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Influence of Risk Management Practices on Successful Implementation of Projects in Public Secondary Schools in the County Government of Kiambu, Kenya

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Abstract:
Projects are exposed to a wide variety of risks. Consequently, projects manager should embrace best practices in risk management in order to increase the probability of successful implementation of projects. Literature suggests that incorporating risk management best practices in the management of projects leads to better project outcomes. The aim of this study was to examine risk management practices of public secondary schools in the County Government of Kiambu and how these practices affect the successful implementation of school projects. The study targeted 246 public secondary schools from which a sample of 74 schools was obtained using the proportionate stratified sampling technique. Data was collected from the principals or deputy principles of these schools using structured questionnaires, and analyzed using both descriptive and inferential statistical techniques. Findings revealed that risk identification, risk analysis, risk treatment, and risk control have a significant and positive relationship with successful implementation of project. Risk treatment (Beta= 0.559) had the strongest influence on project implementation success followed by risk analysis (Beta=0.549). The researcher recommended that policy makers in the education sector should develop risk management training programs that focus on the four risk management processes. School management teams should also focus on developing written project risk management policy and procedures, and involve stakeholders in the risk management processes.

Keywords: *Risk, risk analysis, control, project implementation, risk treatment, risk identification*

1. Introduction

1.1. Background of the Study

Risk is an inevitable element in any undertaking. A risk is an event that has a probability of occurring and, if it occurs, has an impact on a person, organization, or any other entity (Project Management Institute, 2013). This definition implies that for any event to qualify as a risk it must have a probability of occurring and an impact when it occurs. The impact may either be negative such as loss of property as result of a fire or positive such as reduction in cost of input as a result of changes in foreign exchange rate. On the other hand, risk management is a systematic process that entails identifying risks, analyzing risks, treating risks, and monitoring and reviewing risks (Kendrik, 2009). It is not a static or a one-time event, but a continuous and progressive process where the risk management team expected to revise and refine strategies as situations change.

According to Heldman (2013), risk management is an iterative process that requires managers to go back and reexamine the needs and requirement of the organization, as well as, changes in the environment in which the organization operates. The goal of risk management is to reduce the probability and impact of negative risks and increase the probability and income of negative risks (Kendrick, 2009). All projects have a certain degree of risk; hence, risk management is an importance activity when it comes to managing projects. According to the Project Management Institute (2013), risk management is one of the knowledge areas that are important to project managers.

The subject of risk management in projects has received attention from researchers in various parts of the world. In Brazil, Junior and Carvalho (2013) examined risk management practices among 415 projects spread across different industrial sectors and several states. Results of the study revealed that adopting best practices in risk management had a significant positive impact on project success. Serpella, Ferrada, Howard, and Rubio (2013) examined risk management practices among construction projects in Chile. Results of

the study showed that owners and contractors did not use systematic risk management practices resulting in negative consequences for the construction projects.

In the United States, Kutsch and Hall (2010) examined risk management practices of a sample of IT project managers. Results of the study revealed that in some projects, risk management practices were shaped by deliberate ignorance of project managers. Findings showed that factors such as utility of risk related information, indecisiveness, and suspension of beliefs had water down the risk management process into an administrative exercise that had to impact on project outcome. Didraga (2013) examined how risk management processes affected the subjective and objective performance of IT projects among a sample of Romanian IT companies. Results showed risk management process had a significant positive effect on both the subjective and objective performance of IT projects. Findings showed that risk management processes help to create awareness, clarify expectations, create acceptance and commitment, and establish trust and priority among project teams leading to a higher probability of success.

There is also a variety of studies conducted in the African context to examine project risk management practices. Wet and Visser (2013) evaluated the impact of risk management on the success rate of software projects in South Africa. Results showed that, where prudent risk management practices were applied, software projects produced better results. Augustine, Ajayi, Ade, and Adakole (2013) examine the risk management practices in Nigerian construction industry with aim of establish a risk management index. They found that the Nigerian construction industry was exposed to 53.04% risk leading to high failure rate of construction projects. In their study, Mujabi, Otengei, Kasekende, and Ntayi (2015) examined the influence of risk management on successful implementation of donor-funded projects in Uganda. Results showed that risk management had a significant impact on the success of the donor-funded projects.

In Kenya, Kinyua, Ogollah, and Mburu (2015) examined the influence of risk management strategies on project performance of small and medium scale information communication technology enterprises. Findings showed that there was a positive relationship between risk management strategies and ICT project performance of the SMEs. It was revealed that risk management practices encouraged the ICT enterprises to identify and quantify risk and consider risk containment and reduction policies. Kipyegen, Mwangi, and Kimani (2012) examined risk management practices of 62 Kenyan software project managers and developers. Results revealed that the project managers and developers did not use formal risk management techniques as most organization had not put in place measure for the implementation of formal risk management methods.

In their study, Kariungi (2014) found major flaws in the risk management practices had a significant negative effect on the completion of Kenya Power and Lighting Company projects in Thika. The study revealed inadequate risk management led to procurement delays, untimely availability of fund, and interference of projects by climatic factors. Gwaya, Masu, and Wanyona (2014) examined causes of project management failures in the Kenya construction industry. Data was collected from a sample of 500 respondents comprising of architects, quantity surveyors, project managers, contractors, and engineers. Results showed that risk management practices were among the factors that contributed to project management failures. In his study involving 24 constituency development fund (CDF) projects in Juja constituency, Wachuru (2013) found that there was minimal application of risk management practices in the CDF projects limiting the success of these projects.

1.1.1. Successful Implementation of School Projects

Project success is a rather elusive concept. Different scholars and practitioners have varying ideas of what constitute project success. In most cases, projects are considered to be successful when they meet three requirements: completed on time, completed within budget, and meet the required functionality (Wachuru, 2013). However, Prabhakar (2008) emphasized the need to distinguish between project management success and project success. He explained that the three criteria of cost, time and quality are measures of project management success, and that project success is best measured against the attainment of the overall objectives of the project. Today, there is increased emphasis for the development of multi-dimensional approaches for measuring project success.

Other recommended measures of project success include ability to satisfy the expectations of all stakeholders, extent to which they promote personal growth of project team members, their impacts on users, and their implication on future projects. Kylindri, Blanas, Henriksen, and Stoyan (2012) argued that a project can only be considered successful if it meets technical performance specifications or the mission for which it was created, and if there is a high level of satisfaction among stakeholders regarding the project outcomes. According to Odhiambo and Ngugi (2014), successful project need more than proper planning and tight control; it is also important for project to generate energy, commitment, and creativity among people who involve in their planning and implementation. Project risk management help projects to generate this commitment and creativity by inspiring confidence among the project team members.

1.1.2. Public Secondary Schools in Kenya

Education in Kenya is based on the 8-4-4 system, where children go through eight years if primary education followed by four years of secondary education, and another four years of university education (Kinuthia, 2009). Public secondary schools play a critical role in the provision of secondary-level education as the account for 75% of all secondary schools in Kenya. There were approximately 4,018 public secondary schools in Kenya as at June 2015 (Government of Kenya, 2015). Approximately, 18 of these were national schools, 1000 were provincial, and 3000 were district schools. Public secondary schools are mainly funded by the government, but communities also contribute to the funding of these schools. The schools are managed through a board of governors (BOGs), but school principals assume the most responsibility in managing these institutions.

In 2008, the Kenyan government launched a program for subsidizing secondary education resulting in a significant increase in the population of student in public secondary schools (Kinuthia, 2009). The increase in student population overstretched physical facilities within the schools creating the need to construct new classrooms, dormitories, laboratories, pit latrines, libraries, dining halls, and

other facilities. In their studies, Mbayah and Maende (2014) found that public secondary schools in Sabatia Sub-County in Vihiga County were experiencing challenges such as inadequate funding, late disbursement of funds, and delays in construction when it comes to implementation of infrastructural projects.

In their study involving 30 principals, 238 teachers, and 2400 students from Mwingi Central District, Musyoka (2013) found that public secondary schools the region did not have adequate physical facilities such as classrooms, toilets, desks, library, and laboratories. Findings of the study also established that the lack of adequate physical facilities had a negative impact on academic performance of students. Mingaine (2013) noted that Kenyan secondary schools barely use ICT tools to manage the quality of their output, reduce costs, and manage teacher productivity due to challenges associated with implementing ICT projects. The study involving 350 public secondary school principals in Meru County revealed that ICT projects are not properly implemented within schools leading to low adoption rate.

1.2. Problem Statement

Approximately 57% students who complete primary-level education continue to secondary school. The low transition rate has largely been attributed to lack of capacity in existing secondary schools. The quality of education in the public secondary schools has also deteriorated since the introduction of the subsidy program in 2008 as physical facilities with the schools have become inadequate to cover the surging student population. In Kenya vision 2030, the government expressed the intension to increase capacity of secondary schools so as to attain an enrollment rate of 95% by the year 2030. The government also envisioned establishing computer programs that will enhance standards of education and equip students with modern ICT skills. Projects are bound to play a significant role in the realization of the government's vision. However, the extent to which this vision will be realize will be determined by the level to which project implementers in secondary schools are able to manage these projects and risks that come with them successfully.

