that post-budget consultations between budgeting committee and science department. These findings were an indication of the extent science teachers are in involved in financial management issues and particularly post-budget consultation is more evident in public schools. These variations in post-budget consultations between budgeting committee and science department among other factors could have a negative significance on learning achievements in science subject in private secondary schools than in public ones

To ensure that school budget effectively address issues to do with instructional resources science teachers should participate in pre-budget consultations between budgeting committee and science department.

5.2.3 Budget Planning Procedure and Utilization of Science Instructional Resources

This was the third objective of this study and it focussed on setting objectives, determining resources, soliciting requests, determining projections and cost to enhance effective management of school resources to realize educational goals. Strategic considerations influence the way money is allocated at in secondary schools to enable realization of instructional goals.

Findings from the study indicated that 41.00% of secondary schools in Nairobi County have budgeting objectives that take in consideration science instructional resources. The results also revealed that in public secondary schools were more likely to have budgeting objectives that guide resources allocations as far science instruction was concerned than in their private counterparts.

During budget planning requests should come from all departments and sections within the institution. Findings from the study indicated that in 48.2% of secondary schools have instructional resources budgetary request based on science teachers' schemes of work. In terms of institution categories, the results revealed that mostly in county secondary schools budgetary request are based on schemes of work as compared to their counterparts in national and private categories. It key to note that financial management policy in a school is crucial in outlining use of funds and should enhance prioritization to avoid wastage and misappropriation

The findings of the study indicated that in 44.4% of secondary schools in Nairobi County science teachers are represented in budgeting committee during prioritization on instructional resources list. Representation of science teachers in budging committee enables them to understand different budgetary trade-offs that would require review of instructional resources requirement to ensure appropriate utilization. This suggested that science teachers in county secondary schools were more likely to be represented during prioritization than both national and private counterparts. However, representation in budgeting committee is determined by financial leadership approach of an institution.

Once all sections and departments have had an opportunity to meet with the budgeting committee or have their material received by the committee, the information is assembled into budget alternatives. Findings from the study indicated that 49.4 % of secondary schools in Nairobi County had a system for projecting revenues and expenditures that links financial management policy objective to science instructional resources. This focus is on where investment will be made and aligns the overall financial commitment of the projected resources that will be available. Further the study established that there is a greater certainty of existence of a system for revenue and expenditure projection in national secondary schools.

Finally, there is pressure on secondary schools to effectively and efficiently run for long-term institutional sustainability while responding to the demands for public accountability. Findings indicated that in 45.8% of secondary schools in Nairobi County allocation for science instructional resources are specified in budgets. These findings

indicate that financial budgets in most county secondary schools have allocations for instructional resources specified and that there was more uncertainty among science teachers from private secondary on specified. The response is an indication that budgetary allocations for instructional resources are given as a block in most secondary schools in Nairobi County.

5.2.4 Budget Monitoring Process and Utilization of Science Instructional Resources

This was the fourth objective of the study and it focussed on setting benchmarks, delineation of allocations, procurement management, and expenditure reports and budget reviews. Much of the debate has focused on the instructional practices that will enable all students to achieve better learning outcomes in science subjects.

Setting the benchmarks is important in assessment of performance against allocation and progress of the budget in instructional management. Findings indicated that in 42.1% of secondary schools in Nairobi County, Science teachers are involved in benchmarking for instructional resources. Involving science teachers helps in ensuring the right quality and quantity are delivered for utilization in the class. This in turn will ensures that budgetary allocations are spent without wastage or diversion for the purpose of successful instructional managements in secondary schools

One budget performance indicators is specific type and quantity of science instructional resources needed in each class. Findings showed that in 38.5% of secondary schools in Nairobi county have budgetary allocation for sciences instructional resources are

delineated per subjects the per class. This low number was attributed to ineffective budgetary information management is some secondary schools in Nairobi County. With effective information management, budgetary allocations for science instructional resources could easily be delineated per class. It was however established that most county category of secondary schools have instructional resources budgetary allocation delineated.

Findings indicated in 45.8% of secondary schools in each term at departmental level, they plan for procurement of instructional resources. These findings are an indication that public procurement reforms which were initiated in 2005 to enhance efficiency in the management of financial resources has not fully bore fruits in public schools. Further, these results indicated that in county secondary schools, science teachers were more likely to have termly procurement planning compared to other categories of schools.

