PROJECT MANAGEMENT PRACTICES AND SUCCESS FACTORS OF DIGITAL LITERACY PROGRAMME IN WESTERN KENYA

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Project Management Practices and Success Factors of Digital Literacy Programme in Western Kenya

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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This thesis has been submitted for examination with our approval as the University supervisors.

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DEDICATION

This thesis is dedicated to my father Mr. George Muluka, who ensured I get basic education and always reminded me that a journey of a thousand miles begins with a single step, my children Deshawn Muluka and Adrian Muluka for giving me ample time during my research period. I also dedicate this research to my late grandmother Susan Wanga Attika whose love, unselfish support and example over many years laid the foundation for the discipline and application necessary to complete this work and from whom I learned lessons larger than my life.

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ABBREVIATION AND ACRONYMS

ANOVA	Analysis of Variance
CDF	Constituency Development Fund
CPM	Central Planning and Projects Monitoring Unit
CRM	Customer Relationship Management
CSF	Critical Success Factors
DLP	Digital Literacy Programme (Project)
GOK	Government of Kenya
ICT	Information Communication Technology
IT	Information Technology
KICD	Kenya Institute of Curriculum Development
KMO	Kaiser-Meyer-Olkin measure
M&E	Monitoring and Evaluation
MOEST	Ministry of Education, Science and Technology
MOICT	Ministry of Information, Communication, and Technology
NACOSTI	National Commission for Science, Technology, and Innovation
NGO	Non-Governmental Organization
PM	Project Management
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMOs	Project Management Offices
R&D	Research and Development
SDGs	Sustainable Development Goals
SPSS	Statistical Product and Service Solutions
TOE	Technical, Organizational, and Environmental
UN	United Nations
UK	United Kingdom

DEFINITION OF TERMS

Project Management Practices	Refers to the extent of adoption of project management knowledge areas, i.e., a range of methods used by project managers to execute projects (Abudi, 2011; Alotaibi, 2019).
Project Risk Management	Is the art and science of identifying, analyzing, and responding to risk throughout the life of a project and in the best interests of meeting project objectives (Pimchangton & Boonjing, 2017; Schwalbe, 2015).
Project Scope Management	Includes all processes required to ensure that the project includes all the work required and only the work required to accomplish the project successfully (PMI, 2013).
Project Stakeholder Management	Process of identification of stakeholders, stakeholder engagement planning, and management of stakeholder engagement and control of stakeholder engagement (Dagli, 2018).
Success Factors	Project success measures to ascertain whether the project is completed on schedule and within budget and meets quality specifications (Akbar & Shahid (2023).
Project Communication Management	All the processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information where you plan for communications, implement communications plan, and monitor communications (PMI, 2013).
Project Complexity	Technical, organizational, and environmental aspects that make it difficult to attain the intended project outcomes like; experience with technology, number of tasks, goal clarity, resource availability, skills availability, project team size and dependencies on the other stakeholders (Bosch-Rekveldt, Jongkind, Mooi, Bakker &Verbraeck, 2011).

ABSTRACT

The main objective of this study was to explore the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya. Specifically, the study sought; to assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya; to evaluate the relationship between risk management and success factors of Digital Literacy Programme; to determine the relationship between stakeholder management and success factors of Digital Literacy Programme; to determine the relationship between scope management and success factors of Digital Literacy Programme; to determine moderating effect of project complexity on the relationship between project management practices and success factors of Digital Literacy Programme. This study was necessitated by the need to understand the relationship between project management practices and success factors, considering that not all the stakeholders involved in the first phase of Digital Literacy Programme, viewed the Programme as successful highlighting a concern about success measurement criteria and practices involved in the project. Ultimately, the best judge of project success is the stakeholders involved in the project. In this study, project complexity was analyzed as a moderating variable due to its influential role in the determination of project success. The target population for this study comprised of 4337 headteachers in 4337 public primary schools in Western Kenya region namely Kakamega, Bungoma, Busia, Kisii, Kisumu, Migori and Vihiga and 7 County Directors of Education in the seven devolved county units. Stratified random sampling design was used to select 354 respondents from the seven counties Western Kenya. Primary data was collected using self-administered questionnaires. Pilot study was conducted to test validity and reliability. After collecting data and subsequent cleaning, the data was processed using descriptive analysis and multiple regression analysis performed to determine the relationships between project management practices and success factors of Digital Literacy Programme. Data analysis was done using Statistical Package of Social Science. In the findings of Analysis of Variance, the coefficients indicated that project management practices had a statistically significant contribution in the prediction of success of Digital Literacy Programme. Communication management, risk management, stakeholder management, and scope management were significant at 5% level of significance. From the findings, project complexity had a significant moderating effect on the relationship between stakeholder management and success factors of Digital Literacy Programme and as well as between scope management and success factors of Digital Literacy Programme whereas the interaction of project complexity with communication management and risk management was insignificant. The study concluded that project management practices were related to success factors of Digital Literacy Programme in Western Kenya and that improvements in project management practices will clearly improve on project success rates hence a better understanding of the relationship. The study recommends continuous application of project management practices and development of policies that support, training, standardization, and institutionalization of project management practices. Training on management of project complexity is also recommended.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

There is substantial research supporting the value of institutionalizing project management practices in organizations. However, its effective implementation in many organizations especially in the public remains elusive despite the different contexts of application. Ajmal, Malik and Saber (2017) concur with the above assertions noting that identifying practices that contribute to successful project management is still a challenge with term "project success" also subject to different opinions. Crispim, Silva, and Rego (2019) opine that project management practices provide guidance concerning projects to ensure better management of resources, within the most common constraints of time, cost, and quality.

The subject of project complexity continues to be extensively explored in project management studies because of its contribution towards the failure of major projects in terms of cost and time overruns (Qazi, Quigley, Dickson & Kirytopoulos, 2016). Complexity is inherent to many projects, due to strategic issues, technological advancements, and huge investments (de Rezende, Denicol, Blackwell, and Kimura, 2022). Numerous theoretical discussions about the definition of project complexity and the criteria used to measure have also come up but there is still a lack of consensus about the subject (Morcov, Pintelon and Kusters 2020; Kimaru, 2019).However, project complexity is recognized as potent characteristic that influence, usually in a negative way, the outcome of development projects and as such requires attention (Butler, Vijayasarathy, & Roberts, 2020).

Gomes, Carvalho and Romão (2021) opine that the success of the project has been the center of attention in the literature for numerous reasons, mainly, helping identify the achievement of project objectives, evaluate projects in terms of cost, time and quality,

strategic alignment of projects to organizational objectives. Varajão (2016) asserts that, although there are many studies that focus on different aspects of project success like, for instance, the success factors or the criteria for success assessment, there are limited studies that mention the processes or practices resourceful in evaluation of project success.

The Iron Triangle model (criteria of time, budget, and quality) as advanced by Atkinson (1999) is a popular criterion for measuring project success and has been cited by many scholars: for this reason, this study adopts it as one of the fundamental models to evaluate the relationship between project management practices and success factors of a project. Salman, Jaafar, Malik, Mohammad, and Muhammad (2021) posit that there are several project management practices widely described in literature and are significant to achieve project success which include management of integration, scope, time, cost, quality, resources, communications, risk, procurement, and stakeholder. The PMBOK guide proposes a set of skills and tools that increases the probability of project success, but it is important to take note that not all skills and techniques can perform uniformly in all types of projects necessitating the need to have a predetermined criteria to measure project success (Akbar & Shahid, 2023).

According to PMI (2013) pulse research findings, 55% of project managers agreed that effective communication with stakeholders enhanced the chance of being successful. Effective project communications ensure that right information reaches the right persons in a timely manner and cost-effective way. Carvalho (2013) posit that communication management has occupied an outstanding position in the literature on project management with several authors arguing that it is strongly associated with the projects' failure or success. Effective communication allows projects to be executed smoothly and on time and ensuring team members are aligned to the project goal. This enables stakeholders to buy-in and own project decisions and celebrate milestones Čulo & Skendrović, 2010). The same views are shared by Shakeri, and Khalilzadeh (2020) who assert that one of the critical factors in the success of projects is communications management and timely distribution of information among all the project stakeholders to control the project's time and cost.

Poorly implemented risk management practices in projects have been highlighted in literature as a cause of project failure. All projects are inherently risky since they are unique, constrained, complex, assumptions based, and performed by people (Kishk and Ukaga, 2008). However, there is limited research on the relationship between risk management practices and project success factors which highlights a gap in the literature. Studies have shown project risk management has a positive direct association with project success (Ibrahim & Yong, 2019; Varajão, 2016), a relationship which this study intends to explore in the context of success factors of Digital Literacy Programme.

Shakeri, and Khalilzadeh (2020) opine that the success of the project depends heavily on communication and collaboration between stakeholders, such that project managers spend most of their time communicating effectively with team members and other project stakeholders. Many scholars have cited "the ignorance or poor stakeholder management" as one of the key reasons responsible for project failure (Aaltonen, 2010). Various studies have also claimed that the inability of project managers to consider the concerns, claims and influences from project stakeholders is a reason for project failure and highlighted the importance of managing stakeholders (El-Sawalhi & Hammad, 2015; Wessinger, 2012). As a result, the management of project stakeholders is now widely acknowledged as an essential part of project management and as a factor contributing to project success. As is evident, the underlying assumption in the majority of project stakeholder literature is that stakeholder management is not only a critical success factor for project success (Atkin, Brian & Skitmore, 2008; El-Sawalhi & Hammad, 2015; Jepsen & Eskerod, 2013; Yang *et al.,* 2011), but an inevitable part of any project and project management process.

According to Al-Rubaiei, Nifa and Musa (2018) the area of project scope management as a critical factor of success requires further exploration and investigation yet it has received little attention from scholars. Very few projects as per Standish Group (2018) survey are completed in line with original plans and within cost constraints. Quite often, changes occur in projects due to unforeseen challenges, but uncontrolled changes impact on project scope resulting to missed deadlines, budget overruns, and directly affecting quality of the project (Ahmad, Rehman & Ilyas, 2019).

Project management practices refer to fundamental issues inherent in the project, necessary for stakeholders and project team to work in an efficient and effective manner within constraints of time, budget, quality and scope (Ocharo & Kimutai (2018).There are a few empirical studies that explain the relationship between project management practices (communication management, risk management, stakeholder management and scope management) and project success with the results achieved underlining practices related with cost, time, and scope management are the most well stablished (Ibrahim &Yong, 2019). In the same vein, Mata, Martins and Inácio (2023) opine that literature indicates that time, budget, and quality are not the only criteria for project's success, but the handling of complexity must be put into consideration. There are limited studies on the role of project complexity in moderating the relationships between project management practices and success criteria (Crispim, Silva & Rego, 2019; Papke-Shields *et al.,* 2010).

Project complexity offers a strong analytical perspective for examining relevant challenges in projects which determine the success of a project and for this reason can be considered as a possible moderating variable (Hartono, Wijaya & Arini, 2019). Therefore, this study examined the moderating effect of project complexity on the relationship between project management practices (communication management, risk management, stakeholder management and scope management) cited by most researchers and success factors while also assessing the relationship between the practices and success factors.

1.1.1 Global Perspective of Project Management Practices

According to Project Management Institute (2017) about 21% of World organizations have institutionalized and standardized project management for their projects and the project success rates have improved significantly. In a study involving 50,000 projects around the world by Standish Group termed the Chaos Report (2015), the results indicated that 29% of the projects were successful, 52% of the projects had stagnated and 19% of the projects were deemed to have failed (Hastie & Wojewoda, 2015).

The findings from the UK sector revealed that 41% of the reported projects were judged to be completely successful (using time, budget and quality specification), though some drawbacks were reported with a similar finding being reported in another study by Abu-Hussein, Alawneh and Al-Debei (2016) which explored the use of project management tools and techniques by the public sector in Jordan by surveying 50 industrial public firms (Akande *et al.*,2018). The findings of from these studies concluded that the use of project management tools and techniques among the public sector companies was considerably low, but when practiced efficiently would result in tangible benefits in all aspects of planning, scheduling, and monitoring the time, cost, and specifications of projects.

According to Standish Group (2018), 24% of the global projects were terminated prematurely, 32% of were delivered on time, within budget and met quality requirements while 44% projects were over budget with schedule overruns and didn't fulfil their scope and quality specifications requirements. This finding corroborates that of Abuya (2015) who notes that, from an analysis of 10 surveys conducted in United Kingdom, the findings reveal that in the last decade there has been a general perception of dissatisfaction over project success and the need to improve on practices that would enhance success rates. Ouko (2014) observed from his studies that in North America, project management has a potential still to be fulfilled. He pointed out that news media in North America are littered with stories of failed projects, citing the launch of the Affordable Care Act (Obamacare) registration website as an example of which he described as a disaster.

1.1.2 Regional Perspective of Project Management Practices

Lawani (2018) asserts that project management in Africa remains a field that is still novice despite advancement in the developed world. These authors further assert that, on average, 8 out of 10 project managers are accidental and often lack adequate project management (PM) knowledge base. PM training also falls short of some fundamental knowledge areas with respect to management of risk, communication, scope, and stakeholder; and organizations which are supposed to be centered on programs and portfolios are, in practice, project-oriented organizations by default. Ndawula, Katerega and Abubakali

(2017) also highlights the plight of education sector projects being championed by the government of Uganda specifically, in the institutions of higher learning meant build competition, technology, and development. Lawani (2016) endorses the above argument by asserting that there is need for better understanding of project management practices in government institutions of developing countries.