1.3. Research Objectives

To examine the influence of risk management practices on successful implementation of projects in public secondary schools in the County Government of Kiambu.

1.3.1. Specific Objectives

i. To examine the influence of risk identification practices on successful implementation of projects in public secondary schools in the County Government of Kiambu.
ii. To determine the influence of risk analysis practices on successful implementation of projects in public secondary schools in the County Government of Kiambu.
iii. To determine the influence of risk treatment practices on successful implementation of projects in public secondary schools in the County Government of Kiambu.
iv. To determine the influence of risk control practices on successful implementation of projects in public secondary schools in the County Government of Kiambu.

1.4. Research Hypotheses

i. H_0: There is no significant relationship between risk identification practices and successful implementation of projects in public secondary schools in the County Government of Kiambu.
ii. H_0: There is no significant relationship between risks analysis practices and successful implementation of projects in public secondary schools in the County Government of Kiambu.
iii. H_0: There is no significant relationship between risk treatment practices and successful implementation of projects in public secondary schools in the County Government of Kiambu.
iv. H_0: There is no significant relationship between risk control practices and successful implementation of projects in public secondary schools in the County Government of Kiambu.

1.5. Significance of the Study

This project will be beneficial to the country's education as it will increase access to and quality of education by improving how public secondary schools manage projects. This improvement will lead to expansion of physical and technological facilities. Findings of these studies are also expected to highlight the risk management practices of public secondary schools and how these practices affect the performance of projects with the school. This knowledge will enable policy makers to create programs aimed to improving the risk management competencies of school's management teams in public schools.

The project is also expected to benefit individual schools by increasing the quality of education, school performance, and cost associated with implementing projects. By improving the risk management capabilities of project implementers within secondary schools, findings of this study are bound to improve the quality of infrastructure with the schools leading to enhanced learning and improved academic performance. In addition, risk management competencies of school management will reduce the cost associated with implementing projects in the schools.

The project will also benefit individual researchers by adding knowledge on the subject of risk management and how it contributes to project success. The findings of this study are expected to enrich theory and literature of project risk management practices. The findings are also expected to raise new questions and issues that will inform further studies on the subject of project risk management.

1.6. Scope of the Study

The study focused on four main risk management variables: risk identification, risk analysis, risk treatment, and risk control and review. The project only involved principals and deputy principles of public secondary schools located within the County Government of Kiambu. The data collected process took place between February and March 2016 with a budget of Ksh 70,500.

1.7. Limitation of the Study

A major limitation of the study was the reliance on self-reported data from the principals and deputy principals. According to Kothari (2004) relying on self-reported data exposes the study to bias associated with exaggeration, selective memory, and provision of inaccurate information. In order to overcome this limitation, the researcher assured participants that their anonymity and confidentiality will be maintained. The researcher also encountered problem of accessing participants because of the busy schedule. The researcher overcame this limitation by dropping-off the questionnaires personally and making persistent follow-ups.

2. Literature Review

2.1. Theoretical Review

Theories play a critical role in the research process as they provide researchers with a tool for guiding data collection, analysis, and interpretation tasks (Wolf, 2015). They provide the frame of reference that forms the basis for observation, definition of concepts, development of research design, and interpretation of findings. This sections reviews theories that are related to the subject of project risks management.

2.1.1. Enterprise Risk Management Theory

Enterprise Risk Management (ERM) is a risk management theory that advocates for the measurement and management of all significant risks facing a given entity holistically rather than the management of each risk independently (Nocco & Stulz, 2006). It seeks to aggregate the risk management silos within an organization into one comprehensive and holistic framework. The ERM framework of managing risk emphasizes the active involvement of senior company executives and participation of all employees in the risk management process of identifying analyzing, and responding to a wide range of company risks (Hallowell, Molenaar, & Fortunato, 2013). This concept encourages entities to shift from the paradigm where the exercise for managing risks is left to one or a few people to a paradigm where all members of the organizations are involved in the management of risks.

The ERM model also emphasizes the need for clear policies and processes for managing risks. The theory contends that organizations can improve their risk management capacity having formal polices that define their risk appetite and tolerance, strategic goals, and systematic processes for identifying, analyzing, treating, and controlling risks (Olson & Wu, 2010). It also emphasizes the creation of a risk management culture where all stakeholders are mutually accountable and empowered to manage risks. ERM practices are associated with increased stakeholder confidence, increased competitive advantage, and long-term viability of organizations (Cormican, 2015). Although the ERM model was developed for use in managing company risks, it has become popular in the project management sphere.

This theory proposes that when examining the project risk management practices among schools in the county government of Kiambu, the research should pay attention to the extent to which the schools have created common structures and approach for managing risk, introduced accountability in the process of managing risk, promoted communication of risk information, and facilitated constant review of both risk and risk remedies. According to this theory, the research should also examine the extent to which schools in Kiambu have formal policies for identifying, analyzing, treating, and reviewing risks, as well as, the extent to which key stakeholders are involved in these risk management activities.

2.1.2. Logical Framework Approach

The Logical Framework Approach (LFA) is a model that is commonly used by large international assistance organizations to plan and manage development projects. The tool was developed in 1970 using ideas from Peter Drucker's Management by Objectives (Nadel, 2008). This framework uses a top down, waterfall approach for planning project activities where planners begin by defining the goal of the project, then use the goal to develop the expected outputs of the project, identify activities required to achieve the objectives, and finally resources or inputs required to perform the activities.

The LFA also require planners to identify indicators of achievement, means that will be used to verify results, as well as, risks and assumptions that underlie the projects. This final component that requires project planners to identify risks and assumption is what makes the LFA a useful model for managing project risks (Odhiambo & Ngugi, 2014). In this case, the project team is compelled to think about and prepare for the risks that the project is expected to encounter before the commencement of the project implementation phase. The LFA requires the project team to undertake some form of risk assessment in order for them to receive funding for their project.

The LFA model suggests that, in order to understand the risk management practices of public secondary school in the County Government of Kiambu, the researcher should examine the extent to which these schools use a structured and systematic process of managing projects. The framework suggests that for the schools to manage their projects effectively, the must decompose them into the basic activities in order to identify the input required to implement the projects (Karogo & Orodho, 2014). A good understanding of the inputs will enable stakeholders to identify potential risks.

2.1.3. Network Theory

Network theory is a theory that is used to explain the structure and functioning of social systems. This theory views social systems such as companies or projects as networks that comprises of points/ nodes and lines connecting these nodes (Fang, Marle, Zio, & Bocquet, 2015). For instance, in a given project, the nodes may include project team members, the project manager, suppliers, regulators, financiers, beneficiaries, and the project owner. These nodes are connected by various relationships such supplier-buyer relationship, financing, legal, and working relationships. The theory explains that modifications or disturbances in any node or line within the network cause a ripple effect on all other lines and nodes.

The network theory is often used in risk management to explain and inform the process of risk analysis. This theory emphasizes the need to take a systematic approach when analyzing and understanding risks rather than focus on the impact of the risks on one component of the project (Zingrand, 2010). It encourages project teams to consider how various components of the projects are interrelated and how interference in one component will affect the other components of the project. This perspective of analyzing risk enables project teams to come up with a more realistic and holistic evaluation of the impact of certain risks.

This network theory suggests that, in order to judge the effectiveness of project risks management practices of public secondary schools in the County Government of Kiambu, the researcher should examine the extent to which these practices are comprehensive. The researcher should examine the techniques used by the schools to analyze impacts of risks and whether these techniques consider the systemic impacts on risks.

2.1.4. Theory of Planned Behavior

The theory of planned behavior was developed by Icek Ajzen in 1985. This theory contends that the actions/ decisions of individuals or organizations are influenced by their behavioral beliefs, normative beliefs, and control beliefs (Sommer, 2011). Although the theory was developed for use in the healthcare field, it has become a powerful tool for assessing managerial decision-making processes. Behavioral beliefs refer to what the organization believes regarding the consequence of its action (Cameron, Ginsburg, & Mendez, 2011). Normative beliefs refer to the organizations beliefs regarding the expectation of others towards the organization. Control beliefs refer to the organization's beliefs regarding the presence of factors that may impede or facilitate a given decision.

Ajzen's theory of planned behavior (TPB) provides a useful framework for examining project managers' willingness and commitment to implement risk management practices (Reid & Ritchie, 2011). According to TPB, the project managers behavioral, normative, and control beliefs regarding risks and risk manage interact to shape their decisions and actions. The TPB theory proposes that in order to understand the risk management practice practiced at public secondary school in Kiambu County, there is a need to examine stakeholders' attitude, beliefs, and perceived constraints when it comes to the project risk management.