Financial records are used for generation of budget monitoring reports which then provide vital information about spending patterns on resources. This study found out that in 43.4% of secondary schools in Nairobi County there are expenditure records of transactions involving instructional resources. These findings also indicate that a larger number of science teachers from private schools agreed that expenditure records for instructional resources are kept at the departmental level. Instructional resources' expenditure record keeping touches on accountability

Effective budget monitoring would show how much of the budgetary allocations for instructional resources for science have been spent at a given time. Findings showed that 38.4% of secondary schools have science teachers involved in budget review to address demands for instructional resources. Further, results show that public secondary schools are more likely to have science teachers playing a role in budget reviews. This in turn would go a long way in ensuring quality instruction through appropriate utilization of science instructional resources in secondary schools. Further, appropriate utilization of science instructional resources would ensure realization of good learning outcomes in sciences. It also turned out that clearly there is greater participation of science teachers in budget reviews in public schools than their private counterparts.

5.2.5 Budget Control Mechanisms and Utilization of Science Instructional Resources

This was the fifth objective of the study and it focussed on requisition procedures, spending authorization, transaction records, payments confirmation, reconciliation of purchases, and auditing.

The findings showed in 36.1% of secondary schools have pre-designed requisition procedure for sourcing of instructional resources. It is expected that more established county secondary schools should have good financial management practices being undertaken, same with those private category having management that are more responsive to instructional need of students.

Findings showed that in 68.6% of secondary schools in Nairobi County principals must authorize spending on instructional resources. In practice, some secondary schools delegate responsibility to bursars, head of science department and sometimes deputy principals. This is possible in national secondary schools because they are more established and have systems with standardize procedures. Delegated authority is also possible in more established county and private secondary schools..

Findings indicate that in 53.0% of secondary schools in Nairobi County, copies of orders and delivery notes for science instructional resources are at the departmental level. This is useful in tracking consumption of instructional resources at a given period of time without necessarily showing how much have been spent. It enables tracking consumption of instructional resources without necessarily showing how much have been spent. This is an indication that majority of science teachers who disagreed came from private secondary schools. As much as records of orders and delivery notes may not reveal a lot financially management of private secondary schools may still want to keep them away from the staff.

From the study showed that in 55.4% of secondary schools in Nairobi County science teachers play a role in ascertaining the quality and quantity of instructional resources supplied before any payment could be made. The results indicate that in most secondary schools science teachers check quality of instructional resources on delivery before any payment is done. Participation of science teachers in verifying quality and quantity of

instructional resources would have a positive influence on utilization. From these results it can be concluded that participation of scinece teachers in quality and quantity verification before paymnet for instructional resources is done was not dependant on seconadry schools category in Nairobi county. It could be concluded that any diffrence in level of sceince teachers participation could be attributed to financial leadership style amd instructional managemnet approcah in specific seconadry schools in Nairobi County.

Results indicated that in 39.7% of secondary schools in Nairobi County has the practice of purchase reconciliation at the departmental levels. With limited or no participation of science teachers in reconciliation of purchases, deviations from budgetary allocations negatively impact on utilization of instructional resources. This could be explained from the fact that unlike public secondary schools which are required to adhere to provisions of Public Procurement and Disposal Act 2005, private ones are not obliged to follow PPDAA.

5.2.6 Utilization of Instructional Resources and Performance in Science Subjects

Through testing of the set hypothesis, this study established significant relationship between utilization of instructional resources and performance in science subjects in secondary schools. However, the following findings are of great importance. Instructional resources include books, science equipment, audiovisual equipment, charts, writing boards and other educational materials that are required for effective learning of biology physics and chemistry. Utilization of instructional resources in secondary schools is key in achievement of its educational goals. In general, the learning outcome is influenced by appropriate utilization of instructional resources. According to the response of science

teachers the most often utilized instructional resources in biology is chalkboard. Occasionally, they utilized textbooks, projector, computers, whiteboard, handouts, pamphlets, charts, models, calculators and specimen.

In physics the most often utilized instructional resources are chalkboard and text books in secondary schools. The irony of these results is that practical activities are the least used among physics teachers. Chemistry teachers' response on utilizations reflects a wide use of chalkboard, text books and whiteboards with low utilization of practical activities and specimen in teaching chemistry as already seen in the other two science subjects. The shift from practical work in teaching chemistry and other science in Nairobi secondary school could be benefiting from emergence of affordable computers. Computers are emerging instructional resources and schools could gradually be stocking them annually and once stocked, budgetary allocation will be for maintenance that will include repairs and acquisition of accessories such as softwares.

The responses on availability of instructional resources, similarities exist between science teachers and students in agreement in three areas. Science teachers and form four students agreed that reference books, manila, dusters and chalk and laboratory equipment were available in secondary schools in Nairobi County. Availability of these instructional resources give Science teachers the opportunity for both chalk-and-talk and practical work approach in teaching. However, difference in laboratory specimen was an indication that most science lessons are characterised by chalk-and-talk and little practical work.