Thomas, Musila and Bredillet (2012) assert that most projects in Africa involve multiple stakeholders, including governments, international organizations, local and international financial institutions, private companies, nongovernmental organizations, and local communities. These multiple stakeholders are known to have different and often divergent interests as well as different power standings which heavily influence implementation of projects in Africa. Rwelamila and Purushottam (2012) further notes that countries like Tanzania, Malawi, Mozambique, and Angola, are examples of African countries that paint a picture of project failures across both public and private sectors. The reasons for project failures as observed by several studies reveal that lack of maturity in project management in developing countries (Ajmal *et al*., 2017; Fitsilis & Chalatsis, 2014; Crawford, 2014). For instance, Msafiri (2015) while reviewing the studies contacted in Ghana on causes of delay and cost overruns in construction of groundwater projects in developing countries notes that these researchers indicated that 75% of the projects in Ghana exceeded the original project schedule. Bottlenecks found include monthly payment difficulties; poor contract management; material procurement; inflation; and contractor's financial difficulties implying lack of preparation and poor application of project management practices.

1.1.3 Local Perspective of Project Management Practices

The Government of Kenya is still pursuing development agenda aggressively through Vision 2030(Ndung'u, Thugge & Otieno, 2015). Vision 2030 seeks to transform the country into a newly industrialized, middle-income country providing a high quality of life to all its citizens in a clean and secure environment. The vision is anchored on three key pillars: economic, social, and political governance. Critical to the realization of the

Kenya Vision 2030 are fundamental flagship projects in various sectors that are already underway like Digital Literacy Programme (DLP), modernization of Jomo Kenyatta International Airport, Lamu Port-South Sudan-Ethiopia-Transport (LAPSSET) Corridor project, Secondary Education Quality Improvement Project *(*SEQIP*)*, Standard Gauge Railway (SGR) among others (Kasuku, 2012; GOK, 2007).

According to Kimani and Kimwele (2015) developing countries like Kenya, project delays are highly common. Moreover, when project management practices are influenced by different operational parties and practices, coordination, and management of the same becomes impossible with each operational party influencing a project in their direction and dissatisfaction with project deliverables is a thorny issue. These views are also shared by studies done by Kagiri and Wainaina (2017) on time and cost overruns in power projects in Kenya. Kimani and Kimwele (2015) recommend that organizations should institutionalize new project management practices to improve on projects delivery, cost saving, improved service to the nation and better organization management. Musau and Kirui (2018) recommends adequate budgets, timely issuing of information, streamlined management structures and efficient legal processes as some of the new project management practices that can be adopted.

A report by GoK (2012) and World Bank (2013) on construction of Thika Superhighway reveal that the project had been earmarked for completion in 2011 but it was realized a year later with it cost surpassing the allocated budget amount by an extra Kshs.7 billion. These reports attribute this to political differences arising from the coalition Government, lack of sufficient consultation and involvement with stakeholders, bad weather, poor technology and since the project was never hedged, it suffered from fluctuation in the Kenyan economy. This scenario seems to be affecting key projects among them, infrastructural projects, Digital Literacy Programme, Water, and Irrigation projects like Galana/ Kulalu Food Security Project among others.

However, even with the forgoing efforts from project management practitioners and academicians to find out why projects are failing and recommend key best practices, these

initiatives have not led to the desired effects, or the key practices were not understood. A review from Ikejemba, Mpuan, Schuurm and Van Hillegersberg (2017) reveals that the symptoms of project failure cut across Africa, and Kenya is among them. These symptoms according to these authors represent a significant plethora of bad project management practices. The symptoms highlighted are stakeholder's dissatisfaction with project deliverables, archaic project missions, little top management support, outdated management practices, inappropriate schedules and plans, lack of stakeholders consultation, inappropriate recruitment and training of accidental project managers and core teams, lack of sufficient monitoring and feedback during project implementation, inabilities to handle unexpected crises and deviations from project plans, excessive power and politics, negative impacts from environmental events and lack of urgency especially in public sector projects (Ngundo & James, 2018; KPMG, 2013).

1.2 Statement of the Problem

Digital Literacy Programme is one of the key flagships' programmes implemented by the government of Kenya meant to prepare young people for todays and future realities. Different stakeholders were involved in implementation the program to offer their expertise and improve the success rate of the programme. Phase one of program covering 21,638 public primary schools is 100% complete, 1,167,245 digital devices have digital content for grade 1-3 installed, over 331,000 teachers have been trained and over 22,000 schools have also been connected to the grid (MOES, 2019). However, some stakeholders deemed the success factors for the Programme and implementation practices to be unclear to determine whether it was a failure or a success (Morara, Makwora, & Abuya, 2020). A project is as successful as the stakeholders think it is (Yang *et al.*, 2011). The main problem is that there is a disconnect among the various stakeholders on implementation practices and success factors of the Programme. Studies have shown that lack of understanding of the relationship between project management practices and success factors, could lead to different perceptions of success factors. Without clarity regarding the criteria for measuring success of the Programme and its relationship to project management practices, the core objective of transforming learning in Kenya into a 21st

Century education system could be at risk of failure hence the public may not get value for the taxes paid to government. Extant literature has it that management of communication, risk, stakeholders, and scope are most cited variables that have a direct relationship to success factors of many projects. Studies on project complexity indicate that it is one of the factors that moderates project success, given that it affects cost, time and quality objectives of a project (Bosch-Rekveldt, 2011; Omonyo, 2018; Kimaru 2019). However, there is no empirical evidence reviewed of such studies having been conducted in Kenya which this study will address. It is against this backdrop that this study purposes to assess the relationship between project management practices and success factors of Digital Literacy Programme (DLP) in Western Kenya.

1.3 Research Objectives

The study was guided by the following general and specific objectives.

1.3.1 General Objective

The general objective of this study was to explore the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.

The study considered the general objective, five specific objectives and five research hypotheses.

1.3.2 Specific Objectives

The specific objectives that guided the study were:

i. To assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.
ii. To determine the relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.

iii. To examine the relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.

iv. To establish the relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.

v. To determine the moderating role of project complexity on the relationship between the project management practices and success factors of Digital Literacy Programme in Western Kenya.

1.4 Research Hypotheses

The study was guided by the following null hypotheses: -

Ho1: There is no significant relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.

Ho2: There is no significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya**.**

Ho3: There is no significant relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.

Ho4: There is no significant relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.

Ho5: Project Complexity has no significant moderating effect on the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.

1.5 Significance of the Study

The study contributes to the body of knowledge by adding empirical findings on the relationship between project management practices and success factors of projects (Digital Literacy Programme), and how project complexity moderates this relationship. The study

depicts how project management practices in public primary schools relate to project success factors by examining the direct and moderating relationships that exist among these variables. It provides relevant information to the public primary schools that will enable them draft policies that elevate and institutionalize their project management practices. This study's findings are of applicable use to public primary schools in identifying policy gaps and in the formulation of corrective measures at the policy level to ensure higher success rates of school projects. The findings of this study constitute useful feedback to the Ministry of Education on the implementation of Digital Literacy Programme, considering the Programme is currently on the last phase (3rd Stage) but some stakeholders feel it has mixed results with regards to success factors. The study emphasizes the role of stakeholders in implementation of project management practices and determination of success factors for projects in public sector Programme.

1.6 Scope of the Study

The study was undertaken in seven counties found in Western Kenya region which are Kakamega, Bungoma, Kisumu, Kisii, Migori, Busia and Vihiga. Western Kenya region stretching from the county of Kisii to the county of Busia: bordering Uganda and Tanzania. Therefore, the region guarantees large sample from the many public primary schools represented and so is the diversity of the schools. Secondly, the schools in this region have lower digital literacy levels compared to others. The period under review in the study was between 2013 and 2019 covering phase one of the project implementation plan schedule roll out. The study covered 4337 public primary schools and the variables evaluated were communications management, stakeholder management, risk management, scope management, project success factors and project complexity. The study was pegged on only three theories, namely, Theory of Constraints, Stakeholder Theory, and Complexity Theory respectively.

1.7 Limitations of the study

The limitations included some of the respondents not filling or completing the questionnaires. There were inadequate responses to some questionnaires considering that the responses sought depend on ability of respondent to recall the data pertaining the subject. Some respondents were skeptical about the information being sought. This was solved by assuring the respondents of utmost confidentiality and disclosing the purpose and intention of the study as academic. The introduction letter obtained from the University and permit from NACOSTI helped to avoid suspicion and enabled most primary school heads and County Education Directors to disclose much of the information sought by the study. With the Government directive to close learning institutions following the surge in the spread of Corona Virus, some respondents did not have had time to fill in the questionnaires. This was mitigated through email and text messages reminders to the respondents during the period of administering the questionnaires. On the issue of anticipated understanding of technical project management terms, the researcher endeavored to simplify the questionnaire by use of simple vocabulary in the questions. The researcher conducted pilot-testing of the questionnaire before administering it in the main study to address issues the respondents had with the questionnaire.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter focuses on the theoretical and empirical literature review of project management practices and project success as the foundation of this study. It outlines the conceptual framework which illustrates the relationship between dependent (project success), independent variables (communication management, risk management, stakeholder management and scope management) and moderating variable (project complexity).The chapter also explores relevant theories that the researcher used to address the research gap as well as empirical review of the previous studies , a critique of the empirical literature related to the study, with a summary of the review winding up the chapter.

2.2 Theoretical Review

This study was founded on the Theory of constraints (Goldratt, 1984), Stakeholder theory (Freeman, 1984), and Complexity Theory.

2.2.1 Theory of Constraints

This theory was advanced by Goldratt (1984). It is argued that this theory should be applied initially for project time management, although it also can be used for project risk assessment and cost management. Moreover, timelines are a major constraint in project execution because of the need for positive cash flow, reducing contingency costs of delays and need for scope changes. Therefore, the two key underlying features in using theory of constraints are the availability of critical resources, and the ability of organizations to mobilize these resources in a timely manner to meet project schedules and maximize resource utilization (Parker, Parson & Isharyanto, 2015).

According to Parker *et al.* (2015) this theory is also applicable throughout the five project processes, as outlined in the PMBOK Guide (PMI, 2013) to augment appraisal of

constraint implications for each of the processes. He argues that during project initiation stage, project managers can minimize uncertainty and risks by defining specific project objectives, managing key stakeholders' expectations, and developing strong communication ties with the client to identify potential, foreseeable risks. In the planning phase, project managers can minimize uncertainty and risk by employing methods which have proven successful in the past, using products or materials which have been "tried and tested" and utilizing subcontractors when resources are constrained. In the monitoring and controlling phase, progress and performance can be measured against key performance indicators for time, cost, scope, and quality objectives.

This theory has been critiqued by scholars on the basis that it focuses on short-term goals while emphasizing on volumes rather than quality thus limited in scope (Trojanowska & Dostatni, 2017). As a consequence of oversimplification, the theory of constraints has been questioned for lack of focus on non-constraints which may become constraints in dynamic environments (Izmailov, Korneva & Kozhemiakin, 2016), lack of focus on multiple performance measures (Şimşit, Günay & Vayvay, 2014) and lack of buffer management (Mishra, 2020).It has also been argued that the over simplification tendencies in theory constraints, this theory is likely to restrict improvements that would have been possible through management of the constraints and therefore the simplification though useful becomes counterproductive (Smith, 2019).

According to Sarkar, Jha and Patel (2021), the success of project depends on effective management of constraints in the project. All projects are constrained by a variety of factors including risks, cost, and quality hence its crucial to understand each of the constraints and manage them, if the project is to succeed. Moreover, Mukhongo (2020) opines that project timelines are a major constraint in project implementation because of the need to minimize contingency costs of delays and changes in scope in line with positive cash flows.

Based on the foregoing literature, the theory of constraints therefore explains stakeholder involvement, risk management, and scope management whereby important issues dealing

with the triple constraints of projects are addressed resulting to reduced delays in schedule and optimal use of resources hence the likelihood of delivering projects on-time, within budget and to scope and quality specifications. This theory is relevant in this study as it highlights the constraints of project scope, project quality, project timeliness and project budget that hinder can hinder success of Digital Literacy Programme. This theory was used by Ochenge (2018) study on "Project Management Practices and Performance of Road Infrastructure Projects Done by Local Firms in the Lake Basin Region, Kenya".

2.2.2 Stakeholder Theory

Stakeholder theory was postulated by Freeman (1984), and it states that every individual or a group involved in a project will always safeguard their interests. The theory focuses on stakeholders' management in relation to the project and its outcome. This theory examines personalized preferences while attempting to satisfy as many of those preferences as possible. Generally, stakeholder theory argues that every individual or a group involved in a project do so to safeguard their interests. Stakeholders are individuals or groups that have interests on the project that is being undertaken (Nasr, Kashan, Maleki, Jafari &Hasemi, 2020; Macharia, 2013). This theory is further supported by Joseph and Tranos (2018), and Friedman (2006) who in agreement, are of the view that the organization should be thought of as grouping of stakeholders and the purpose of the organization is to manage their interests, needs and viewpoints.