2.2. Empirical Review

All empirical studies must be connected to literature and previous work, as well as, demonstrate the need for the study. This is main goal of the empirical review exercise. According to Rocco and Plakhotnik (2009), empirical review helps researchers to build foundation for the study, conceptualize the study variables, demonstrate how the study advances knowledge, assess research designs and instruments, and obtain a reference point for interpreting findings. This section presents the review of empirical studies related to the research issue.

2.2.1. Influence Risk Identification Practices on Successful Implementation of Projects

Risk identification is the first step in the risk management process. This step entails determining risks that could have an impact, either positive or negative on the project's objectives (Project Management Institute, 2013). There are various techniques for identifying risks including use of checklist, decision driver analysis, SWOT analysis, and assumption analysis (Wet & Visser, 2013). The Project Management Institute (2013) recommended the use of a risk breakdown structure (RBS). An RBS is a diagrammatic tool that helps project teams to decompose the risks that their project is likely to encounter into various categories. These categories include technical risks, external risks, organizational risks, and project management risks.

Best practices in risk identification include encouraging all teams and team members to identify risks, considering organizational and environmental factors, involving stakeholders, development of a risk register, and revising the risk register regularly. In their study, Kipyegen, Mwangi, and Kimani (2012) found that for organizations to develop prudent risk identification culture they must create awareness, train staff, create policies and standards to govern risk identification process, and develop a mechanism for motivating staff to adhere to risk identification policies and standards.

In their study, Tadayon, Jaafar, and Nasri (2012) assessed the risk identification practices in late construction projects in Iran. The researchers noted that risk identification was an important step in risk management process as it enables project managers to identify suitable methods of managing risks. The researcher collected data from 43 respondents mainly workers for construction companies. Result showed that brain-storming was the most popular method of risk identification and that the experience of project managers was critical to the process of identifying risks. Otieno (2013) sought to examine role of risk management practices in core banking software projects success among 14 banks in Kenya. Results revealed that project success was an outcome of personal and individual evaluation of project characteristics by each stakeholder. He recommends than banks adopt an integrated risk management tool that will help them manage risk holistically.

In another study, Bakker, Boonstra, and Wortmann (2014) found the use of risk identification has a positive influence on objective and perceived project success. Results also revealed that communication between project team members during risk identification plays an important role in ensuring effective identification of risk. The study was experimental in nature and involved 53 project groups

comprising of business administration students from University of Groningen in Netherlands. Otniel, Nicolae, and Claudiu (2012) found that there were two main approaches in which projects handle risks: evaluation approach and the management approach. However, regardless of the chosen approach, a standard method for identifying, assessing, and responding to risk must be used in any project in order to increase chances of success.

2.2.2. Influence of Risk Analysis Practices on Successful Implementation of Projects

Risk analysis is the process of providing a deeper understanding of the potential risks that a given project faces (Kendrick, 2009). Risks are analyzed on the basis of two factors; probability of occurrence and their impact on projects. The goal of the risks analysis process is to rank and prioritize risks so as to determine which risks are significant enough to warrant treatment. The rationale for the risk identification process is that not all risks are worth the project team members' attention (Project Management Institute, 2013). In order to optimize the use of resources, project teams need to focus on risks that have a large probability of occurring and/ or have significant impact on the project

Risks analysis method can be divided into two broad categories: quantitative and qualitative risk analysis. Qualitative risk analysis methods include brain storming, descriptive analysis, direct judgment, root-cause analysis, fishbone diagram, failure mode and effect analysis (FMEA), historical data, use risk rating scales, and the Delphi technique (Heldman, 2011). Quantitative risk analysis techniques include parametric/ statistical estimation, simulation, sensitivity analysis, scenario analysis, and probability analysis (Wet & Visser, 2013). The risk analysis exercise should enable the project team to rank all the identified risk from the most to the least important risk. This exercise enables the project team to determine the risks to which they should pay significant attention.

In their study involving 415 projects in Brazil, Junior and Carvalho (2013) did a factorial analysis with the aim of identifying factors that are important for effective performance of the risk analysis exercise. Results revealed that the most important factors include techniques and tools used in the analysis, the processes used in the analysis, knowledge of the person conducting the risk analysis exercise, and the nature of the risk. Rubin (2014) found that a complete risk analysis exercise increased the success probability of projects by enabling project teams to focus on and allocate resources towards solving the most important risks. However, the researcher emphasized the need to use risk analysis tool carefully, cleverly, and efficiently to avoid getting misleading results.

In their meta-analysis of empirical evidence regarding impact of risk management on the success of IT projects, Bakker, Boonstra, and Wortmann (2010) found that many IT projects rarely do risk analysis especially quantitative risk analysis. The researchers observed that many IT project managers do not regard the risk analysis as a valuable exercise. They also noted that key stakeholder's perception of risk and their impact on project success has an impact on their project risk management practices. In survey involving 701 project managers from seven industries in three diverse countries (New Zealand, Japan, and Israel), Zwikael and Ahn (2010) found the context and industry in which projects are implemented has an impact on perceived level of project risk and intensity of risk analysis practices. This finding has a significant implication when it comes to generalization of evidence regarding risk analysis and risk management practices.

2.2.3. Influence of Risk Treatment Practices on Successful Implementation of Projects

Risk treatment, also known as risk response, is a step in the risk management process that entails selecting and implementing measures to modify the most significant risks that a given project is likely to encounter (Kendrick, 2009). Risk treatment strategies can be divided into four main categories: avoidance, transfer, mitigation, and acceptance. The risk treatment strategy adopted by a given organization or project is determined by risk appetite and risk tolerance (Project Management Institute, 2013). Risk appetite refers to the amount of uncertainty that the organization or project can accept while risk tolerance refers to the amount of impact that a given organization or project can impact.

In their study, Bhoola, Hiremath, and Mallik (2014) assessed risk treatment strategies that were practices in software development projects in India. The study involved 302 project managers from various IT firms. Results of the study revealed that mitigation strategy had the most significant impact on success of software development projects. Acceptance, avoidance, and transference strategies were only manifested in the form of transparency in communication to stakeholders, coordination between project stakeholders, and careful study of nature. Luppino, Hosseini, and Rameezdeen (2014) found that the effectiveness of risk treatment strategies is closely connected to the quality of the risk analysis process. The author investigated two case studies that had deployed the failure mode and effect analysis (FMEA) and found that the method facilitates identification of effective contingency plans for mitigating high-priority risks.

In his study, Li (2009) found that there is no 'one size suit all' strategy for treating risks. The effectiveness of a given strategy is determined by the nature and context of risk. His study focused on examining unique risks faced by overseas development projects and recommending suitable risk treatment strategies. Hillson (2012) noted risk treatment is the heart of risk management process as without treatment measures the risk identification and analysis exercises will be worthless. He also noted that despite the importance of the treatment step in the risk management process, this step is the least developed in many projects. Many projects do not have structured strategies for responding to risks and action plans for implementing these strategies.

2.2.4. Influence of Risk Control Practices on Successful Implementation of Projects

Project risks keep changing as the environment in which the project is being executed changes. As the project environment changes, some new risks may emerge and some existing risks may disappear (Helman, 2011). Consequently, risk management should not be one-time event, but a continuous and progressive process. Risk control practices help to turn risk management into continuous process. Risk control has two main components: risk monitoring and risk review. Risk monitoring entails continually assessing risks

that have been identified and risk treatment strategies that have implemented so as to ensure adherence to the risk management plan (Kendrick, 2009). On the other hand, risk review is the periodic assessment of the effectiveness of the risk, actions taken to treat risks, and the environment in which the project in being executed.

Risk control best practices include: conducting risk audits, variance and trend analysis, setting timelines for implementing risk treatment strategies, keeping records, providing feedback to stakeholders, and establishing formal procedures for tracking and reviewing risks (Heldman, 2013). The risk monitoring and review process should also be open to and inclusive of all stakeholders. In their study, Kishk and Ukaga (2008) found that projects that managed risk on a continual basis had better outcomes than projects that did not undertake risk management continuously. This finding highlighted the important of risk monitoring and review to the process of risk management.

In another study, Conforti, Fortino, and Michael (2013) sought to develop an approach that facilitates real-time monitoring of risks in business processes. They recommended and test a sensor-based approach where sensor defined to specific risk conditions were designed and installed in operation system to prompt managers when a particular risk is detected. Results of the test showed that architecture can be an effective method of monitoring risks. Although this approach may not be practical in projects and context, the study highlighted the potential that a real-time risk monitoring system could bring to the process of managing project risks. Bedard, Deis, Curtis, and Jenkins (2008) examined factors that determine the effectiveness of risk monitoring and control practices among Indian banks. Findings revealed that availability of formal monitoring and control procedures, independence of auditors, level of application of electronic decision aids, communications, and effectiveness in instituting corrective measures were some of the factors that influence the effectiveness of risk monitoring and control exercises. Although the study was not done in a project environment, some of these factors also apply to projects.