5.3 Conclusion

The study established that secondary schools in Nairobi have financial management policies, teachers participate in budget planning, monitoring and control. First, the study concludes that there no significant relationship between school financial management policy on utilization of instructional resources in science instruction in secondary schools in Nairobi County. Secondly, the study concludes, the study concludes that there is significant effect of stakeholders' participation in budgeting process on utilization of instructional resources in science instruction in secondary schools. If follows that any improvement in stakeholder participation in the school improves utilization of science instructional resources in in secondary schools. Thirdly, the study concludes that there is a significant relationship between budget planning procedure and utilization of instructional resources in science instruction in secondary schools. Therefore any improvement in Science teachers' role in budget planning process in the school will improve utilization of instructional resources.

Fourthly, the study concludes that there no significant effect of budget monitoring process on utilization of instructional resources in science instruction in secondary schools. Fifthly, the study concludes that there no significant effect of budget control mechanisms on utilization of instructional resources in science instruction in secondary schools. Finally, the study concludes that there no significant relationship between utilization of instructional resources and performance in science subjects in secondary schools. Utilization of Instructional Resources was found not to have a significant effect on performance of science subjects

5.4 Recommendations

Several recommendations are proposed as a result of the findings and conclusions made by the study. The recommendations are made managerial practice, policy and areas further research.

5.4.1 Managerial Practice

At managerial level, the recommendations provide guidelines to principals as both financial and instructional managers.

a. Secondary school need to domesticate government guidelines and regulations on resource management into institutional financial policies to guide budgeting process and provide accountability measures. This would enable science teachers need to be involve in decision making on instructional management related process from strategic planning, budget planning, budget monitoring and budget control.

b. Secondary school principals need to decentralize decision making through delegation to departments in effort to improve instructional management. With more responsible departments and particularly of science, improved learning outcome will be realized. This would enhance capacity of science departments in secondary schools to deal with financial related issues in instructional management. Secondary school leadership need to organized training for departmental heads on basic financial managements principles to boost budgeting process

c. Budgeting processes should take a consultative and collaborative approach first to ensure adequate allocation for instructional resources and secondly to appropriately spend what has been allocated to enhance learning. Secondary schools budgeting committee should seek to channel resources to the educational activities which will have the greatest impact and are likely to enable realization of instructional goals.

d. Secondary schools need effective information management system to closely check and monitoring of financial records for sourcing of instructional resources up to departmental level. This will not only enhance accountability, but also reduce virement and wastages. Budgetary allocations for instructional resources should be delineated per class per subject from form one to four. With delineation of budgetary allocation per class, there will appropriate utilization of instructional resources at all levels to enhance learning in sciences

e. Requisition procedures for science instructional resources should be standardized to enable all whether new or old in the institution to get involved appropriately in sourcing for teaching and learning materials. Confirmation quality and quantity of supplied instructional before payment should be done through defined system from the subject teacher through head of science department to the principal.

5.4.2. Policy

At policy level, the recommendations are aimed at bringing to light the need to institute appropriate regulatory mechanisms meant to enhance instructional management in terms of budgetary allocation and utilization.

a. There is need for the government through both the TSC and country directors to ensure that all secondary schools have a financial management policy which conforms to provisions of Constitution of Kenya (2010), Public Procurement and Disposal Act 2005, Basic Education Act 2012, Public Finance Management Act 2012 and other related legal instruments to guide budgetary allocation for instructional resources
b. Secondary schools should be compelled to have strategic plans as roadmap toward successful instructional management. This need to have realizable milestones towards improving utilization of instructional resources. This would enable secondary schools to build a mental bridge towards attainment of educational goals by linking financial leadership and budgetary allocations for instructional resources
c. For the purpose of quality control in science instructional management MOEST need to come up with mechanisms of approving budgets of secondary schools
d. To enhance appropriate management of resources in secondary schools to benefit science instruction, MOEST need to increase its supervisory capacity
e. Training on financial management should extent up to deputy principals and heads of departments to improve budget control in secondary schools/

5.4.3 Further Research

This study recommended the following areas for further research

a. Relationship between schools instructional management policy and performance in science subjects in secondary schools

b. Role of science teachers in improving learning outcomes through instructional management decision making

c. Role of strategic plans as roadmap toward successful instructional management

d. Effects of decentralization in instructional management decision making in science instruction.

e. Competence of science teachers in dealing with financial related issues in instructional management

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APPENDIX ONE
QUESTIONNAIRE FOR SCIENCE TEACHERS

Budget is an important component of school management focusing on allocation of resources for instruction across school curriculum. Prudent allocation of resources assures even distribution of available finances to procure instructional resources to boost learners' achievements across subject areas in secondary school curriculum in Kenya. Inappropriate distributions of resources negatively skew finances which lower instructional capacities teaching and learning. You have been identified as a key respondent in establishing the distributive capacities of school resources to enhance learners' achievement through budgetary process.