The theory suggests that project managers need to ensure that all stakeholders are satisfied with the project implementation process and that stakeholder' interests and their relationship is well taken care of for the long-term success of the project. Managers must formulate and implement project processes which satisfy all and only those groups who have stake in the project. The basic idea of stakeholder theory is that the organization has relationships with many constituent groups and that it can engender and maintain the support of these groups by considering and balancing their relevant interests (Kirsi, 2010). This theory also advocates for managers formulating and implementing project processes which satisfy all and only those groups who have stake in the project.

This theory over the years has been accused of being vague and ambiguous to the way organizations work. Some critics argue that the problem of heterogeneity within stakeholders and pressure groups creates a situation where multiple interests and multiple roles arise and therefore accountability suffers. This creates a situation where any management decision can be justified by referring to one of the stakeholders. Furthermore, while the organization has its interests, these interests are determined by its relations to primary and secondary stakeholders and therefore should a change in the relations happen, the interests of the organizations change accordingly (Maharaj, 2018). These views are supported by Antonacopoulou and Meric (2015) who noted that members within a group or category are not all homogeneous and therefore stakeholder theory ignores intra-stakeholder heterogeneity.

According to stakeholder theory, project consists of various stakeholders whose participation is critical for project success, a view consistent with this study. The theory postulates that project managers need to ensure that all stakeholders are satisfied with the project implementation process and that stakeholder' interests and their relationship is well taken care of for the long-term success of the project. They should be involved in all stages of the project lifecycle, by needs addressing their information (communication) needs, and be involved in determining success factors of the Programme (empowerment).

2.2.3 Complexity Theory

According to Menon (2019) complexity theory originated from meteorologists' studies seeking to manage weather systems using mathematical tools and models. Complexity theory explains how as system constituting several elements continuously interact with each other and spontaneously organize and reorganize themselves into increasingly elaborate structures over time (Dao, Kermanshachi, Anderson, Shane & Hare, 2016). Complexity theory is based on research in the field of natural sciences that examines insecurity and non-linearity, highlighting interactions and feedback loops whose systems constantly change (Mata, Martins & Inácio, 2023). A project consists of interconnected elements or parts with related and unpredictable changes, and this represents the attributes

of complex systems. Moreover, specific project deliverables are expected once projects are implemented and complete, complexity theory characterizes outcomes as unpredictable and chaotic in nature (Menon, 2019).

Dao, *et al.,* (2016) posits that recent studies have focused on the identification of complexity attributes more than any other topic in the field of project complexity as a factor that helps determine planning and control practices, hinders the identification of goals and objectives, or a factor that influences time, cost, and quality of a project. Complexity in a project decreases when unexpected or unforeseeable conditions become known during a project's life cycle (Menon, 2016). Moreover, some studies have identified three major attributes of complexity as organizational complexity, technical complexity, and environmental complexity (Bosch-Rekveldt, 2011; Kimaru, 2019; Gautam & Kiridena, 2019). Organizational complexity addresses the view that a project is a task containing many interdependent elements while technical complexity deals with complexity matter pertaining to the transformation processes, which convert inputs into outputs (Dao, *et al*.,2016). The environment context refers to the market space or a firm's business arena and includes its competitors, industry, engagement with business partners and the government (Kimaru, 2019).

This theory suggests that the delivery of project within budget, timeliness and to agreed quality standards is unpredictable, and that the success or failure of projects is pegged on effective project management practices. In line with views of Larsen-Freeman (2017) and Mata, *et al.,* (2023), complexity theory is the most suitable theory for evaluating of moderating effect of project complexity for the study conceptual framework. This theory was used by Dartey-Baah, (2022) study on "The relationship between project complexity and project success and the moderating effect of project leadership and roles in the construction industry of an emerging economy.". It was used by Unegbu, Yawas, and Dan-Asabe, (2022) on" An investigation of the relationship between project performance measures and project management practices of construction projects for the construction industry in Nigeria.".

2.3 Conceptual Framework

A conceptual framework is defined as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Macdonald, Wilson, Martinez & Toossi, 2015). A conceptual framework refers to a research tool intended to assist a researcher to develop awareness and understanding of the situation under scrutiny and to communicate it. It is a diagram that visually shows the relationship between the independent and dependent variable of the study.

The study entailed three composite variables which were categorized as independent variable, dependent variable, and moderating variable. The independent variable comprised of project management practices employed by Digital Literacy Programme project managers at the public primary school level to ensure success of the project. The dependent variable was project success while project complexity was the moderating variable. The measure of the independent variable included the following: communications management, risk management, stakeholder management, and scope management. The measure of the moderating variable was project complexity.

The relationship between the three variables was diagrammatically illustrated in Figure 2.1. The classic criterion of project success is a measure of the performance of a project against its main design parameters, which are schedule, budget, and quality (Luo & Yin, 2014). The study adopted be deemed as successful in this study, by measuring the following indicators: within budget, within timelines and adherence to quality specifications (Akbar & Shahid, 2023).

The project communication management processes identified from reviewed literature under consideration are planning communications, managing (implementing) communications, and monitoring communications (Zandhuis &Wuttke, 2019; Perumal & Bakar, 2011; Culo & Skendrovic, 2010).Risk management practices identified from literature that influence project success an adopted for this study includes, risk identification, risk analysis, and risk response planning (Pimchangton & Boonjing,

2017).Stakeholder management processes that informed the choice of practices that influence project success for the study are stakeholders' identification, engagement and empowerment in project review and outcome (Tero, 2014).Project Scope Management practices will address collection of requirements, validation of changes and controlling of scope (Abdilahi, Fakunle & Fashina, 2020; Ogunberu, Olaposi, & Akintelu, 2016; PMI, 2013).

As presented in Figure 2.1, the model proposes that project success is a function of communication management + risk management + stakeholder management + scope management which is also moderated by project complexity. According to the model, the interplay between the independent variables (project communication management, project risk management, project stakeholder management and project scope management) and moderating variable (project complexity) accounts for success in Digital Literacy Programme.

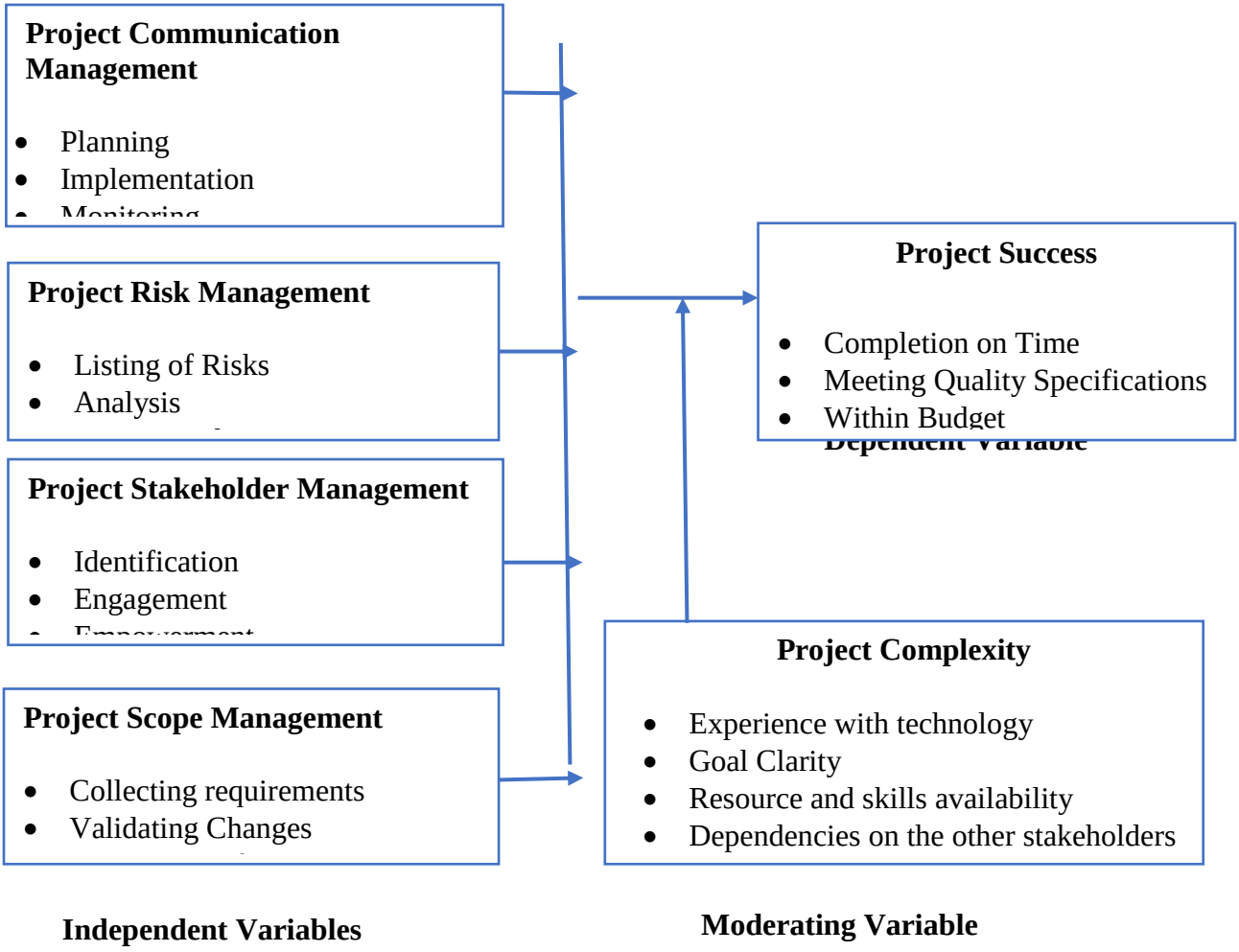

Figure 2.1: Conceptual Framework

2.3.1 Project Communication Management

Project communication management processes provide the critical link among people and information that are necessary for successful communication. These views corroborate the key studies around communication done by Perumal and Bakar (2011) and Culo and Skendrovic (2010). According to PMI (2017), project communication management includes the process required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information. Project

communication management consists of four processes: communication planning; information distribution; performance reporting; and managing stakeholders (Ndawula, Katerega & Abubakali, 2017).

The project communication management processes identified from reviewed literature under consideration are communication planning, managing communication (timely and appropriate collection, creation, distribution, storage, and retrieval of project information) and monitoring communication (meeting project information and stakeholders' needs). (PMI, 2013; Perumal & Bakar, 2011; Culo & Skendrovic, 2010). In appropriate communication management in projects leads to problems such as increased costs, and time that exceeds project estimates (Setiawan, Hansen & Fujiono, 2021). Moreover, the causes of cost and time overruns in projects is a combination of various communication problems. In global context communication gap is considered as challenge in projects and that lack of communication can cause delays in projects and may lead to failure (Yap, Abdul-Rahman & Chen, 2017).

Communication management can be divided into 3 stages as recommended by Setiawan, *et al*. (2021): planning, executing (implementing), and monitoring which this study will focus on. This study adopts a quantitative approach to assess the relationship between project communication and project success, as described by Setiawan, *et. al.* (2021), is traditionally evaluated by, time, cost, and quality which are the three indicators for achieving project success. The level of communication planning, implementation and monitoring is measured using, a 5-point Likert Scale (Setiawan, *et. al.*, 2021; Culo & Skendrovic, 2010; Perumal & Bakar, 2011). The study also explores use of communication management plan, as a tool required for the successful management of communication.

2.3.2 Project Risk Management

According to PMI (2017) the term "project risk" refers to an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives. Teller and

Gemunden (2014) assert that several authors support the view that risk encompasses both threat and opportunity; they emphasize that both opportunities and threats should be considered in the processes of risk identification and analysis. Best practice project management standards imply that effective risk management leads to project success (Didraga, 2013). Mhirat and Irtemeh (2017) posit that the purpose of project risk management is to implement projects within approved budget, on time and within the required specifications(quality) which are the success factors for a project.

To enhances project success, understanding potential risks is paramount, to systematically and quantitatively assess these risks, anticipating possible causes and effects, and respond decisively. Therefore, application of risk management practices enhances quality improvement and cost estimation by anticipating and mitigating potential risks before a project begins. Risk management practices provides the management with organized risk information early enough to apply corrective actions that will allow realistic schedule and cost estimates and assure successful completion of the project (Pimchangthong & Boonjing, 2017; Kishk and Ukaga, 2008).

Teller and Gemunden (2014) asserts that the importance of frequent and continuous utilization of risk management practices (project risks identification, analysis of the identified project risks, defining and implementing risk response actions, and monitoring of project risks to find out whether the risk responses are effective or require review) by experienced project managers has been emphasized by several authors. In an example, he observed that, findings from the interviews of Cagliano, Grimaldi and Rafele (2015) indicated that risk management is deliberately used to deliver messages to other stakeholders, with the aim of influencing their behavior, perceptions, and awareness of the situation and its attendant risks. Teller and Gemunden (2014) argue that although many studies suggest that risk management is related to project success, there are other studies that have shown that risk management underperforms in practice (Marcelino-Sádaba, Pérez-Ezcurdia, Lazcano& Villanueva, 2014).