2.3. Conceptual Framework

A conceptual framework is a graphical presentation of the variables of interest in a given study and the relationship between these variables (Bryman & Bell, 2011). It plays an important role of guiding and organizing the study. As shown in Figure 1, the study had five variables. Project success was the dependent variable of the study. This variable was measured in terms of timely completion of projects, completion of projects within budget, extent to which project meet technical specification, extent to which project meet stakeholder's expectation, and extent to which projects support overall objectives of the schools.

Risk identification was one of the independent variables of the study. This variable was measured in terms of the extent to which principals and BOGs are knowledgeable and trained in risk identification, principal's attitude regarding importance of risk identifications, availability of formal risk identification policy and procedures, extent to which risks are documented, extent to which risk identification process involves key stakeholders, and availability of a risk register for completed or projects in progress. The second independent variable is risk analysis practices. This variable was measured in terms of knowledge/ training in risk analysis, principals' attitude towards importance of risk analysis, availability of formal policy and procedure for analyzing risks, extent to which key stakeholders are involved in project risk analysis, and extent to which risks are recorded. The third independent variable is risk treatment practices.

Risk treatment practices was measured in terms of whether principals and BOG have knowledge or training on risk treatment, whether the school has defined and documented strategies for treating different categories of risks, attitude of principals regarding importance of risk treatment, whether BOG has defined and understands the institutions' risk tolerance, extent to which the school dedicates resources toward treating project risks, and extent to which key stakeholders are involved in planning risk treatment strategies. The final independent variable was risk control. This variable was measured in terms of whether principals have training in risk control, attitude of principals regarding the important of risk control to project success, whether the school has formal policies and procedure on risk control, extent to which all stakeholders are involved in risk control activities, and extent to which the school keep and update the risk register of risk.

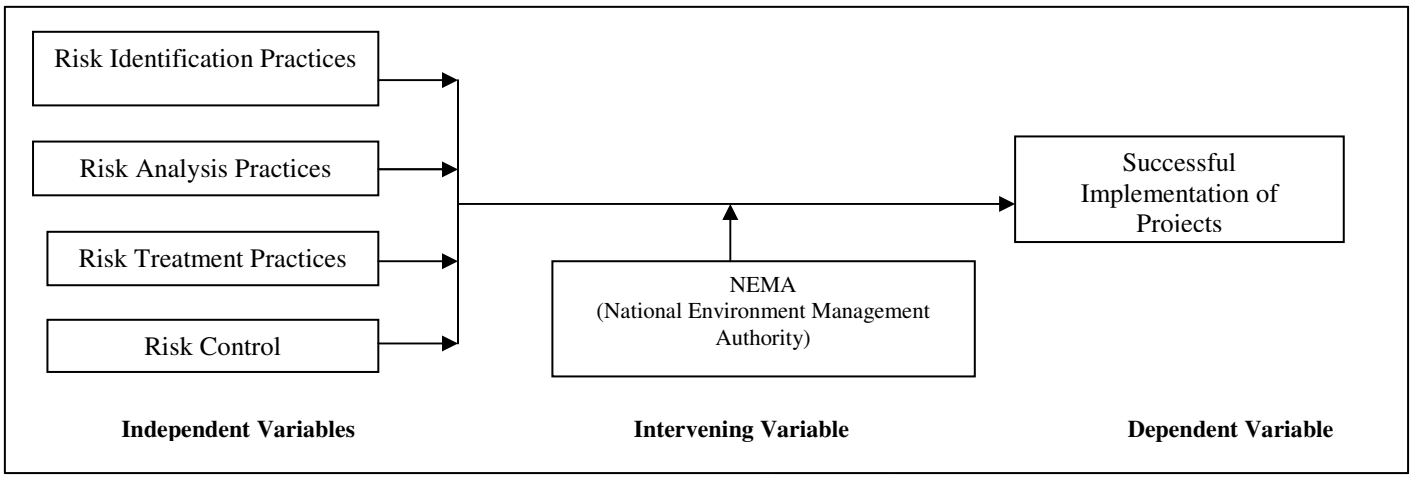

Figure 1: Conceptual Framework

2.4. Critique of Existing Literature

Risk identification is well covered subject in risk management literature. There are a number of studies that have explored risk identification practices including Tadayon, Jaafar, and Nasri (2012); Bakker, Boonstra, and Wortmann (2014); and Otniel, Nicolae, and Claudiu (2012). However, these studies have been conducted outside the country; hence, the applicability of their findings to the Kenyan context can be questioned. Kipyegen, Mwangi, and Kimani (2012) examined risk management practices in Kenya, but their study focused on risk management in organizations and not in project environments. Given that projects are often new undertakings; their risks are unique from those associated with routine operations. Otieno (2013) explored risk management in projects, but his study was limited to software development companies whose setting is significant from the environment in which public secondary schools operate.

There are also a good numbers of studies that have examined risk analysis practices including Junior and Carvalho (2013); Rubin (2014); Bakker, Boonstra, and Wortmann (2010); and Zwikael and Ahn (2010). However, all of these studies have been conducted in a context that is different from Kenya. No studies have examined risks analysis practices among Kenyan organizations and, specifically, risks analysis practices among projects implemented in the public school settings. There is a significant gap in knowledge where this variable is concerned.

The subject of risk identification has also been widely covered in literature. Bhoola, Hiremath, and Mallik (2014); Luppino, Hosseini, and Rameezdeen (2014); Li (2009), and Hillson (2012) are among the studies that have examined risk management practices across different organizations and projects located in different settings. In the Kenyan setting, Kinyua, Ogollah, and Mburu (2015) and Kipyegen, Mwangi, and Kimani (2012) are among the studies that have touched on the subject of risk identification in projects. However, the two studies have been conducted in ICT firms and not the public school environment. Given that different industry are exposed to different competitive and regulatory factors, the applicability of the findings of these studies to project management in Kenya secondary schools may be questioned.

Risk control is considered an essential risk management step in many studies that examine risk management in the corporate setting. However, this subject is relatively new when it comes to project management research. There is a shortage of studies that explore risk monitoring and review practices within the project setting. Given the importance of the risk monitoring and review exercise in ensuring that project risk management plans respond to changes in the project environment, there is need for a study that explores best practices in this area.

2.5. Research Gap

A research conducted by Wanjala, Khatete, Mbaka, and Asiago (2014) examined the preparedness of secondary school management in the planning, supervision, monitoring, and evaluation of school projects in Gucha District, Kenya. The researchers noted that infrastructural development in schools was vital to the realization of the Kenya's Vision 2030 education goals. They also noted that as heads of schools, principals were expected to act as project managers and oversee the process of planning, supervising, and monitoring school's projects. Consequently, these principals required specialized skills in order to execute these functions.

The researchers employed a descriptive survey design where they collected data from 42 principals and 42 chair persons of B.O.G. Findings revealed that school principals lacked competency in planning, supervising, and monitoring school construction projects. Findings also showed that and chair persons of B.O.G. lacked the skills to assist principals in the planning and implementation of school projects. The study acknowledges the deficiency of skills and competency in the management of projects in Kenyan public secondary school. However, the study by Wanjala, Khatete, Mbaka, and Asiago (2014) was significantly different from the current study because the researchers did examine the specific project management skills and knowledge areas that were lacking among the school's principals and B.O.G. chair persons.

There is gap in knowledge regarding the precise skills and knowledge areas that were lacking in the studied schools. Understanding exactly what skills need to be improved in order to enhance project management in public secondary schools will help policy makers to develop precise training programs for addressing these skills. The current study sought to address this knowledge gap by examining project risk management practices among public secondary schools and how the effectiveness of these practices affect the successful implementation of school projects. The study focused on how risk identification, risk analysis, risk treatment, and risk control practices affect project outcomes within the schools.

3. Methodology

3.1. Research Design

Research design refers to the blueprint used for fulfilling specific research objectives and questions. Descriptive studies describe characteristics of a population or phenomenon focusing on providing answers to questions of who, what, when, where and sometimes how about a phenomenon of interest (Copper & Schindler, 2003). It is also described by Kothari (2004) as the arrangement of conditions for collection and analysis of data that brings together the relationships and rationale of a study in order to empirically and economically achieve research objectives.

This study employed a descriptive research design. The descriptive design is appropriate for the study since the study focused on describing the current status of the use of best practices in project risk management in enhancing the success of projects undertaken in a sample of public secondary schools in the County Government of Kiambu. The findings will then be generalized to describe the risk

management practices of public secondary schools and to inform policies on how the risk management process can be improved in order to improve project outcomes.