Section A: Background information

Please Tick (√) to mark the answer that most closely resembles your position

Gender	Male				Female						
Academic Qualifications	Diploma		Graduate			Post Graduate					
Age	≤30		31-40		41-50		Over 50				
Experience (Years)	<5		6-10		11-15		16-20		>20		
Years in the School	<5		6-10		11-15		16-20		>20		
School Age (years)	0-10		11-20		21-30		31-40		>40		
Number of Streams	1-2		3-4		5-6		7-8		>8		
School Type	BB	GB	BD		GD		MD		MB		
School Category	National		County				Private				
No. of Science Teachers	Biology		Physics				Chemistry				
Teaching Subject	Biology		Physics				Chemistry				

BB: Boys Boarding, GB: Girls Boarding, BD: Boys Day, GD: Girls Day, MD: Mixed Day, MB: Mixed Boarding

Section B. Budgeting for Instructional Resources
Indicate the extent to which you agree or disagree as a science teacher on the following aspects of budgeting process critical in sourcing for instructional resources in your school.

1-Strongly Dis-Agree 2– Dis-agree 3 – uncertain 4 – Agree 5- Strongly Agree

	STATEMENT	1	2	3	4	5
1.0	**Policy Framework and Budgeting Process**					
1.1	School has a financial policy informing budgeting process.					
1.2	School financial policy have set objectives that inform budgetary allocations for the instructional resources for science subjects.					
1.3	All expected resources including fees, grants and subsidies are considered in budgetary allocation for science instructional resources.					
1.4	Management procedures for sourcing science instructional resources					

	are standardized according to laid down practices.					
1.5	Policy provided guidelines for accountability in sourcing of instructional resources exists in the school.					
2.0	**Stakeholder Participation in Budgeting Process**					
2.1	Science teachers take part in school strategic planning where objectives informing budgetary allocations for instructional resources are set.					
2.2	Science teachers participate in Budgeting through Departmental Meetings					
2.3	Science teachers are represented in the school budgeting committee					
2.4	There are pre-budget consultations about budgetary priorities between budgeting committee and science department					
2.5	There are post-budget consultations between budgeting committee and science department to reconcile pre-budget understandings with actual allocations.					
3.0	**Budget Planning Process**					
3.1	Budgeting objectives take science instructional resources in consideration					
3.2	Science teachers place their budgetary request based on their schemes of work					
3.3	Science teachers are present during budgeting committee meeting when prioritization on departmental list of instructional resources to be included in the budget.					
3.4	System for projecting revenues/expenditures established to link policy objective on science instructions and resources.					
3.5	Allocations for science instructional resources are specified in School Budget					
4.0	**Budget Monitoring Process**					
4.1	Benchmarks for sourcing of instructional resources are set in terms of quality and quantity required					
4.2	Budgetary allocation for sciences instructional resources are delineated per subjects the per class form 1-4.					
4.3	Each term science department draws up a procurement plan for instructional resources					
4.4	Record of transactions on science instructional resources kept and periodic reports produced					
4.5	Science teachers participate in periodic budget reviews to incorporate changes in instructional resources demand.					
5.0	**Budget Control Mechanisms**					
5.1	There are pre-designed requisition procedures for science instructional resources.					
5.2	Orders for science instructional resources are approved by the principal to give authority for delivery.					
5.3	Records of all orders and copies of delivery notes for science instructional resources are kept at the department					
5.4	Science teachers check quality of instructional resources on delivery					

	before any payment is done.					
5.5	There is regular reconciliation of purchases on instructional resources at departmental level.					
5.6	There are audit trails to enable source documents to be traced to financial statements and vice versa.					