Risk management has been closely associated with project management as one of the potential threats to the project, which may hinder achieving the pre-defined objectives and the success of the project (Mhirat & Irtemeh, 2017). Furthermore, Mhirat, and Irtemeh state that it is logical to link risk management components (risk identification, risk analysis, risk response and project success in terms of time, cost, quality, and stakeholder satisfaction considering several studies have found that risk management has positive impact on the success of projects which is consistent with the results of (Didraga, 2013; Al-Shibly *et al.*, 2013). The level of risk identification, analysis and response is measured using, a 5-point Likert Scale (Mhirat & Irtemeh, 2017; Pimchangton & Boonjing, 2017; Didraga, 2013; Al-Shibly *et al.*, 2013). The study also explores some of the tools required for the successful management of risk particularly the risk register, as well as the explore the relationship between risk management practices and project success and how project complexity moderates the relationship.

2.3.3 Project Stakeholder Management

Every project consists of different interests, and those who own these interests are called project stakeholders (Dağlı, 2018). Project Management Institute (2014) define stakeholder management as the systematic identification and analysis of stakeholders (aimed at facilitating the understanding of how to manage stakeholders) and action planning on how to communicate with and impact stakeholders.

According Khan *et al.* (2018) a well-designed and skillfully executed plan for stakeholder management and engagement fulfills multiple fundamental objectives: for primary stakeholders it aims at least to ensure attainment of the project goal within cost, time and other constraints and to the satisfaction of the client while for secondary stakeholders it seeks to minimize or possibly eliminate existing opposition to the project and to prevent the emergence of opposition in future, and to enable the project to take advantage of secondary stakeholders goodwill, knowledge, experience, show of support, and all other forms of practical assistance that they are able and willing to apply for the project.

Murungi (2015) while supporting involvement of stakeholders, asserts that it is impossible to satisfy all stakeholders involved in a project and that the choice of which stakeholders are key is inherently political and therefore ethical considerations must be considered in terms of their influence with regards to potential impact on project, interest, and networks. The number of stakeholders interested in the project can dramatically increase the complexity of the project considering each stakeholder has his/her needs leading to different priorities and conflicts (Ka, Geoffrey & Yang, 2015).

According to Dagli (2018) project stakeholder management has evolved from execution of management functions over time to identification of stakeholders, stakeholder engagement planning, and management of stakeholder engagement and control of stakeholder engagement. Stakeholder engagement involves development and sustainability of relationships between project stakeholders by listening and understanding their needs and concerns, while stakeholder empowerment entails giving power and control to project stakeholders to make informed choices and decisions as well as control usage of project resources (Okoth, 2012). Stakeholder engagement entails involving people who could be impacted by the project or can influence the project in decision making to ensure their needs and interests are met. This implies that an appropriate plan (stakeholder engagement plan) should be developed to engage the stakeholders throughout the project's life (Project Management Institute, 2017).

The extant research suggests that project success involves not only the iron triangle factors i.e., cost, time, and quality, but also the effective management of the stakeholders involved (Jepsen & Eskerod, 2013). Relationship between a project and the management of its stakeholders is central to the success of projects (Johansena, Ekambaram, Anandasivakumar & Youcef, 2015; Späth & Scolobig, 2017). In line with the above studies, Nguyen, and Mohamed (2021) suggest measurement of stakeholder management using seven items developed with consideration to the level of stakeholder engagement, including information, consultation, collaboration, co-decision, and empowerment. Responses were provided according to a 5-point Likert scale. Project success measurement variables included cost, time, quality, scope, and stakeholder satisfaction.

These measurements are consistent with other studies (Oyeyipo, Odeyinka, Owolabi and Ojelabi, 2019; Fraz *et al.*, 2016; Kelbessa, 2016). The study also explores the availability of and use of stakeholder register (forms) as a tool required for identification of stakeholders, their needs, and control of stakeholder engagement (O'Halloran, 2014; Roeder, 2013). The Likert scale is used to assess stakeholder engagement and empowerment, with success factors variables being within budget, within timeliness and adherence to quality specification.

2.3.4 Project Scope Management

According to PMBOK (2013) project scope refers to all the work or tasks that need to be done to deliver a product, service, or result with the specified features and functions. Further, there are three processes which entail project scope management, which consist of planning, controlling, and closing (Snyder, 2014). Derenskaya (2018) defines project scope as a description of the project work to be performed in terms of the expected results. According to PMI (2017) project scope management is concerned with defining and controlling what is and what is not included in the project. The PMBOK identifies six processes the entail successfully defining and controlling the project scope: plan scope management, collect requirements, define scope, create Work Breakdown Structure (WBS), validate scope, and control scope.

A review of literature on project scope management seem to agree, that scope management is a critical success factor as far as project success and performance is concerned. An efficacious scope management of a project certifies the successful management of other strategic project management parameters like time, cost, and quality (Nath & Momin, 2014). In agreement, Ramage (2018) asserts that project planning process includes scope management as a function of time, cost, and performance, and the project baseline grounds scope management to the project goals. Moreover, a properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stakeholders. Mizra *et al.*, (2013) opines that for delivery of a quality product, on time and on budget that meets customer's expectations, a clear vision for the product is required.

This entails clearly defining the project and product scope, goals, project drivers, constraints, among other considerations. This study conceptualizes collecting requirements, validating scope and scope control as the key attributes of scope management in this study like previous studies by Ramage (2018), and Mizra *et al.,* (2013).

2.3.5 Project Success

The term projects success continues to generate a lot of debate with no consensus regarding the criteria to evaluate success among project management practitioners and academicians (Gomes & Romão, 2016; Hussein, Ahmad & Zidane, 2015). According to Hussein *et al.* (2015) over the last two decades, there has been a lot of research on the concept of project success criteria. The benchmark for measuring project success varies among different stakeholders and perhaps it's the reason as to why stakeholders' differences remain a challenge in project management (Hammond, 2018). The authors note that the current research within this field could be grouped into the following three areas: an assessment of project success at or after project completion, the importance of defining project success criteria up-front in the project for managing the project and the potential threats and challenges influencing the initial definition of project success criteria.

In the same school of thought Rodrigues *et al.* (2014) notes that the present the main approaches reported in the literature review, suggests some consensus among authors about the criteria of time, budget, and quality compliance as core assessment elements of a project success. However, they posit that a number of authors with a contrary view argue that the success of a project is multidimensional (Han, Yusof, Ismail, & Aun, 2011;Serrador & Turner, 2015).Triple constraint (time, cost and quality) only assess the internal efficiency of the project or its management, so project outcomes and products success criteria, like client satisfaction, market share, or profitability, should also be considered (Rodrigues et al., 2014).

According to Gomes and Romão (2016) project success is so broad that its meaning varies across the different communities and cultures. They further add that with reference to studies conducted by Davis (2014) on "refining the search for project success factors: a multivariate, typological approach", there is no conclusive evidence or common agreement that has been reached so far to determine whether a project is a success or failure. Gomes and Romão, conclude that the idea of considering a project a successful or a failure, depending exclusively on whether it meets or fails the criteria for time, cost and quality is outdated. They further note that apart from the triple constraints (time, cost, and quality) aspects like objectives achievement and technical requirements need to be evaluated to determine success criteria. This study adopted project success as measured by cost, time, and quality in consonance with previous studies by Rodrigues *et al.* (2014), Mhirat and Irtemeh, (2017) and Akbar & Shahid (2023).

Table 2.1: Measurement of Project Success

Indicator	Scale	Questionnaire Item
Within Budget	5-Point Likert Scale (Strongly Agree, Agree, Disagree, Strongly Disagree)	Project completed within planned budget contributes to project success.
Quality Adherence	5-Point Likert Scale(Strongly Agree, Agree, Disagree, Strongly Disagree)	It is important to achieve the quality standards mentioned in the specifications for a successful project.
Timelines	5-Point Likert Scale (Strongly Agree, Agree, Disagree, Strongly Disagree)	Project is successful if completed within proposed timelines.
Quality Adherence	5-Point Likert Scale (Strongly Agree, Agree, Disagree, Strongly Disagree)	It is important to comply with technical specifications for project success.

Source: Akbar & Shahid (2023)

2.3.6 Project Complexity

Several studies have reviewed the literature on project complexity with many alluding to the fact that it has no widely accepted definition (Morcov, Pintelon and Kusters, 2020; Qazi*et al.*, 2016; Bakhshi & Gorod, 2016; Herszon & Keraminiyage, 2014). Morcov *et*

al., (2020) assert that the terminology itself being overloaded and over-used. However, the approach prevalent in the project management research and community of practice is that complexity affects negatively both project performance and project management performance. However, the lack of study on the moderating effect of project complexity on relationship between various project management practices and project success is quite visible with most of the studies indicating there is a strong correlation between project complexity dimensions and project success (Shahroz, Khan, Khushnood, Aslam, Khattak, & Abbas ,2021).

The correlation between project complexity, project risks, and project performance is still unclear in the project management field, and this can be attributed to unpredictability of projects in terms of problems and failures (Vida *et al.,* 2011). However, it is worth mentioning that the complexity can also negatively influence a project performance as well as project outcomes as the properties emerging from complexity can create certain new prospects. Furthermore, the success of a project therefore ultimately depends upon project performance and its related project complexity (Abdou, Yong, & Othman, 2016).

Bjorvatn and Wald (2018) opine that different studies have observed that project complexity reduces project management performance hence success, though so far research has failed to establish this causal relationship to address this belief conclusively. Dwivedi *et al.* (2012) suggests that, in many cases the size of the project is an important factor in planning resources, analyzing risk exposure, and estimating the time, less it becomes a failure factor. Furthermore, the project size factor is demonstrated through "scope creep", in the number of stakeholders involved in the project and it may be correlated with the team size as well. Poveda-Bautista *et al.* (2016) argues that complex projects have no recognizable standards to guide their management hence to lead complex projects to success; this complexity must be measured quantitatively suing a tool based on existing PM standards.

In line with this view Doa *et al.* (2016) recommends development of tool such as the Project Complexity Assessment and Management (PCAM) tool which is an Excel-based tool designed with a capability to measure "complexity" and it comprises of key indicators that are statistically significant to project complexity. This tool is meant to help project teams identify, assess, and manage project complexity. It also gives comprehensive reports that present the overall level of project complexity. This study adopted the moderating variable, project complexity, from existing research work by Hartono, *et al.* (2019), Bosch-rekveldt *et al*. (2011) and Kimaru (2019) in Technical, Organizational, and Environmental (TOE) framework where project complexity dimensions (Technological, Organizational and Environmental) are conceptualized. This model has been successfully cited in several other studies (Kimaru, 2019; Gautam & Kiridena, 2019; Bosch-Rekveldt, Bakker & Hertogh, 2018; Saed, Yong & Othman, 2016). Technological complexity is defined in terms of in terms of differentiation and interdependencies where technological complexity by differentiation refers to the variety and diversity of some aspects of a task such as number and diversity of inputs/outputs, number and diversity of tasks to undertake, and number of specialties and contractors, involved in the project (San Cristóbal, Carral, Diaz, Fraguela & Iglesias, 2018).Technological complexity by interdependency encompasses interdependencies between tasks, within a network of tasks, between teams, between different technologies, and between inputs(San Cristóbal, *et al*., 2018).

According to Kimaru (2019) organizational complexity is described in relation to project size (in terms of capital, budget, effort, duration, number of stakeholders or technical components needed for project), project drive and the softer elements such as project team composition, resources availability, skills, experience, and trust while environmental complexity includes the factors such as organizational internal support, dependencies on other stakeholders, variety in stakeholders' perspective etc. Technological complexity indicators under consideration for this study are experience with technology, clarity of goals and the number of tasks also successfully adopted by (Kimaru, 2019) in line with Bosch-rekveldt *et al.* (2011) studies. This study conceptualizes resources and skills

availability as the key attributes of organizational complexity while dependencies on the other stakeholders is the main attribute of environmental complexity.

Regarding the above reviews with no consensus on definition of project complexity, this study will adopt TOE framework by Bosch-rekveldt *et al.* (2011) also used by Kimaru (2019). According to San Cristóbal, Carra, Diaz, Fraguela and Iglesias (2018) how complexity is perceived and interpreted by project managers may result in different types of project complexity. Literature has shown different perspective and classification of project complexity, and there is a common agreement on confirmed complexity dimensions particularly organizational and technological complexity (Ghaleb & Abdullah, 2021) However, in this study, the dimensions of project complexity is chosen in the theoretical framework from existing research work by Bosch-rekveldt *et al.* (2011) in TOE framework. The study will try to establish whether they are usable tools to manage complexity in public primary schools undertaking projects. This study also aims at linking project complexity to project management practices and project success since the tenets of project complexity affect both project management practices (communication management, project risk management, project stakeholder management, project scope management) and project success therefore add value to existing literature on this subject.

2.4 Empirical Review

2.4.1 Communication Management and Project Success

Fraz *et al*. (2016) studies on effect of project management practices on project success in make-to-order manufacturing organizations employed use of questionnaire to collect data found out that communications management is significantly correlated with Project Success. The study involved checking for normality, correlation, and multiple regression analysis to find the association between variables. T-test was finally performed to find the difference between the extents to which project management practices influence project success. Communication with the project team and clients was found to be an important

factor for project success. The authors note that communication is one of the people competencies that is being done well by the successful project managers. The moderate correlation shown by communications management with project success in make to order manufacturing organizations is in commensuration with previous researches and validates the hypothesis that communications management is related to project success in make to order manufacturing organizations. The research made a general finding which does not show the importance of communication in project success. This research will bridge the gap by assigning the extent to which communication affects project success.