3.2. Target Population

According to Mugenda & Mugenda (2003) a population refers to the entire group of individuals, events, or objects having a common observable characteristic. A population consists of all elements of study in a research. The County Education office indicates that there were 246 public secondary schools in the County of Kiambu as at 30th June 2015. The 246 schools made up the target population for this study.

3.3. Sampling Frame

A sampling frame is a list or devise that contains complete information about the population of study and from which the sample is obtained (Mugenda & Mugenda, 2003). The sampling frame for the current study was the list of public secondary schools (see Appendix II).

3.4. Sample Size and Sampling Technique

This study applied stratified random sampling method to select a sample to be used in the research. Stratified random sampling is a probabilistic sampling technique that entails dividing the population into groups known as strata according to certain attributes, and then selecting participants from each stratum randomly (Cooper & Schindler, 2003). The strata were the classification of public secondary schools in the County Government of Kiambu as National Schools, County Schools or District Schools. Stratified random sampling ensured that the sample is representative of the variations in the public secondary school according to their classification.
According to Mugenda and Mugenda (2003), a sample size that is more than 20% of the population makes a representative sample. This research used 30% of the 246 public schools sampled as shown in Table 1 below. The total sample composed of 74 schools. This was a 30% representation level which according to Mugenda and Mugenda (2003) is statistically representative for a population with closely related characteristics. Either the principal or the deputy principal in a sampled school was given an opportunity to participant in the study.

School Category	Number of Schools	30 Percent	Proportion of Sample
National	7	2	2.7%
County	36	11	14.9%
District	203	61	82.4%
Total	**246**	**74**	**100%**

Table 1: Target Population and Sample Size
(Source: Kiambu County Education office, 2016)

3.5. Data Collection Instrument

Primary data was collected through structured questionnaires (see Appendix I). According to Mugenda and Mugenda (2003) questionnaires are commonly used to obtain important information about the population. Each item in the questionnaire was developed to address a specific objective, research question or hypothesis of the study as posited by Mugenda & Mugenda (2003). The tool was structured into two sections which include: personal information section to capture the demographical information from the study sample; and objectified questions to meet the study mandate.

3.6. Data Collection Procedure

The questionnaires were administered to the respective respondents and picked later to allow the respondents ample time to internalize and fill them. The drop and pick method of administering questionnaire was selected because it increases response rate by giving a personal touch to the data collection process (Bryman & Bell, 2011). This strategy was also economical and time saving.

3.7. Pilot Test

A pilot study is a smaller version of a larger study that is conducted to prepare for that study. A pilot study can involve pre-testing a research tool, like a new data collection method. It can also be used to test an idea or hypothesis (Hulley, 2000). The aim of the pilot test is to check the reliability and validity of the study.

3.7.1. Reliability

Reliability refers to the extent to which the study gives findings that are consistent (Cooper & Schindler, 2003). The pilot study involved 7 public secondary schools in Kiambu County in line with Bryman and Bell (2011), who recommended that the sample size of a pilot study be at least 10% of the sample size for the main study. Data from the 7 schools was excluded in the main study. Data collected during the pilot study was analysed using the Cronbach Alpha test at the 0.7 threshold. As shown in Table 2, questions under the five variables had Cronbach Alphas of more the 0.7, hence, the questionnaire is consistent.

Variable	N of Items	Cronbach's Alpha
Risk Identification Practices	7	0.743
Risk Analysis Practices	7	0.805
Risk Treatment Practices	7	0.840
Risk Control Practices	6	0.788
Successful Project Implementation	6	0.883

Table 2: Cronbach Alpha Test Results

3.7.2. Validity

Validity is the extent to which findings of the study reflect reality (Cooper & Schindler, 2003). Validity is also affected by the consistency of the data collection instrument, but it is also influenced by other factors such as the size of the sample, the sampling technique, and the objectivity of the researchers during data collection and analysis. These factors were also taken into consideration with the aim of enhancing validity.

3.8. Data Analysis

Data was analyzed using both descriptive and inferential statistical techniques. Descriptive statistics quantitatively describes the main features of a collection of information or the quantitative description the sample itself (Mann, 1995). Descriptive analysis was done using percentages and frequencies. Inferential statistics is used to draw inferences about the relationship between study variables. The researcher relied on the Pearson Correlation and regression techniques to do the inferential analysis. The regression model was as follows:

$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$,

Where Y = successful implementation of projects; α = constant (coefficient of intercept); β_1, β_2, β_3 and β_4 = Beta coefficients; X_1=risk identification practices; X_2= risk analysis practices; X_3= risk treatment practices, X_4= risk control practices, and ε = Error term

4. Research Findings and Discussion

4.1. Response Rate

Response rate is the proportion of people who completed the data collection exercise expressed as a percentage of the number of people in the sample (Cooper & Schindlet, 2013). Out of the 74 questionnaires that were distributed to potential respondents, 58 were duly filled and returned to the researcher. This figure represents a response rate of 78.4%. According to Mugenda and Mugenda (2003), a response rate of more than 50% is adequate for facilitating statistical analysis

School Category	Expected	Actual	Response Rate
National	2	2	100%
County	11	9	81.8%
District	61	47	77.1%
Total	**74**	**58**	**78.4%**

Table 3: Response Rate

4.2. Demographic Characteristic of the Sample

The researcher analyzed various demographic characteristics of the sample include gender, age bracket, length of stay at current organization, and highest education level. According to Siffer, Puddy, Warren, and Roberts (2002), analyzing the demographic characteristics of the sample enables the researcher to determine the generalizability of research findings.

4.2.1. Gender of Participants

As shown in Table 4, 70.7% of the respondents were male while 29.3% were female. The gender distribution of the sample matches the general trend in the public secondary school's management workforce. A report by the Southern and Eastern African Consortium for Monitoring Education Quality (2010) revealed that less than 15% of secondary schools in Kenya are managed by female principals.

Gender	Frequency	Percentage
Male	41	70.7
Female	17	29.3
Total	**58**	**100**

Table 4: Gender Distribution of Sample

4.2.2. Participants Age Bracket

As shown in Table 5, a majority of the participants (41.4%) were within the 40-49 years' age bracket, 29.3% were within the 30-39 years' age bracket, 24.1% were above 50 years, and only 5.2% were below 30 years. The age distribution of the sample is also in line

with the general trend in the population of school heads in public secondary schools in Kenya. In his study targeting head teachers in Mathera Constituency, Wamuyu (2010) also found that a majority of participants were between the 41- 50 years' age bracket. Bosire, Sang, Kiumi, and Mungai (2009), also found that a majority of head teachers in Laikipia and Nyandurua Counties were between 40 and 50 years.

Age Bracket	Frequency	Percentage
20- 29 years	3	5.2
30-39 years	17	29.3
40-49 years	24	41.4
Above 50 years	14	24.1
Total	**58**	**100**

Table 5: Age Distribution of Study Sample

4.2.3. Length of Stay at Current Organization

The researcher also assessed the duration in which participants have served as heads at their current institutions. As Table 6 shows, a majority of the respondents had served as heads of the institutions for 4-6 years, 27.6% had served for 1-3 years, and only 6.9% had served for less than 1 year. The data show that majority of the participants were in a position to provide accurate information regarding the risk management practices and project implementation in their current schools.

Age Bracket	Frequency	Percentage
< 1 year	4	6.9
1-3 years	16	27.6
4-6 years	19	32.8
7-9 years	10	17.2
10 years and above	9	15.5
Total	**58**	**100**

Table 6: Participants Length of Stay at the Organization

4.2.4. Highest Education Level

A majority of the respondents (60.3%) had attained Bachelor Degree level of education, 20.7% had a minimum of Master's level education, and only 19% had the Diploma/ college level education. This distribution is also in line with the general trend within the population of head teachers of secondary schools in Kenya. Ruttoh (2014) also found that 77.0% of head teachers Kuresoi sub-County had the Bachelor's degree level of education. Nzenya (2013) also found that 93.3% of head teachers in Nzaui District in Makueni County had the Bachelor's degree level of education.

Age Bracket	Frequency	Percentage
Diploma/ College Level	11	19.0
Bachelor Degree Level	35	60.3
Master's Degree & Above	12	20.7
Total	**58**	**100**

Table 7: Highest Level of Education attained by Respondent

4.3. Descriptive Analysis

The focus of descriptive analysis is to assess respondents' views regarding the study variables without testing the relationship between variables. The analysis focused on examining participants view regarding risk identification, risks analysis, risk treatment, and risk control practices at public secondary schools.

4.3.1. Project Risk Identification Practices in Public Secondary Schools

The researcher asked participants to respond to series of statement aimed at assessing the risk identification practices in public secondary schools in Kiambu on five-point rating scale. The first sought respondent's view on whether there exist risk areas in projects implemented in public secondary schools in Kiambu. As shown in Table 8, a mean of 4.05 suggest that a majority of the respondents agreed that risk areas existed in projects implemented by their schools. This finding is consistent with Wamuyu (2012), who found that head teachers of public secondary schools in Mathera constituency encountered numerous risks during implementation of school projects. Some of these risks included shortage of funds, stakeholder management risks, and physical risks such as theft of project materials and accidents.