Section C: Budgeting Process

Briefly outline how the following are undertaken and who are involved

Formulation or review of school financial policy	
Stakeholder participation in budgeting for science instructional resources	
How budgetary allocation for science instructional resources is arrived at	
Ensuring that funds allocate for science instructional resources are used to source for them as much as possible	
How are orders for science instructional resources done until they are made available in the classroom	

Comment how budgeting process can be improved to improve utilization of instructional resources in the school

_____
_____
_____
_____

Section C: Utilization of Instructional Resources

The following are aspects of utilization of instructional resources. How frequently do you use the following media in class? Please choose one of the following positions

Often (1) Occasionally (2) Rarely (3)

	Media	**1**	**2**	**3**
1	Charts			
2	Models			
3	Chalkboard			
4	Practical			
5	Specimens			
6	Whiteboard			
7	Projector			
8	Text Books			
9	Handouts			
10	Pamphlets			
11	Computers			
12	Calculators			

1.Which of the above instructional resources you find easy to use during class instruction_____
_____
_____
_____
_____

2. Comment of the factors affecting utilization of instructional resources in your school_____
_____
_____

_____3. Comment on factors hindering effective utilization of instructional resources in your school_____
_____
_____
_____
_____

APPENDIX TWO

QUESTIONNAIRE FOR FORM FOUR STUDENTS

Budget is an important component of school management focusing on allocation of resources for instruction across school curriculum. Prudent allocation of resources assures even distribution of available finances to procure instructional resources to boost learners' achievements across subject areas in secondary school curriculum in Kenya. Inappropriate distributions of resources negatively skew finances which lower instructional capacities teaching and learning. You have been identified as a key respondent in establishing the distributive capacities of school resources to enhance learners' achievement through budgetary process

.

Section A: Background information

Gender	Male		Female				
Science Subjects you are taking	Biology		Physics		Chemistry		

Section B. Utilization of Instructional Resources

How frequently are following media used in class during science lessons? Please choose one of the following positions 1 to 3.

Often (1) Occasionally (2) Rarely (3)

Science Subject		**Biology**			**Physics**				**Chemistry**			
	Media	**1**	**2**	**3**	**Media**	**1**	**2**	**3**	**Media**	**1**	**2**	**3**
01	Charts				Charts				Charts			
02	Models				Models				Models			
03	Chalkboard				Chalkboard				Chalkboard			
04	Practical				Practical				Practical			
05	Specimens				Specimens				Specimens			
06	Whiteboard				Whiteboard				Whiteboard			
07	Projector				Projector				Projector			
08	Text Books				Text Books				Text Books			
09	Handouts				Handouts				Handouts			
10	Pamphlets				Pamphlets				Pamphlets			
11	Computers				Computers				Computers			
12	Calculators				Calculators				Calculators			

Comment on what you consider is most critical instructional resource in learning science in school

_____

_____

What do you think should be done to improve utilization of instructional resources as a way of improving students' achievements in sciences?

APPENDIX III: INTERVIEW GUIDE FOR PRINCIPALS

Budget is an important component of school management focusing on allocation of resources for instruction across school curriculum. Prudent allocation of resources assures even distribution of available finances to procure instructional resources to boost learners' achievements across subject areas in secondary school curriculum in Kenya. Inappropriate distributions of resources negatively skew finances which lower instructional capacities teaching and learning. You have been identified as a key respondent in establishing the distributive capacities of school resources to enhance learners' achievement through budgetary process.

Section A: Background Information

Gender	Male				Female					
Qualifications	Graduate				Post Graduate					
Experience (Years)	<5		6-10		11-15		16-20		>20	
Years in the School	<5		6-10		11-15		16-20		>20	
Number of Teachers	<10		11-20		21-30		31-40		>40	

Section B. Policy Framework and Budgeting Process

1. Does the school have budgeting policy?
2. Is Does this policy related to budgetary allocation for instructional resources for science subjects?
3. Under FSE policy, the government allocated Kshs. 10,265 per student out of which Tuition is given Kshs: 3600. Is this adequate as far as school instructional management is concerned in the school? If not how do you fill the gap?

Stakeholder Participation in School Budgeting Process

1. Does the school have a budgeting committee? Who are the members and their roles?
2. Briefly comment on both pre and post budget consultations about budgetary priorities between the school management and science department

Budget Planning Process

2. During school budgeting process is there a specific allocation for instructional resources
3. Are budgetary allocations for instructional resources done per specific subject or for all sciences

Budget Monitoring Process

1. Are there specific procurement plan for instructional resources each term? Who does it?
2. How often does periodic budget reviews take place in your school to incorporate changes (monthly, every term, weekly, rarely)
3. How does the school collect, analyse and report to verify compliance to budget allocations

Budget Control Mechanism

1. What is the school's accounting policy in regard to acquisition of instructional resources for learning science
2. What mechanisms are there to ensure that the schools get value for money when spending and especially on sourcing of instructional resources for learning science
3. How variance in spending addressed in the school to ensure it does not affecting sourcing for instructional resources for learning sciences