Mavuso and Agumba (2016) proposed a communication management conceptual model in support of the a number of hypothesis following an extensive review of literature (Perumal & Bakar, 2011;Culo & Skendrovic, 2010; Aiyewalehinmi, 2013;Kleim 2008;Kleim, Gouder, 2010 & Meid, 2015).The findings reveal that technology and systems have a positive influence on project success; communication skills or competence has a positive influence on project success; a communication plan has a positive influence on the success of the project; collaboration and teamwork have a positive influence on project success; organizational structure has a positive influence on project success; stakeholder's frame of reference has a positive influence on project success; project briefing has a positive influence on project success and context of an environment has a positive influence on project success.

2.4.2 Risk Management and Project Success

According to studies conducted by Musinya (2011) on the influence of project management practices on organizational performance, the findings reveal that risk management practice was very important for any construction company as this was represented by majority of respondents (84.4%) who admitted to practicing risk management procedures. Costs escalations reduced greatly, and organization performance and growth were found to be enhanced due to implementing technical support and effective control planning to prevent risk. The above findings concur with Raz *et al.* (1999) and Wasim-Ullah (2009) who advocates for the use of risk managing practices to

enhance project performance hence success. The study adopted a descriptive survey involving samples from construction companies in Westland District, Nairobi County. The study involved simple random sampling to sample 30 companies out of 33 Companies in Westland District to ensure that each Company got an equal chance of being selected.

According to Didraga (2013) there is limited empirical evidence that current risk management practices contribute to success in IT projects. Furthermore, the authors observe that from a review of the literature, the assumptions on which risk management in project management methodology is based, are often incorrect for IT projects. In a study investigating the role and the effects of risk management in IT projects success, the author argues that the methods and techniques used for risk analysis and risk response monitoring and control are the only processes that influence the subjective performance of the IT project. The study concluded that risk identification and planning did not influence the subjective performance of the project in terms of reliability, easiness, flexibility, satisfaction, and quality. Pearson correlation tests was used to test the correlation between applying risk management processes (risk identification, risk analysis, risk response planning, risk response monitoring and control) and the performance of the IT project. The study adopted analysis of literature related to risk management in IT projects from 1978 to 2012 in several publications and journals and online questionnaire.

Hartono, Wijaya and Arini (2019) assert that based on empirical evidence; risk management planning has a positive impact on the ability to predict the project duration. According to De Bakkar *et al.* (2010) various authors e.g., Rommel and Gutierrez (2012), found out that based on statistical evidence risk factors have a negative influence on project success. De Bakkar *et al.* further noted from review of the findings of Han and Huang (2007), which focused on risk dimensions and their impact on project success in IT projects, the risk dimension ‘requirements” has a strong negative impact on project success in IT trajectories.

De Bakkar *et al.* (2010) noted that there were two approaches to risk management: the evaluation approach and management approach. The evaluation approach provides us

with new and valuable insights into the risk factors that have an impact on IT project success. These authors note that there are both technical risk factors and organizational risk factors, such as senior management support and user participation, which were found to be highly influential based on extensive empirical research. These authors point out that the contribution of the evaluation approach to project success remains unclear and that the knowledge of the risks alone is not enough to contribute to project success. They also posit that management approach to risk management has not led to conclusive evidence either with the empirical knowledge still anecdotal and largely based on how risk management is assumed to work instead of how it is used in project practice.

In other study by Pimchangthong and Boonjing (2017) on effects of risk management practices on information technology (IT) project success, the findings demonstrate that risk identification had the highest positive influence on product performance, followed closely by risk response, while risk analysis negatively influenced product performance. Data was collected from 200 project managers, IT managers, and IT analysts in IT firms through questionnaires and analyzed through Independent Sample t-test, One-way ANOVA, and Multiple Linear Regression. The results showed that the differences in organizational types affected IT project success in all aspects, while the differences on organizational sizes also affected IT project success in the aspect of product performance and total aspects. The multiple linear regression analysis results showed that risk identification and risk response planning influenced IT project success. The results also indicated that risk identification had the greatest influence on predicting product performance, followed closely by risk response planning and risk analysis.

Sabir, Adeen, Muhammad, Mohd, Farooq, and Naila (2020) analyzed the impact of risk management on project success with the moderating role of managerial competency. The study adopted a quantitative and deductive approach to check the cause-and-effect relationship among variables. Sekaran (2003) used to estimate the sample size and convenience sampling method used to collect data using questionnaires. A 5-point Likert scale was used to assess risk management. The empirical findings demonstrated that that

risk management is positively correlated with project success and the relationship between risk management and project success is positively moderated by managerial competence.

Allen, Carpenter, Hutchins, and Jones (2015) investigated the impact of effective risk management processes on project success. In this research, two case studies of already executed projects were considered to analyze the impact of their risk management processes on the project outcome. Project 'A' had no visible risk management process implemented therefore all the risks identified at the definition stage occurred during the project execution. Project 'B' on the other hand, had some risk management processes implemented but the project still overran the schedule due to lack of continuity in the risk management. Both projects incurred huge amounts of lost earnings for the organizations due to their schedule overrun. It was concluded that the cause of these projects failures was attributed to the extent of risk management undertaken. The findings also reveal that the level of risk management process undertaken during a project, impacts directly on the success or otherwise of the project. Furthermore, effective risk management should be continuously undertaken throughout the project lifecycle to enhance project success.

Al-Shibly, Louzi, and Hiassat (2013) studied the impact of risk management on construction projects success. The results of the study indicated that there was a relationship between risk identification and project success and risk assessment and project success, scheduled time, planned budget, and the ability to comply with technical specifications. However, the findings reveal no impact of risk assessment on avoiding lawsuits or insurance claims. Also, the study indicated that there was an impact of risk response on project success, meeting the scope of work, scheduled time, and achieving the quality standards.

Bodicha (2015) sought to establish the effect of project risk management process on the success of construction projects. The study empirically reviewed literature on the theoretical framework of project risk management processes and its relationship to project success in construction industry. The study found out that risk factors have significant impact on the success of constructions project success regardless of the type or complexity

of the project. This means that the traditional success factors of cost, scope, time, and quality are universally inherent in all construction projects and should always be considered as a base for all other forms of critical success factors. However, project success is not guaranteed since the main weakness of project success is not from the traditional success factors but rather the society that is pressurizing project managers to succeed in all tasks. Therefore, critical success factors are necessities aimed at supporting projects managers in tracking various risk factors associated with projects and make an informed decision.

2.4.3 Stakeholder Management and Project Success

Chandr, Wiguna and Koming (2012) conducted involving use of questionnaire to evaluate the influence of stakeholder on project success using five- point Likert scale and face to face interviews. The role of stakeholders on project success constituted of stakeholder impact, stakeholder engagement, and stakeholder psychological empowerment while projects success was measured by cost performance, time performance, quality performance, profitability, and customer satisfaction. A questionnaire survey was designed for respondents to assess the performance of a project they had participated in and to evaluate the influence of stakeholder on project success. The data obtained was analyzed using structural equation modeling. The finding confirmed that stakeholder psychological empowerment is an essential factor in the delivery of project success. All the latent variables including stakeholder impact, stakeholder engagement, and stakeholder psychological empowerment were found to be significant. This result concurred with previous findings that indicated empowerment can be considered to reach successful relationship management process.

Moulid, Muchelule, and Wechuli (2021) investigated the influence of Stakeholders Management on the performance of Coast Development Authority (CDA) projects in Kenya. The study employed a descriptive research design targeting a population of 171 key project technical members from seven CDA projects involving project managers, project team leaders, project officers and key beneficiaries' representative as the

stakeholders. Yamane's formula was used to get the sample size followed by purposive and simple random sampling. Quantitative data were analyzed using correlation and regression analysis to assess relationships between the variables. Test of the hypothesis was done at a 95% confidence interval. The study demonstrated that resource mobilization, stakeholder planning, stakeholder communication, and stakeholder monitoring have a positive and significant effect on the performance of Coast Development Authority projects in Kenya.

According to Fraz *et al.* (2016) studies on effect of stakeholder management on project success in make-to-order manufacturing organizations which employed use of questionnaire to collect data, found out that stakeholder management as one of the project managements practices knowledge areas under the study was significantly correlated with Project Success. The study involved checking for normality, correlation, and multiple regression analysis to find the association between variables. T-test was also performed to examine the difference between two group means of stakeholder management practices in public and private sector organizations. The results indicate no significant differences in stakeholder management practices in both sectors implying the stakeholder management practices which cut across both private and public sector are similar.

In a study carried out in Zambia, Lusaka by Mambwe, Mwanaumo, Nsefu, and Sakala (2020) to assess the relationships between stakeholder engagement and the three performance (project success factors) parameters namely, project cost, project schedule and project specifications. The results demonstrated that stakeholder's engagement was strongly but negatively correlated to project cost while stakeholder engagement was strongly and positively correlated to project schedule and project specifications. The study employed descriptive research design in which involved using a self-administered questionnaire with a 5-point Likert scale. The study followed a quantitative methodology involving both primary and secondary data. Slovens's Formula was used to calculate the sample size followed by Stratified random sampling. The regression analysis was used to assess relationships between the independent and dependent variable.

In this regard and based on the review of previous studies on project stakeholder's management, this study will seek to confirm whether stakeholders strongly influence project success, given that most of the studies reviewed look at projects with relatively simple relationships yet most projects in the real world, have complex and nonlinear relationships. Previous studies also indicate a bias towards stakeholder identification and prioritization, rather than how it is related to project success factors, which this study intends to fill the gap. The outcome will add value to existing literature, particularly for projects with heterogeneous stakeholders involved in the project like the case of DLP.

2.4.4 Scope Management and Project Success

Ogunberu, Akintelu and Olaposi (2018) in a study to examine the application of project scope management practices on project success employed in the implementation of Information and Communication Technology (ICT) projects found out that the major project scope management success criteria were customers satisfaction, customers expectation, project costing, project quality and project duration respectively as confirmed by mean and standard deviation. The study employed use of questionnaire to collect primary data analyzed using both descriptive and inferential statistics. Regression results revealed that out of the six (6) indicators only four indicators used had significant impact on project successes in the selected firms at 0.05 level of significance, and these were customer expectations, customers satisfaction, resource allocation, and project duration. Two (2) variables that had no significance were project costing, and project quality. The study concluded that the project success criteria of the firms were generally satisfactory and very satisfactory with the implementation of project scope management practices.

Mbutu, Ngugi and Ombui (2022) conducted a study on the relationship between project scope definition and performance of government construction projects in Kenya, pegged on the theory of constraints. The unit of analysis was the construction projects with unit of observation being the construction project managers. The study adopted a combination of cross-section design and descriptive design, with primary data was collected using a semi-structured questionnaire and analyzed using both descriptive and inferential

statistics. The study demonstrated that scope definition was a positive and significant correlated to project performance.

In a study to explore scope management strategies used by some project leaders in the engineering field to improve project success rates, Ramage (2018) asserts that it is common for researchers conducting a qualitative research study to collect data from documents or archived records to validate the data collected from primary sources. Ramage used document review as a data collection instrument by reviewing company documents, such as budget reports, project completion reports, scope management implementation documents, and company records regarding project success rates. He also used semi structured interviews with 3 purposefully selected project leaders collect primary data. The results indicated scope management strategies implementation with all stakeholders are essential for enhancing success rates of engineering products.

Fraz *et al.* (2016) survey on the effect of scope management on project success employing the use of questionnaire to collect data, revealed that scope management is significantly correlated with project success. The results were consistent with studies conducted by Aborhor and Baiden (2021) and Kim and Ryu (2019). The study concluded that project success was related to scope management in Make-to-Order Organizations with the hypothesis being accepted. Failure to manage scope appropriately of the project would result in a higher chance of the project being deemed unsatisfactory among stakeholders and even lead to cancellation of the project given the cost, time, and quality implications likely to arise.

Another study by Nibyiza *et al.* (2015) to find out the impact of project scope change on the success of the projects in Rwanda, findings reveal that when managing a project there are times when project implementers will have to make decision to change the project scope to be able to meet the project objectives. This study adopted a descriptive research design, census sampling technique. Primary data was collected using interview and questionnaire and secondary data was obtained by review published materials. The findings of this research indicated that changing the project scope affected the project

product positively. The research found out that changes in project activities provoke the changes in project cost, time, and quality of the product/service of the project. The study indicated that when activities are changed without changing project cost or time and new activities are many; this leads to project delivery delays as well risk of not having enough resources to allocate to those added activities require additional resources not planned for initially.

According to Mirza *et al.* (2013) who analyzed the significance of scope in project success through literature review, one of the leading causes of project failure judging by the numbers of published studies in project management practices, is the lack of understanding or defining project scope at the start of the project. Unfortunately, there is limited research published on significance of project scope management on project success. In this regard, this study purposes to contribute to the literature available on project scope management while depicting its relationship to project success linking it to project complexity.

2.5 Critique of the Existing Literature

Extant literature indicates that the concept of project success and critical success factors had been extensively covered with most authors in agreement that operational excellence (time, cost, quality) and product success are key criteria for measuring the success of a project (Wahaj *et al*., 2017; Luo & Yin, 2014;). However, there was limited studies on contextual factors that moderate the relationship between critical success factors and project success. For instance, the moderating effect of project complexity on the correlation between project success factors and management of communication, risk, stakeholders, and scope is still unclear in the project management field.