	N	Min.	Max.	Mean	Std. Dev.
There exist risk areas in the projects implemented in public secondary schools in Kiambu	58	1	5	4.05	.981
The school's management has the knowledge and skills to identify these risk areas	58	1	5	3.94	.903
Risk identification is important to the success of the school project	58	1	5	4.31	.846
The school has written policy and procedure on how to risk identification should be conducted	58	1	5	4.52	1.017
The school open risk register for each project where potential risks are documented	58	1	5	3.62	1.077
The management involves key stake holders in the process of identifying risks	58	1	5	3.98	.943
NEMA has provision that require schools to identify risks that their projects are likely to encounter	58	1	5	3.59	.958
Valid N (listwise)	58				

Table 8: Descriptive Analysis of Risk Identification Practices

Participants were also asked whether the school management was able to identify the various risks areas encountered during the implementation of projects. A mean of 3.94 indicates that a majority of the participants gave positive responses suggesting that school management had the ability to identify risk areas (see Table 8). A majority of respondents (Mean 4.31) also expressed the view that risk identification was an important determinant of successful implementation of projects in schools. This finding is consistent with Odhiambo and Ngugi (2014), who found that risk identification allows project team to anticipate and analyze risks, increases risk transparency, and leads to more precise risk response measures.

When asked whether their school had written policy and procedures on how risks identification should be done, a majority of participants (Mean 4.52) gave a positive response. However, only 44.8% of the respondents reported that the school's management creates a risk register for each project where potential risks are documented. The finding is congruent with the study by Kinyua, Ogollah, and Mburu (2015), where it was found that project risk management was not highly formalized among 48 ICT projects in Nairobi. A majority of the participants (mean 3.98) said that their school's management involves key stakeholders in the process of identifying risks, which according to Olson and Wu (2010) is a positive thing. In addition, a majority of respondent (mean 3.59) reported that NEMA had provisions that require schools to identify potential project risks, which suggests that regulations play some role in influencing risk identification practices.

4.3.2 Project Risk Analysis Practices in Public Secondary Schools

Research participants were also asked to respond to a set of statements aimed at assessing risk analysis practices in their schools on a five-point rating scale. The first statement sought respondents' views on whether the management of their schools had knowledge of both quantitative and qualitative risks analysis methods. As shown in Table 9, a majority of the respondents (mean 3.52) agreed with the statement that the management of the school had knowledge of the risks analysis methods. The finding is consistent with Kinyua, Ogollah, and Mburu (2015), who found that a majority of ICT project managers (63%) in 43 companies in Nairobi had knowledge of risks analysis methods.

As indicated by the mean of 3.82, a majority of research participants also reported that their schools had formal policy and procedures on how risk analysis should be done. The finding is not consistent with Kipyegen, Mwangi, and Kimani (2012), who found that 87% of IT project managers and developers do not use formal risk management techniques. The inconsistency may be explained by industry differences, as well as, the lapse in time between their study and the current study. As Table 9 shows, a majority of respondents (mean 4.33) expressed the view that risk analysis was an important determinant of successful implementation of school projects. The finding is congruent with Rubin (2014), who found that a complete risk analysis exercise increased the success probability of projects by enabling project teams to focus on and allocate resources towards solving the most important risks.

A majority of respondents (mean 3.74) said that NEMA had provision that requires schools to analyze project risks, which suggest that regulations play some role in influence risks analysis practices. The majority of participants (mean 3.53) also reported that their school's management involves key stakeholders in the process of analyzing risks. The finding is in line with Junior and Carvalho (2013), who found that, involvement of key stakeholders was important for effective performance of the risk analysis exercise. As Table 9 shows, many respondents (mean 3.85) reported that after risk analysis is done; all risks are ranked according to their level of importance to the project, which according to Rubin (2014) is the main goal of the risk analysis exercise.

	N	Min	Max.	Mean	Std. Dev
The school management has knowledge of quantitative and qualitative methods of risk analysis	58	1	5	3.52	.958
The school has formal policy and procedures on how risk analysis should be done	58	1	5	3.82	.985
Risk analysis is important to the success of the school projects	58	1	5	4.33	.962
NEMA has provisions that require schools to analyze risks that they are likely to encounter during project implementation	58	1	5	3.74	.917
The BOG involves key stakeholders in the process of analyzing risks	58	1	5	3.53	1.047
For each project, risks that are identified and analyzed are documented in the risk register	58	1	5	3.52	1.117
After risk the analysis exercise, all identified risks are ranked in order of their importance to the project	58	1	5	3.85	.902
Valid N (listwise)	58				

Table 9: Descriptive Analysis of Risk Analysis Practices

4.3.3. Project Risk Treatment Practices in Public Secondary Schools

The researcher asked respondent to respond to series of statement in order to assess risk treatment practices at public secondary schools. The first statement sought respondent's views on whether their school's management had knowledge of the various risk treatment strategies. As shown in Table 10, a majority of the respondents (mean 3.69) gave a positive response suggesting that the management in their schools had knowledge of risk treatment strategies. A majority of the respondents (mean=3.53) reported that their schools had defined and documented strategies for treating different categories of risks. These findings contradict Kipyegen, Mwangi and Kimani (2012), who found that 87% of software development projects in Nairobi used ad hoc approaches of managing risks. It was also found that 81% of these software project managers lacked awareness of the existence of structured risk response approaches. However, their study was conducted in an industry that is significantly different from the education industry and 4 years have elapsed since the study was published.

When asked whether risk treatment exercise is important to the success of school projects, a majority of the respondents (mean 4.17) gave positive responses. This is in line with study by Kinyua, Ogollah, and Mburu (2015), where 90% of the respondents reported that risk treatment enhanced the performance of ICT projects. Similarly, 93% of participants in the study by Kipyegen, Mwangi and Kimani (2012) totally agreed that the use of systematic risk response was important to project success. As Table 10 shows, a majority of the respondents (mean=3.67) said that NEMA had provision that required schools to develop risk treatment strategies for all projects. This finding suggests that regulations play some role in influencing risk treatment practices of public secondary schools.

Research participants were asked whether the management understands and has defined the school's level of risk tolerance. A majority (mean=3.52) said that their school's management understood and had defined their schools risk tolerance. According to Kwak and LaPlace (2005), defining project risk tolerance level enables the project team to prioritize risks more effectively and focus on treating the most important risks. A majority of the respondents (mean=3.71) also reported that the school's management allocates adequate resources toward project risk treatment and that the school's management involved key stakeholders in the planning and implementation of risk treatment strategies.

	N	Min.	Max.	Mean	Std. Dev.
The school's management has knowledge of the various risk treatment strategies	58	1	5	3.69	.946
The school has defined and documented strategies for treating different categories of risks	58	1	5	3.53	1.112
The risk treatment exercise is important to the success of school projects	58	1	5	4.17	.910
NEMA has provisions that require schools to develop risks treatment strategies for all projects	58	1	5	3.67	1.030
The management team understands and has defined the school's level of risks tolerance	58	1	5	3.52	.958
The school's management allocates resources towards treating project risks	58	1	5	3.71	1.043
The BOG involves key stakeholders in the planning of risk treatment strategies for projects	58	1	5	3.64	1.095
Valid N (listwise)	58				

Table 10: Descriptive Analysis of Risk Treatment Practices

4.3.4. Project Risk Control Practices in Public Secondary Schools

Participants were also asked to respond to a set of statement aimed at assessing project risk control practices within their institution. The first statement sought respondents view on whether the school's management had knowledge of the various techniques for controlling risks. As indicated by a mean of 3.64 in Table 11, a majority of the respondents gave positive responses. A similar proportion of the participants (mean 3.59) also reported that their schools had written policy and procedures on how risk control should be done. These findings contradict Wachuru (2013), who found that many CDF project managers in Juja Constituency were ignorant of best practices in risk control and that the application of risk management practices was minimal. Kipyegen, Mwangi, and Kimani (2012) also found that most software development projects in Kenya did not use structured approaches of managing risks. Again, the consistency may be explained by industry and time differences between these past studies and the current study.

A majority of the participants (mean=4.34) were in agreement that effective risk control practices play an important role in the successful implementation of school projects. This is line with Odhiambo and Ngugi (2014), who found that risk monitoring and review enabled managers to take an aggregated view of risks, identify and respond to new risks, and improve the general responsiveness of the project. Wachuru (2013) also found that there was a relationship between level of application of risk control practices and the successful implementation of CDF projects in Juja Constituency. When asked whether NEMA had a provision that require schools to monitor and review project risks, many of the participants (mean=3.84) gave positive responses suggesting that regulation also play some role in influencing risk control practices in school projects.