Concerning project scope and project success, most reviewed studies have used scope as a measure of project success. This leaves a significant gap with respect to determining the relationship between scope management and project success. Nibyiza et al. (2015) assert that when managing a project there are times when project implementers will have to make

decision to change the project scope to be able to meet the project objectives. The major weakness of the study was data the definition of project scope was broad, and the scope measurement was ambiguous.

Alberto, Manuel, and Andrés (2016) based on a questionnaire given to construction industry professionals in Spain, the degree of importance of each factor is calculated and, finally, a structural equation model is proposed, in which it is confirmed that projects scope management decisively influences organizations sustained success. Despite the study utilizing structural equation model to develop a framework on the influence of scope management on project success, lack of moderating or mediating variables failed to bring out the direct or indirect influence of project scope management on project success.

Maame (2012) established that poor communication had resulted in project delays, project cost overrun and project abandonment. Project communications was also shown to strongly affect the performance of professionals within the construction industry. The study was based only in construction industry in Ghana, and it did not factor in project success. Furthermore, reviewed literature established that project risk management influenced project outcome in various ways. Musinya (2011) found that risk management practice was very important for any construction company as this was represented by majority of respondents (84.4%) who admitted to practicing risk management procedures. The study was purely descriptive in the analysis of data which makes it difficult to infer results.

With reference to project risk management, Roque, and Marly (2013) found out that there was a positive impact from the presence of a risk manager on project success using a survey of 415 projects at different levels of complexity in different industrial sectors in several states of Brazil. The main shortcoming of the study was methodological choice of non-probability sampling (convenience sampling) and a questionnaire based on perception of respondents. Njagi, Mbabazi and Kibachia (2016) found that incompetent project team members who did not understand project risk management process affected effective risk management in public housing construction projects in Rwanda. The study

evaluated factors affecting effectiveness of risk management and did not assess the relationship between project risk management practices and project success.

A review of the literature reveals the need for empirical research to explore the relationship between project management practices and project success moderated by project complexity. Some studies have shown there is a positive relationship between project complexity dimensions and certain project management practices and their combined effect on project performance hence project success. However, discerning exactly how adoption of project management practices and project success vary with project complexity is still in need of more empirical research which this study intends to address.

2.6 Research Gaps

Project communication is positively associated with project success in most of the reviewed studies. Extant literature reveals focus on dimensions of communication that influence project success where some dimensions of communication influenced project success positively and few dimensions influenced communication negatively (Majeed, 2020; Antony & Gupta, 2018; Yap, *et al.*, 2017). There is limited literature over the identification of the moderating role of project complexity on the relationship between communication and project success. Additionally, the literature does not contain consistent research results pertaining to the correlation between project complexity dimensions and project success.

Concerning project scope and project success, most reviewed studies have used scope as a measure of project success. This leaves a significant gap with respect to determine the relationship between scope management and project success. Nibyiza *et al.* (2015) assert that when managing a project there are times when project implementers will have to make decision to change the project scope to be able to meet the project objectives. The major weakness of the study was data the definition of project scope was broad, and the scope measurement was ambiguous. Alberto, Manuel, and Andrés (2016) based on a

questionnaire given to construction industry professionals in Spain, the degree of importance of each factor is calculated and, finally, a structural equation model is proposed, in which it is confirmed that projects scope management decisively influences organizations sustained success. Despite the study utilizing structural equation model to develop a framework on the influence of scope management on project success, lack of moderating variables failed to bring out the direct or indirect influence of project scope management on project success.

Empirical evidence on the moderating role of project complexity on the relationship between project success and risk management practices, and stakeholder management practices is lacking, with most studies evaluating the direct relationship between management of communication, risk, and stakeholders with project performance or success criteria (Majeed, 2020; Antony & Gupta, 2018; Yap, *et al.,* 2017; De Bakkar *et al.,* 2010; Didraga, 2013; Roque & Marly, 2013; Maina *et al.,* 2016; Perumal & Bakar, 2011; Culo & Skendrovic, 2010; Aiyewalehinmi, 2013.) Hayes and Rockwood (2017) opine the effect of independent variable is usually moderated or mediated by other variables in the environment and it's important to control it when carrying out scientific analysis. Moreover, the reviewed studies indicate there is a significant knowledge gap on the understanding of the relationship between project management practices as undertaken by the government of Kenya through various stakeholders and project success criteria.

2.7 Summary of the Reviewed Literature

The growing body of literature has examined the influence of project management practices on project success. Various theories have been examined in relation to study objectives to give a theoretical perspective in the development of study and finally discussion of the findings. The theories included theory of constraints which incorporates five progressive steps for improving the current situation namely, identifying system constraints; deciding on how exploit the identified constraints; subordinating everything else to the above decision; elevating the system constraints; and if in any previous steps a constraint has been broken, go back to the first step, and do not allow inertia to cause a

system constraint. Other theories relevant to this study were stakeholder theory for project stakeholder management and complexity theory for project communication planning and project communication management and risk management theory covering for project risk management.

The variables of study are operationalized through detailed review of relevant empirical literature relating to the statement of the problem and objectives of the study. Empirical studies are used to test the theories and therefore the study critiques the relevant existing literatures with aim of exposing the gaps which the current study will be seeking to fill or add value to. In particular, the study reviewed the conceptual and empirical studies on key project management practices mostly studied in project management literature, which are project communication management, project risk management, project stakeholder management, project scope management, project complexity and project success.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research design, population, sampling frame, sample size determination, sampling techniques, data collection techniques, pilot testing, processing, and analysis methods.

3.2 Research Design

A research design is a blueprint that guides the process of research from the formulation of the research questions and hypotheses to reporting the research findings (Sekaran & Bougie, 2011). It entails the use of various methods and techniques to conduct research so that a research question can be handled efficiently (Cresswell, 2014). A research design provides a framework for the collection and analysis of data (Bryman & Bell, 2011). The study adopted a descriptive survey research design which allows qualitative and quantitative research approach to be used. Descriptive survey design entails use of questionnaires for purposes such as describing, comparing, and correlating (Koh & Owen, 2000). The design was considered appropriate to give descriptive statistics as well as for inferential statistics. Descriptive design helps the researcher to identify patterns of association among the variables to confirm the overall interpretation of the relationships between the study variables (Sabana, 2014). The choice of descriptive survey design was informed by the need to gather quantitative data that describes the nature and characteristics of project management practices within public primary schools in Western Kenya. Given the flexible nature of descriptive design, triangulation from multiple qualitative data sources such as documents, artifacts and observation are often employed to offer more insight into the study problem. Sekaran and Bougie (2013) add that this design helps one to understand the characteristics of a group in each situation and assists in systematic thinking about aspects of a given situation.

According to Saunders, Lewis, and Thornhill (2014) all research is based on some underlying philosophy which informs choice of research design. This study was premised on positivism philosophy. A research philosophy relates to the foundation of knowledge upon which important assumptions and predispositions of a study are based (Hughes & Sharrock, 2016). Positivist philosophy premises that knowledge is based on facts and that no abstractions or subjective status of individuals is considered. Positivism thus derives a quantitative perspective which holds that there is an objective reality that can be expressed numerically, with explanatory and predictive power (Abbott & McKinney, 2013). Under this paradigm, knowledge is valid only if it is based on values of reason and facts, gathered through direct observations and experience measured empirically through quantitative methods and statistical analysis. Secondly, theoretical models can be developed that are generalizable to explain cause and effect relationships (Saunders, Lewis & Thornbill, 2014). Consequently, problem solving under this approach follows a pattern of formulating hypotheses in which assumptions of social reality are made and hypotheses tested often using quantitative techniques (Stile, 2003). Thus, the philosophical foundation of the study was positivism where scientific processes was followed in hypothesizing fundamental laws then deducing the observations to determine the truth or falsify the solid hypotheses.

3.4 Target Population

A population is a well-defined or set of people, services, elements, events, group of things or households that are being investigated (Barreiro & Albandoz, 2011). Ragab and Arisha (2018) refer population to mean all items in any field of inquiry which is also known as the universe. The target population for this study was 4,337 public primary schools and 7 County Director of Educations for the respective counties in Western Kenya region namely Kakamega, Bungoma, Busia, Kisii, Kisumu, Migori and Vihiga. Western Kenya region stretches from the county of Kisii to the county of Busia: bordering Uganda and Tanzania. Therefore, the region guarantees large sample from the many public primary schools represented and so is the diversity of the schools. The period under review in the study was between 2013 and 2019 covering phase one of the project implementation plan

schedule roll out. The head teachers oversee school administration hence were targeted as the appropriate respondents for their schools for the following reasons. They charged with responsibility of implementing school Digital Literacy Programme. They oversee project management practices used in school projects. They determine the level and scope of project management practices deployed in the schools in consultation with the County Directors of Education to facilitate role out of government projects in schools. For these reasons, head teachers and the County Directors of Education can provide reliable information for the study. The target population is presented in Table 3.1.

Table 3.1: Target population

County	Number of Schools	Number of County Directors of Education	Number of Respondents
Kakamega	879	1	880
Bungoma	741	1	742
Busia	431	1	432
Vihiga	378	1	379
Kisumu	613	1	614
Kisii	696	1	697
Migori	599	1	600
Total	**4337**	**7**	**4344**

Source: Ministry of Education (2021).

3.5 Sampling frame

The sampling frame was obtained from the Ministry of Education (MOE, 2021). It comprised of a list of public primary schools, in seven counties of Western Kenya. The Sampling frame is an objective list of the population from which the researcher can select (Acharya, Prakash, Saxena & Nigam, 2013). A sampling frame is the list of elements from which the sample is drawn (West, 2016).

3.6 Sample Size and Sampling Technique

A sample is a proportion of the subjects of the study used to represent the whole population (Zou, Sunindijo & Dainty, 2014). In sampling, some elements are selected from the actual

population as a representation but should be large enough to detect a significant effect (Marais, 2012). The researcher used Krejcie and Morgan Table (1970) to determine the sample size. Using the table developed by Krejcie and Morgan (see appendix V), the sample size for a population size of 4,344 is 354. The sample distribution per county as provided below in Table 3.2

Table 3.2: Sample size

County	No of Respondents	Sample Size Formula	Sample Size
Kakamega	880	(880/4,344) *354	72
Bungoma	742	(742/4,344) *354	60
Busia	432	(432/4,344) *354	35
Vihiga	379	(379/4,344) *354	31
Kisumu	614	(614/4,344) *354	50
Kisii	697	(697/4,344) *354	57
Migori	600	(600/4,344) *354	49
Total	**4344**		**354**

Source: Ministry of Education (2021).

Sampling is a process of obtaining sample units and sampling frame, setting sampling procedures and determining the sample size for the study (Saunders *et al.*, 2003). A sampling technique is a specific process by which the entities of the sample have been selected (Otengo, 2017). The sample size is determined by; the objective of the study, importance of the inquiry, available data, usefulness of the study, what is credible and time and resources available for the study (Gentles, Charles, Ploeg & McKibbon, 2015). The researcher used stratified random sampling technique to identify the sample from each county. According to Sharma (2017) stratified random sampling is a method of sampling that involves the division of a population into smaller groups known as strata. Therefore, in this study, the researcher stratified the respondents into seven strata as shown in Table 3.2. From each stratum, the expected sample size in each county was obtained as indicated in Table 3.2. To get the required respondents, the researcher randomly selected the respondents from a list obtained from the Ministry of Education.

3.7 Research Instruments

Data collection instrument is a device used to collect data in an objective and a systematic manner. The research instruments for data collection in this study were by use of a self-administered questionnaire and Documents Analysis forms.

The self-administered questionnaire was used to collect quantitative data from sampled from the headteachers and County Directors of Education. The questionnaire was closed-ended to improve response rate since it takes less time to answer. Closed ended questions were useful for conducting parametric analysis to test the hypothesis under investigation in the study. The use of self-administered questionnaire to obtain quantitative research data for analysis was further validated from results from analysis of project management documents (Kinyanjui, 2014). Schwab (2005) defines questionnaires as a data gathering instruments that ask individuals to answer a set of questions or respondent to a set of statement. Parpala and Lindblom-Ylänne (2012) define a questionnaire as a document that consists of several questions printed or typed in a definite order on a form or set of forms. Kinyanjui (2014) further notes that structured questionnaires are regarded the most appropriate for large populations of respondents and when the nature of the information needed is detailed.

The first part explained the purpose of the research to respondents and part two of the questionnaire had items in a 5 point-Likert type scale format using scales of SD – Strongly Disagree; D – Disagree; U – Undecided; A – Agree; SA – Strongly Agree; Very Large Extent; Large Extent; Moderate Extent; Small Extent and Very Small Extent as recommended by Kinyanjui (2014). Section one in this part of the questionnaire was on information regarding project management practices which is the independent variable in the study. Section two sought information on project success factors and section three captured data on project complexity. Besides utilizing questionnaires, the study entailed an analysis of various documents (reports) from the selected schools to ascertain the level of usage and satisfaction regarding project management practices and success of Digital

Literacy Programme during the first phase of implementation covering the periods between 2013 and 2019.

The Document Analysis Forms (see appendix III) were used to collect qualitative data for purposes of examining data and interpreting to elicit meaning in order to support evidence drawn from analysis of the questionnaire. According to Bowen (2009) documents contain words and images that have been recorded without a researcher's intervention which may be used for systematic evaluation as part of a study. The documents may be minutes of meetings, brochures, maps, application forms, institution reports among others. As part of qualitative research, document analysis is expected to draw upon multiple sources of evidence seeking convergence through use of different data sources and methods. This study entailed public primary school infrastructural project records like Communication Management Plan, Monthly Status reports, Risk Register, Project Complexity Assessment and Management (PCAM) Reports, Scope Management Plan which were reviewed to obtain secondary data from which content analysis was performed. The sole purpose of these reviews was to ascertain whether these tools were available for in use in the various public primary schools in Kenya for the Digital Literacy Programme and whether there use/disuse can be linked to project outcomes hence validate the findings from the analysis of data gathered through the questionnaires (Muszyńska, 2018).

3.8 Data Collection Procedure

The study entailed the use self-administered questionnaires as a research instrument to collect data from the respondents by dropping them and picking completed questionnaires after one week. The researcher trained and hired the services of 4 research assistants to aid in primary data collection using questionnaires from headteachers and respective County Directors of Education. Based on rapport between the researcher, the schools' heads and some of the County Education Officers, the researcher was able to gather data on whether the infrastructural project reports were available and in use in the sampled public primary schools. Document analysis was performed to analyze qualitative data on communication management plans, monthly status reports, risk registers, stakeholder

identification forms and Project Complexity Assessment and Management (PCAM) reports, to help triangulate quantitative data.

3.8.1 Pilot Test

A pilot study was carried out to pre-test data collection instrument for validity and reliability. It was conducted to detect weakness in design and instrumentation and to provide accurate data for selection of a sample (Ahmad & Ahmad, 2018). Some of the weaknesses that pilot study sought to detect include poor introduction and instructions to questionnaire, unclear or undefined terms, unclear or ambiguous response task, and biased or offensive questions. According to Ahmad and Ahmad (2018), sample size of 10% of the sample population is a good representative for pilot study. Therefore, 35 respondents were involved in the pilot study in Uasin Gishu county and the return rate for the pilot study was 100%.

3.8.2 Validity

The validity of the questionnaires was determined using content validity. Kung'u (2015) asserts that content validity is the extent to which the measurement device provides adequate coverage of the investigative questions. Variable reduction tests were done which included both content and construct validity to ensure that unnecessary items in the questionnaire instrument were removed and those items that measure the intended purpose were retained (Almanasreh, Moles & Chen, 2019).

Content validity in the development of any new instrument, provides evidence about the validity of an instrument by assessing degree to which the instrument measures intended purpose (Almanasreh *et al.*, 2019). In this study, the research questionnaire was subjected to a team of four expert judges who included two supervisors to the researcher and other two professors who are experts' field of Digital Literacy Programme and Project Management. The four expert judges examined the thirty-nine items in the questionnaire to determine whether the research items were relevant to the subject of study and covered

the full scope of the measurement constructs. All the four expert judges were asked to independently rate the items and all the thirty-nine items were agreed and confirmed to have the relevant content and thus retained for the main study.

Construct validity is defined as the extent to which instruments used for data collection in the field measures the actual hypothesis of the study (Colliver, Conlee & Verhulst, 2012). Construct validity involved both Kaiser-Meyer-Olkin (KMO), Bartlett's tests, and factor analysis with Varimax rotation. KMO was used to measure sampling adequacy; that is, to ascertain if the number of items used to measure a particular construct (variable) were adequate; it ranges between 0 and 1 with value of 1 indicating perfect results, and a minimum threshold of 0.5 established as the better results *(*Colliver *et al.,* 2012*).* Bartlett's Test of Sphericity was used to test if the study items for each construct were coming from a population with equal variance. Principal component analysis was used to identify and compute composite scores for the factors underlying our 5-point Likert scale that were used in the study questionnaire. Varimax rotation provided the best-defined factor structure for all the study variables. Communalities were conducted to check if all the items within a common construct variable, shared a common variance that can be explained by the factors, and a value of 0.3 is considered as a minimum threshold (Shrestha, 2021).

3.8.3 Reliability

Reliability analysis was conducted using Cronbach's alpha to determine whether the data gathered on each variable has a significant relationship with project management practices. Reliability is the extent to which results are consistent over time and an accurate representation of the total population under study. If the results of a study can be reproduced under a similar methodology, then the research instrument is reliable (Bhatnagar, Kim & Many, 2014). In the pilot study, reliability test was conducted to assess whether the 5-point Likert scale used in the questionnaire to measure the study constructs (variables) was reliable (measures intended purpose). To achieve this, the study employed Cronbach's Alpha coefficient analysis assess how reliable this scale was; a coefficient of

0.7 was adopted as the minimum threshold for deciding on the sufficiency of the reliability of the study scale (Almanasreh *et al.,* 2019).

3.9 Data Processing and Analysis

The ungrouped data from the field was taken through several processes in preparation for analysis. These processes were, identifying and managing impossible values, and handling missing data. Impossible values are values that fall out of the expected range on a given scale of measurement (Perry, 2004). This was resolved by running descriptive analysis where frequencies through SPSS version 23 was carried out and the impossible values were rectified by tracing for the right values back in the questionnaires and replacing in the SPSS dataset. The final dataset was free of impossible values as indicated in the descriptive statistics findings. For the questions where there was no response, the values were well coded and uniquely identified in the SPSS datasets as missing values and pairwise deletion employed to deal with the missing data. Pairwise deletion makes assumption that data are missing completely at random, but all data cases (even those with missing data) are used in analysis hence allowing the researcher to use more of the data. However, the resulting statistics varied because they were based on different data sets hence the difference in sample size(N). Pairwise deletion maximizes all data available by analysis basis thereby increasing power in statistical analysis (Newman, 2014). Quantitative data was analyzed using both inferential and descriptive statistics. Inferential statistic such as Pearson correlation coefficients and multiple regression models were used.

Descriptive analysis involved determining the means, standard deviation, and averages of the responses. The questionnaire response was basically based on short closed ended questions which needed short responses on the Likert continuum scale [ranging from 1 to 5], where 1 was Strongly Agree, 2 Agree, 3 Undecided, 4 Disagree ,5 Strongly Disagree;1 Very Large Extent; 2 Large Extent; 3 Moderate Extent; 4 Small Extent and 5 Very Small Extent. Factor analysis based on principal components analysis with varimax rotation for specific items of both the dependent variables and independent variables was conducted

to describe variability among observed correlated variables in terms of a potentially lower number of unobserved questionnaire constructs. Multiple regression analysis was employed to test the study hypotheses by testing the statistical significance of the various independent variables (Communication management, Risk management, Stakeholder Management and Scope Management) on the dependent variables (Project Success).

According to O'Leary (2014), there are to major techniques of exploring the "witting" evidence, or the actual content of the documents. One is the interview technique. In this case, the researcher treats the document like a respondent or informant that provides the researcher with relevant information (O'Leary, 2014). The researcher "asks" questions then highlights the answer within the text. The other technique is noting occurrences, or content analysis, where the researcher quantifies the use of particular words, phrases and concepts (O'Leary, 2014). In this research, secondary data was obtained from public primary school infrastructure project documents such as the Communication Management Plan, Monthly Status Reports, Risk Register, Project Complexity Assessment and Management (PCAM) Reports, and Scope Management Plan. The main goal of these evaluations was to see whether these tools were accessible for usage in Kenya's different public primary schools for the Digital Literacy Program, and if their use/disuse could be related to project results, thereby validating the findings from the questionnaire data analysis hence triangulation. The purpose of triangulating is to provide a confluence of evidence that breeds credibility (Bowen, 2019). Corroborating findings across data sets can reduce the impact of potential bias by examining information collected through different methods.

To make inferences from the study data to more general conditions correlation and diagnostic tests were done first followed by hypothesis testing of each of the study construct items.

3.9.1 Correlation Analysis

Pearson Correlation analysis was used to determine the strength and direction of the relationship between independent variables and the dependent variable without the moderating variable and then compared to the results when moderating variable is included in order to find out the effect of moderating variable. The greater the correlation coefficient value, the stronger the relationship. According to Cohen, West and Aiken (2013) the correlation strengths can be interpreted using decision rules where correlation coefficients that equals zero indicate no linear relationship exists, 0.1 to 0.3 indicates weak correlation, 0.31 to 0.5 indicates moderate correlation strength, coefficients greater than 0.5 indicate a fairly strong correlation between the variables and correlation of 1 indicating perfect strong positive correlation. Diagnostic tests were performed to test to ensure the assumptions of Pearson correlation and linear regression hold.

3.9.2 Regression Analysis

Regression analysis is a constructive statistical technique that can be used to analyze the associations between a set of independent variables and a single dependent variable (Vis, 2012). According to Jackson (2009) as cited by Kariuki *et al*., (2015), multiple regression analysis involves combining several independent variables in a single regression equation. In our study, Multiple Regression analysis was used to examine how changes in the independent variables influenced changes in the dependent variable. Regression model fitness was estimated using coefficient of determination which helps explain how closely the predictor (independent) variable explains the variations in the dependent variable. T-test statistic was used to test the significance of each individual predictor and the p-value used to make conclusions on whether to reject or accept the null hypotheses. The level of significance of 5% was used as a benchmark. If the p- value is less than 0.05 at 5% significance level, we rejected the null hypotheses and accepted the alternative and vice versa (Linyuru *et al.,* 2015). In our study we applied both Standard Multiple Regression and Moderated Multiple Regression models.

To test individual null hypothesis, the study used the following regression model as per the five hypotheses.

H_{o1}: Communication Management has no significant influence on success of DLP in Kenya.

Project Success = *f* (Communication management+ random error)

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$

H_{o2}: Risk Management has no significant influence on success of DLP in Kenya.

Project Success = *f* (Risk management+ random error)

$Y = \beta_0 + \beta_2 X_2 + \varepsilon$

H_{o3}: Stakeholders Management has no significant influence on success of DLP in Kenya.

Project Success = *f* (Stakeholders management+ random error)

$Y = \beta_0 + \beta_3 X_3 + \varepsilon$

$H_{o4:}$ Scope Management has no significant influence on success of DLP in Kenya.

Project Success = *f* (Scope management+ random error)

$Y = \beta_0 + \beta_4 X_4 + \varepsilon$

H_{o5}: Project complexity has no significant influence on project success in the success of DLP in Kenya.

Project Success = *f* (project complexity+ random error)

$Y = \beta_0 + \beta_5 X_5 + \varepsilon$

Standard Multiple Regression model was used to measure the influence of Project Management Practices on Success of DLP in Kenya. To determine the structural relationship between Project Management Practices on Success of DLP (Project) in Kenya Projects, the following linear regression model was applied:

$$\mathbf{PS} = ß_o + ß_1\,\mathbf{SM} + ß_2\,\mathbf{CM} + ß_3\,\mathbf{RM} + ß_4\,\mathbf{STM} + \boldsymbol{\alpha}$$

Where;

PS = Project Success

SM = Project Scope Management

CM = Project Communication Management

RM = Project Risk Management

STM = Project Stakeholder Management

$ß_0, ß_1, ß_2, ß_3 ß_4$ = Unstandardized Beta coefficients

α = Level of significance (error term)

Moderated Multiple Linear Regression Model **(**also known as Hierarchical Multiple Regression Technique) was used to determine the moderation effect of Project Complexity on the relationship between the Project Management Practices and the Success of DLP (project) in Kenya. The model equation was given as:

$$\mathbf{PS} = ß_o + ß_1\,\mathbf{SM} + ß_2\,\mathbf{CM} + ß_3\,\mathbf{RM} + ß_4\,\mathbf{STM} + ß_5\,\mathbf{M} + ß_6\,\mathbf{IE} + \boldsymbol{\alpha}$$

Where;

PS = Project Success

SM = Project Scope Management

CM = Project Communication Management

RM = Project Risk Management

STM = Project Stakeholder Management

M = Moderator (Project Complexity)

IE = Interaction Effect

$ß_0$, $ß_1$, $ß_2$, $ß_3$, $ß_4$, $ß_5$, $ß_6$ = Unstandardized Beta coefficients

$\boldsymbol{\alpha}$ = Level of significance

Moderation effect exists if the interaction effect is significant in the model. If the moderation effect will be found to be significant, Interaction Plots will then be used to describe how the moderator (Project Complexity) moderates the relationship between the Project Management Practices and Success of DLP in Kenya.

3.9.3 Tests of Assumptions

Simple Linear Regression Model was adopted in this study to model the relationship between the Project Management Practices (Independent Variables) and the Success of DLP (Dependent Variable). The study dataset was testedfor purposes of inference or prediction, if it satisfied all the assumptions of this model which included: Normality, Linearity, Homoscedasticity, and presence of outliers. This is critical because scientific insights yielded by a regression model that has violated these assumptions may be at best, inefficient or at worst, seriously biased or misleading (Oteki, 2019).

Normality Test sought to assess whether the scores for the Independent Variable and Dependent Variable were normally distributed through use of Shapiro-Wilk test. The

results showed that for both variables all the p-values had a level of significance greater than 0.05. This indicated that the scores for all the variables were significantly normally distributed for all the constructs (Ghasemi & Zahediasl, 2012).