As shown in Table 11, a majority the respondents (mean=3.60) were in agreement that their school's management involves key stakeholders in the process of controlling risks. According Bedard, Deis, Curtis, and Jenkins (2008), involvement of stakeholders is one of the determinants of the effectiveness of the risk control process. Olson and Wu (2010) also found that involvement of key stakeholders make the risk management process more comprehensive. A majority of the respondents (mean=3.57) also reported that their school's management keeps and updates the risk register on a regular basis. This finding is not in line with Kanyua and Muturi (2013), who found that only 10% contractors in construction projects in the Kenya petroleum industry have a systematic process of monitoring and controlling risks.

	N	Min.	Max.	Mean	Std. Dev
The school's management has knowledge of various techniques for monitoring and reviewing risks	58	1	5	3.64	1.180
The school has written policy and procedures on how risk control should be done	58	1	5	3.59	1.103
Risk control plays an important role in the success of school projects	58	1	5	4.34	.965
NEMA has provisions that require schools to monitor and review projects risks	58	1	5	3.84	1.040
The school's management involves key stake holders in the process monitoring and reviewing risks	58	1	5	3.60	1.091
For each project, the management keeps and updates the risk register on a regular basis	58	1	5	3.57	1.186
Valid N (listwise)	58				

Table 11: Descriptive Analysis of Risk Control Practices

4.3.5. Successful Implementation of Projects in Public Secondary Schools in Kiambu

Participants were also asked to respond to a set of statements that were aimed at assessing the level of success in the implementation of projects within their school. The first statement sought respondents' views on whether most of the projects completed by their schools within the past five years were completed with the scheduled time. The mean of 3.94 shown in Table 12 indicates that a majority of the participants reported that over 50% of the projects that were implemented in their schools were completed within schedule.

A majority of the participants (mean=3.54) also reported that over 50% of the projects that their schools implemented in the past five years were completed within budget. Similarly, a majority of the respondents (mean=3.71) said that over 50% of projects that their schools implemented in past five years met their technical specifications. According to Wachuru (2013), project implementation is considered to be successful when the projects are able meet three requirements: completed on time, completed within budget, and meet the required functionality. The views expressed by participants suggest that most of the projects undertaken by the schools in Kiambu were implemented successfully.

However, Prabhakar (2008) explained that the three criteria of cost, time and quality do not give a comprehensive view of project success. He suggested that project success be measured against the attainment of the overall objectives of the project. When asked whether the projects implemented by their schools in the past five years had contributed to improved academic performance, a majority of the participants (mean=3.97) gave positive responses. Similarly, a majority of the respondents (mean=4.17) reported that the projects that their school implemented within the past five years had improved learning. The overall objective of education institutions is to impart knowledge to students. In line with Prabhakar (2008) recommendations, projects that support this goal can be considered to be successful.

	N	Min.	Max.	Mean	Std. Dev
Over 50% of projects that the school has undertaken in the past 5 years were completed within the scheduled time	58	1	5	3.94	1.178
Over 50% of the projects that the school has undertaken in the past 5 years were completed within budget	58	1	5	3.54	1.222
Over 50% of the projects that the school has undertaken in the past 5 years met the technical specifications	58	1	5	3.71	1.026
Over 50% of the projects that the school has undertaken in the past 5 years met the expectations of stake holders	58	1	5	3.55	1.157
Over 50% of project that the school has undertaken in the past 5 years has contributed to improved academic performance	58	1	5	3.97	.955
The projects that the school has undertaken in the past 5 years have enhanced learning	58	1	5	4.17	.901
Valid N (listwise)	58				

Table 12: Descriptive Analysis of Implementation of School Projects

4.4. Inferential Analysis

Inferential analysis focused on testing relationship between study variables. The researcher used the Pearson correlation technique to examine the relationship between risk identification, risk analysis, risk treatment, risk control, and successful implementation of school projects.

4.4.1. Influence of Risk Identification Practices on Successful Implementation of Projects

The first objective of the study was to examine the influence of risk identification practices on the successful implementation of projects in public secondary schools in Kiambu. As shown in Table 13, the Pearson Correlation test gave a p-value of 0.017 for risk identification, which suggests the existence of a significant relationship between risk identification and the independent variable at the 0.05 level of significance. We, therefore, reject the null hypothesis which stated that there is no significant relationship between risk identification practices and the success implementation of projects in public secondary schools in Kiambu.

This finding is consistent with Otieno (2013), who found that effective risk identification practices resulted in improved outcomes for software development projects implemented in a sample of 14 Kenya Banks. Tadayon, Jaafar, and Nasri (2012) found that risk identification was an important step in risk management process as it enabled construction project managers in Iran to identify suitable methods of managing risks. The finding is also congruent Bakker, Boonstra, and Wortmann (2014), who found that use of effective risk identification practices had a positive influence on objective and perceived project success. Odhiambo and Ngugi (2014) also found that there exists a link between risk identification and the success of ICT projects.

The Person correlation coefficient for the relationship between risk identification practices and successful implementation of project is 0.313 (see Table 13). According to Mukaka (2012), a Person correlation coefficient that falls between +0.3 and +0.7 suggests that there is a positive relationship of moderate strength between the two variables. This implies that improving risk identification practices will increase the probability for successful implementation of school projects.

		Risk Identification Practices	Successful Implementation of Projects
Successful Implementation of Projects	Pearson Correlation	.313*	1
	Sig. (2-tailed)	.017	
	N	58	58
*. Correlation is significant at the 0.05 level (2-tailed).			

Table 13: Correlation between Risk Identification and Project Implementation

4.4.2. Influence of Risk Analysis Practices on Successful Implementation of Projects

The second objective of the study was to determine the influence of risk analysis practices on the successful implementation of projects in public secondary schools in the County Government of Kiambu. Table 14 shows that the Pearson correlation test gave a p-value of 0.000. Since the value is less than 0.01, it implies that there is a significant relationship between risk identification practices variable and the dependent variable at the 0.01 level of significance (Mukaka, 2012). We, therefore, reject the null hypothesis which stated that there is no significant relationship between risk analysis practices and successful implementation of projects in public secondary schools in Kiambu County.

The finding is in agreement with the study by Kinyua, Ogollah, and Mburu (2015), where it was found that the ability to assess the probability and potential impact of risk improves the fulfillment of projects' budgets, quality, schedule, and economic objectives. Rubin (2014) also found that a complete risk analysis exercise increased the success probability of projects by enabling project teams to focus on and allocate resources towards solving the most important risks. Odhiambo and Ngugi (2014) also found that developing proper mechanism for analyzing risks increased the effectiveness of project teams in terms of preventing and reaction to risks.

As shown in Table 14, the Pearson correlation coefficient for risk analysis 0.512, which according to Makaka (2012) indicate the existence of a positive relationship of moderate strength. This implies that improving risk analysis practices will increase the probability for successful implementation of school projects.

		Risk Analysis Practices	Successful Implementation of Projects
Successful Implementation of Projects	Pearson Correlation	.512**	1
	Sig. (2-tailed)	.000	
	N	58	58
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 14: Correlation between Risk Analysis Practices and Project Implementation

4.4.3. Influence of Risk Treatment Practices on Successful Implementation of Projects

The third objective of the study was to determine the influence of risk treatment practices on the successful implementation of projects in public secondary schools in Kiambu. The Pearson Correlation test gave a p-value of 0.00 (see Table 15), which indicate the existence of a statistically significant relationship between risk analysis practices and the dependent variable at the 0.01 level of significance. We, therefore, reject the null hypothesis which stated that there is no significant relationship between risk treatment practices and the successful implementation of projects in public secondary schools in Kiambu.

The finding is in line with Hillson (2012), who noted that risk treatment is the heart of risk management process as without treatment measures the risk identification and analysis exercises will be worthless. Kinyua, Ogollah, and Mburu (2015) also found that effective risk response measures reduced the probability that risks will materialize and increased the ability of the project team to react together when the risk occur. Odhiambo and Ngugi (2014) found that effective risk treatment measure resulted in improved project outcomes as it reduced the probability of the occurrence of negative risks and minimized the impact of risks when they occur.

The Person Correlation coefficient for the relationship between risk treatment and successful implementation of projects was 0.582 (see Table 15), which also indicates the existence of a positive relationship of moderate strength. This implies that improvement in risk treatment practices will increase the probability for successful implementation of projects.

		Risk Treatment Practices	Successful Implementation of Projects
Successful Implementation of Projects	Pearson Correlation	.582**	1
	Sig. (2-tailed)	.000	
	N	58	58
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 15: Correlation between Risk Treatment and Project Implementation

4.4.4. Influence of Risk Control Practices on Successful Implementation of Projects

The last objective of the study was to determine the influence of risk control practices on successful implementation of projects in public secondary schools in Kiambu County. As shown in Table 16, the Pearson Correlation test gave a p-value of 0.000, which according to Makaka (2012) implies the existence of a significant relationship between risk control and the dependent variable. This finding also led to the rejection of the null hypothesis, which stated that there is no significant relationship between risk control practices and successful implementation of projects in public secondary schools in Kiambu.

The finding is congruent with Odhiambo and Ngugi (2014), who found that risk control enhanced the outcome of ICT projects by enabling projects teams to identify and respond to newly occurring risks. Wachuru (2013) also found that the level of application of risk control practices was positives correlated with the successful implementation of CDF projects. Kishk and Ukaga (2008) also found that projects that managed risk on a continual basis had better outcomes than projects that did not undertake risk management continuously.

The Pearson correlation coefficient for the relationship between risk control practices and successful implementation of projects was 0.488 (see Table 16). The positive value suggests that improving risk control practices would increase the probability for successful implementation of projects. The value falls between 0.3 and 0.7, which according to Makaka (2012) signifies that the relationship is of moderate strength.

		Risk Control Practices	Successful Implementation of Projects
Successful Implementation of Projects	Pearson Correlation	.488**	1
	Sig. (2-tailed)	.000	
	N	58	58
**. Correlation is significant at the 0.01 level (2-tailed).			

Table 16: Correlation between Risk Control and Project Implementation

4.4.5. Regression Analysis

Multiple regression analysis was conducted in order to assess the overall influence of the four risk management variables on successful implementation of schools projects in Kiambu. The regression was $Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$, where Y = successful implementation of projects; α = constant (coefficient of intercept); β1, β2, and β3 = Beta coefficients; X_1=risk identification practices; X_2= risk analysis practices; X_3= risk treatment practices, X_4= risk control practices, and ε = Error term. As shown in Table 17, the r-square for the model is 0.496, which indicates that the independent variables explain 49.6% of the changes in the project implementation success.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.704[a]	.496	.443	.637
a. Predictors: (Constant), Risk Control, Risk Identification, Risk Analysis, Risk Treatment				

Table 17: Model Summary

Table 18 presents that Analysis of Variance for the regression model. The goal of the ANOVA is to test whether the predictors within the model have a statistically significant relationship with the dependent variable (Alvarez, Amsler, Orea, & Schmidt, 2002). The p-value for the F-test was 0.01, which suggests that the predictors have a statistically significant relationship with successful implementation of school projects at the 0.05 level of significance.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.620	4	3.905	5.570	.001[b]
	Residual	37.156	53	.701		
	Total	52.776	57			
a. Dependent Variable: Successful Implementation b. Predictors: (Constant), Risk Control, Risk Identification, Risk Analysis, Risk Treatment						

Table 18: ANOVA[a] for the Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant	2.787	.345		5.116	.000
	Risk Identification	.512	.097	.519	3.169	.001
	Risk Analysis	.544	.109	.549	3.445	.000
	Risk Treatment	.551	.114	.559	3.518	.000
	Risk Control	.535	.105	.541	3.256	.001
a. Dependent Variable: Successful Implementation of School Projects						

Table 19: Regression Coefficients

Table 19 presents the coefficients for the regression model. The p-values for the t-statistics show that, individually, each of the independent variables (risk identification, risk analysis, risk treatment, and risk control) had a statistically significant relationship with successful implementation of school projects. These results affirm the findings of the Person's correlation test and suggest that we reject the null hypotheses of the study. The Beta coefficients also show that risk treatment has the strongest relationship with successful implementation of school projects followed by risk analysis. Based on the Beta coefficients, the solved regression equation would be:

$Y = 2.787 + 0.519X_1 + 0.549X_2 + 0.559X_3 + 0.541X_4 + \varepsilon$

5. Summary of Findings, Conclusion, and Recommendations

5.1. Summary of Findings

The objective of this study was to examine the influence of risk identification, risk analysis, risk treatment, and risk control practices on the successful implementation of school projects. In order to realize the four objectives, the study employed an explanatory design where cross-sectional data was collected from a sample of 58 schools in Kiambu using structured questionnaires, and analyzed using descriptive and regression technique.

5.1.1. Influence of Risk Identification Practices on Successful Implementation of Projects

The first objective of the study was to examine the influence of risk identification practices on successful implementation of school projects in Kiambu. Results of descriptive analysis gave a general indication that the management of public secondary schools in Kiambu were applying best practices in identifying risks when planning for and implementing projects. Most respondents reported that their school's management had knowledge in skill identification, written policy and procedures on how risk identification should be conducted, involve key stakeholders in process of identifying risk, and create risk register for every project. Results of the

inferential analysis showed that there was a significant relationship between risk identification practices and the probability for successful implementation of school projects. The Pearson correlation test showed that an improvement in risk identification practices would increase the probability for successful implementation of projects.

5.1.2. Influence of Risk Analysis Practices on Successful Implementation of Projects

The second objective of the study was to determine the influence of risk analysis practices on successful implementation of projects in public secondary schools in Kiambu. Results of the descriptive analysis also gave an indication that the management teams of schools in Kiambu were applying best practices in analyzing project risks. A majority of the respondents reported that their management teams had knowledge of quantitative and qualitative risk analysis methods, had formal policy and procedure for guiding the risk analysis process, involved key stakeholders in risk analysis, and ranked risks according to their importance to the school projects. Findings also showed that regulations have some influence on project risk identification practices of public secondary school. In line with expectations, the inferential analysis demonstrated that there was a significant relationship between risk analysis practices and successful implementation of projects. The Pearson correlation test revealed that the application of effective risk analysis practices had a positive influence on project implementation.

5.1.3. Influence of Risk Treatment Practices on Successful Implementation of Projects

The third objective of the study was to determine the influence of risk analysis practices on successful implementation of projects in public secondary schools in Kiambu. The descriptive analysis showed that, generally, school management teams in Kiambu were also applying best practices when it comes to responding to project risks. It was found that a majority of the schools' management team had knowledge of the various risk treatment strategies, had defined and documented strategies for treating different categories of risks, understood and had defined the risk tolerance level for their projects, allocated resources for risk treatment, and involved key stakeholders in planning and implementing risk treatment strategies. It was also found that regulation had some impact on the project risk analysis practices in the schools. Inferential analysis revealed that there was a significant and positive relationship between risk treatment practices and successful implementation of school projects.

5.1.4. Influence of Risk Control Practices on Successful Implementation of School Projects

The fourth of the study was to determine the influence of risk control practices on successful implementation of projects in public secondary schools in Kiambu. Descriptive analysis showed that the secondary schools were also applying best practices when it comes to controlling project risks. Findings revealed that a majority of school management teams had knowledge of risk monitoring reviewing techniques, had written policy and procedures on how risk control should be done, involved key stakeholders in the risk control process, and reviewed the risk register for each project on a regular basis. Regulations also played some role in influence the schools risk control practices. In line with expectations, the inferential test showed that there was a significant and positive relationship between risk control practices and successful implementation of school projects.

5.2. Conclusion

The findings have led to the conclusion that risk management practices have a significant influence on the successful implementation of school projects. Available data has shown that all the four risk management variables (risk identification, analysis, treatment, and control practices) have a significant and positive influence of the successful implementation of projects in public secondary schools. Risk treatment was found to have the strongest relationship with the probability for project success followed by risk analysis. Risk identification had the weakest relationship with probability for project success, but was within the range of moderate strength.

5.3. Recommendation

At the policy level, stakeholders should focus on introducing risk management training programs for head teachers and other persons involved in the management of public secondary schools. The training program should incorporate content on all the four steps of the risk management process (risk identification, risk analysis, risk treatment, and risk control) because all these have been found to have a significant influence on the implementation of school project. Policy makers in the education sector should also tighten regulations that require management teams of public secondary schools to apply risk management practices.

At the school level, head teachers and their management teams should focus on improving the risk identification, risk analysis, risk treatment, and risk control practices in order to increase the probability for successful implementation of projects. The practices can be improved by developing written policies and procedures that guide the application of four risk management processes. The schools' management teams should develop written guidelines on how risk management should be done and focus on developing a risk management culture. The risk management practices can also be enhanced by ensuring the involvement of all key stakeholders.

5.3.1. Suggestions for Further Studies

The current study was limited to public secondary schools located within the County Government of Kiambu. Future studies should consider replicating the same study in public secondary schools located in other counties so as to support the generalization of findings. Researchers should also consider replicating the same study in other public institutions such as health facilities. The current study was also limited to four aspects of risk management: risk identification, risk analysis, risk treatment, and risk control. Future studies should explore other aspects of risk management and how the influence the implementation of projects in schools and other public institutions. Lastly, the current study was able to answer questions regarding what relationship existed between risk

management practices and implementation of school projects. It was also able to determine the direction of the relationship. However, the study was not able to determine why the relationship existed due to methodological limitations. Future researchers should consider employing qualitative research design in order to provide an in-depth understand of why the four risk management practices influence project implementation in schools.

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