Linearity Tests were conducted by use of Normal probability plots to determine if the residuals are normally distributed. It was established from the findings that the residual points lie along a reasonably straight diagonal line from bottom left to top right for each study constructs, implying that the assumption the error terms are normally distributed holds (Heo *et al.,* 2008).

Test of Homoscedasticity refers to the assumption that the dependent variable exhibits similar amounts of variance across the range of values for an independent variable (Tharu, 2019). To test for this assumption the study adopted use of a Scatter plots. The results showed that the residuals were roughly rectangularly distributed, with most of the scores concentrated at the center, implying that the Homoscedasticity assumption holds.

According to Aggarwal (2017) an outlier is a data point that is significantly different from the remaining data and therefore has the potential to affect analysis results. *Outlier detection* refers to the problem of finding patterns in data that do not conform to expected normal behavior (Chandola, Banerjee & Kumar, 2007). For a normal distribution, outliers can be points that lie three (3) or more standard deviations from the mean (Knorr &Ng, 1997). If the outliers are included in the set used for estimation, inconsistent estimates of the parameters will be obtained and the existence and the effect of the outliers will be masked (Riani & Atkinson, 2004). According to Gravetter andWallnau (2000) outliers are defined as points that extend more than 1.5 box-lengths from the edge of the box plot (indicated with a small circle o) and extreme points (indicated with an asterisk * in a box plot) are those that extend more than 3 box-lengths from the edge of the box plot. Test for presence of outliers involved the use of box plot.

According to Mugenda and Mugenda (2012), multicollinearity exists in multiple regression models in which some of the predictor variables are significantly correlated

among themselves. It is a data problem which may cause serious difficulty with the reliability of the estimates of the model parameters (Alin, 2010), whereby the regression model fits the data well, but none of the explanatory variables has a significant influence in forecasting the dependent variable (Brien, 2007). The study adopted the use of Variance Inflation Factor (VIF) to detect any problem of collinearity. According to Brien (2007), its recommended that independent variables with VIF higher than 5 or a tolerance value less than 0.2 should be removed from the multiple linear regression model this indicates presence of multicollinearity.

3.9.5 Factor Analysis

Factor analysis is used to simplify complex sets of data by collapsing many variables into a few factors that can be interpreted having placed the variables into meaningful categories since, not all variable factors are statistically important in research (Kline, 2014). Factor analysis is useful for studies that involve a few or hundreds of variables, questionnaires items, which can be reduced to a smaller set, to get at an underlying concept enabling one to focus on some key factors rather than having to consider too many variables that may be trivial to facilitate interpretations (Yong & Pearce, 2013). Principal component analysis is used to identify and compute composite scores for factors underlying the 5-point Likert scale used in the study questionnaire and Varimax rotation used to provide the best-defined factor structure for all the study variables. Communalities (each variable's variance proportion that can be explained by the factors) is determined to check whether all the items within a common construct variable, shared a common variance that can be explained by the factors, and a factor loading value of at least 0.3 considered as the minimum threshold (Costello & Osborne ,2008). If the factor loading of items is above minimum threshold of 0.4, then the sample size of the items was deemed adequate to measure the study variable construct. To identify and remove hidden constructs or variable items that do not meet the objectives of the study, and which may not be apparent from direct analysis, the study conducted factor analysis where eigenvalues for each variable were extracted using principal component analysis (Ledesma & Valero-Mora, 2007; David *et al.,* 2010).

3.9.6 Study Hypothesis

The study hypotheses were analyzed and interpreted as presented in Table 3.3 below.

Table 3.3: Study Hypotheses

Objective	Hypothesis	Type of Analysis	Interpretation
i. To assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.	**H_{o1}:** There is no significant relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.	Pearson Correlation Linear Regression Analysis	If p-value < 0.05, Reject the null hypothesis
ii. To determine the relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.	**H_{o2}:** There is no significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.	Pearson Correlation Linear Regression Analysis	If p-value < 0.05, Reject the null hypothesis
iii. To examine the relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.	**H_{o3}:** There is no significant relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.	Pearson Correlation Linear Regression Analysis	If p-value < 0.05, Reject the null hypothesis
iv. To establish the relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.	**H_{o4}**: There is no significant relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.	Pearson Correlation Linear Regression Analysis	If p-value < 0.05, Reject the null hypothesis
v. To determine the moderating role of project complexity on the relationship between the project management practices and success factors of Digital Literacy Programme in Western Kenya.	**H_{o5}**: Project Complexity has no significant moderating effect on the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.	Pearson Correlation Hierarchical Regression Analysis	If p-value < 0.05, Reject the null hypothesis

3.9.4 Operationalization of Study Variables

Operationalization is the process of strictly defining variables into measurable factors. The process defines fuzzy concepts and allows them to be measured, empirically and

quantitatively (Uher, 2021). The operationalization of the study independent, dependent, and moderating variables is as presented below in **Table 3.4.**

Table 3.4: Operationalization of Study Variables

Variable type	Indicator	Measurement Scale	Adopted Source
(Independent Variable) Communication Management	Planning Implementation Monitoring	Ordinal scale (5-point Likert scale)	Fraz *et al*., 2016; Culo & Skendrovic, 2010)
(Independent Variable) Risk Management	Listing Risks Analysis of Risks Response Planning	Ordinal scale (5-point Likert scale)	Crispim, et *al.*, 2019; Pimchangthong & Boonjing, 2017)
(Independent Variable) Stakeholder Management	Engagement Empowerment Identification	Ordinal scale (5-point Likert scale)	Nguyen and Mohamed (2021)
(Independent Variable) Scope Management	Collecting requirements Validating Changes Controlling scope	Ordinal scale (5-point Likert scale)	Nath & Momin, (2014)
(Dependent Variable) Project Success	Within Timelines Quality Adherence On Budget	Ordinal scale (5-point Likert scale)	Akbar & Shahid (2023)
(Moderating Variable) Project Complexity	Experience with technology. Number of Tasks. Goal Clarity. Resource and skills availability. Size of project team. Dependencies on the other stakeholders.	Ordinal scale (5-point Likert scale)	Lu *et al.*, 2015; Kimaru, 2019)

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter focuses on presenting data analysis, findings, and interpretation. The section also consists of pilot results and diagnostic results. The analyzed data was arranged under themes that reflect the study objectives. Further, the section presents the optimal model showing the outcome of the study. The study employed statistical techniques both descriptive and inferential statistics to examine the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya. The study also explored the moderating role of project complexity on the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.

4.2 Response Rate

The researcher distributed 347 questionnaires to the headteachers at the public primary schools and one questionnaire to each County Director of Education in Kakamega, Bungoma, Busia, Kisumu, Migori, Kisii and Vihiga Counties. The Total number of questionnaires administered were 354.

Table 4.1: Response rate

County	Sample Size	Response	Return rate (%)
Kakamega	72	64	88.9
Bungoma	60	53	88.3
Busia	35	31	88.6
Vihiga	31	27	87.1
Kisumu	50	43	86.0
Kisii	57	49	86.0
Migori	49	41	83.7
Total	**354**	**308**	**87.0**

Out of the 354-questionnaire issued, 308 questionnaires were successfully filled and handed back to the researcher translating to a response rate of 87.0%. According to Baruch and Holtom (2008) a minimum average level of response rate of 52.7 percent is good; with any rates above 70% deemed to be excellent. Therefore, the response rate obtained for this study (87.0%) was adequate to draw conclusions.

4.3 Pilot Study Test Results

To make inferences from the study data to more general conditions, the study entailed inferential statistics. To carry out this exercise, the study established the reliability of variables under investigation, conducted sample adequacy test of the items used to construct the variables and sought factor analysis of these variables. Correlation and diagnostic tests were done first followed by hypothesis testing of each of the study construct items. Correlation analysis was conducted to determine the direction and the strength of the relationship between the predictor variable(s) and dependent variable.

4.3.1 Reliability of Variables

In this study, reliability tests were conducted to assess whether the five -point Likert scale used in the questionnaire to measure the study constructs (variables) was reliable (measures intended purpose). To achieve this, the study employed Cronbach's Alpha coefficient analysis assess how reliable this scale was; a coefficient of 0.7 was adopted as the minimum threshold for deciding on the sufficiency of the reliability of the study scale *(*Kendell & Jablensky, 2003*).* Results for reliability test were as presented in Table 4.2 below.

The results as indicated in Table 4.2, show that Cronbach alpha coefficients for all the variables were above the minimum threshold of 0.7 (Kendell & Jablensky, 2003); Project Success was 0.722; Communication Management was 0.758; Risk Management was 0.745; Stakeholder Management was 0.907; Scope Management was 0.812 and Project

Complexity was 0.781. Therefore, our study concluded that the 5-point scale of the items used to measure the study constructs was reliable and acceptable for further analysis.

Table 4.2: Reliability Test Results

Variables (Constructs)	Number of items	Cronbach Alpha
Project Success	4	0.722
Communication Management	7	0.758
Risk Management	8	0.745
Stakeholder Management	5	0.907
Scope Management	7	0.812
Project Complexity	8	0.781

4.3.2 Validity Test Results

In this study, the researcher tested for both construct and content validity during pilot testing to reduce unnecessary variables to ensure validity of the research instrument. Reliability of the 5-point Likert scale was assessed using coefficient alpha. The findings of the pilot study are as presented in the following subsections.

Sample Adequacy Test

To ascertain sampling adequacy of the items used in the constructs, Construct validity was performed which involved Kaiser-Meyer-Olkin (KMO), Bartlett's tests, and factor analysis with Varimax rotation. KMO was used to measure sampling adequacy; that is, to ascertain if the number of items used to measure a particular construct (variable) were adequate; it ranges between 0 and 1 with value of 1 indicating perfect results, and a minimum threshold of 0.5 established as the better results (Kendell & Jablensky, 2003).Bartlett's Test of Sphericity was used to test if the study items for each construct were coming from a population with equal variance. Principal component analysis was used to identify and compute composite scores for the factors underlying our 5-point Likert scale that were used in the study questionnaire. Varimax rotation provided the best-defined factor structure for all the study variables. Communalities were conducted to

check if all the items within a common construct variable, shared a common variance that can be explained by the factors, and a value of 0.3 was considered as a minimum threshold (Costello & Osborne, 2008). The study results for construct validity were as presented in Table 4.3.

Table 4.3: Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity Results

Variable	Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	Bartlett's Test of Sphericity		
		Approx. Chi-Square	Degrees of freedom	p-value
i. Project Success	0.622	107.880	6	0.000
ii. Communication Management	0.837	1049.531	21	0.000
iii. Risk Management	0.619	809.534	28	0.000
iv. Stakeholder Management	0.810	1067.486	10	0.000
v. Scope Management	0.738	2372.924	45	0.000
vi. Project Complexity	0.779	380.732	28	0.000

Findings as indicated in Table 4.3, shows that the value of KMO for all the variables (constructs) were above a minimum threshold of 0.5; Project Success = 0.622, Communication Management= 0.837, Risk Management = 0.619, Stakeholder Management = 0.810, Scope of Management = 0.738 and Project Complexity = 0.779. This indicates that the number of items for each construct (variable) were adequate to measure the respective variables. The Chi-square test results for Bartlett's Test of Sphericity were all found to be significant; [χ^2 (6) =107.880, $p=0.000 < 0.05$] for Project Success, [χ^2 (21) = 1049.531, $p=0.000 < 0.05$] for Communication Management, [χ^2 (28) = 809.534, $p=0.000 < 0.05$] for Risk Management, [χ^2 (10) = 1067.486, $p=0.000 < 0.05$] for Stakeholder Management, [χ^2 (45) = 2372.924, $p=0.000 < 0.05$] for Scope of Management and [χ^2 (28) = 380.732, $p=0.000 < 0.05$] for Project Complexity; this indicated that the sampled items for each variable were from a population with equal variance.

Factor Analysis of Variables

Factor loadings and communalities based on Principle Component Analysis with Varimax rotation for 4 items was applied to determine Success Factors of Digital Literacy Programme construct validity. The results were as presented in Table 4.4.

Table 4.4: Factor Analysis for Success Factors

	Statement	Factor Loading	Communalities	Decision
i.	Project completed within planned budget contributes to project success.	.543	.495	Retained
ii.	It is important to achieve the quality standards mentioned in the specifications for a successful project.	.732	.536	Retained
iii.	Project is successful if completed within proposed timelines.	.769	.592	Retained
iv.	It is important to comply with technical specifications for project success.	.556	.409	Retained

From the results as indicated in Table 4.4 above, the communalities for all the five items under Success Factors were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the five items shared a common variance. Factor loadings for all the five items under Project Success (success factors) were above a minimum threshold of 0.4 (see Table 4.4); an indication that sample size of the five items was adequate to measure Project Success construct.

Factor loadings and communalities based on a principal component's analysis with Varimax rotation for 7 items was conducted to provide best-defined factor structure for the Communication Management construct. The findings were as presented in Table 4.5, which indicated that communalities for all the nine items under Communication Management were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the nine items shared a common variance. Factor loadings for all the nine items under Communication Management were above a minimum threshold of 0.4

(see Table 4.5); an indication that sample size of the nine items was adequate to measure Communication Management construct.

Table 4.5: Factor Analysis for Communication Management

Statement	Factor Loading	Communalities	Decision
i. All communications with stakeholders as regard to the project are done in a timely manner	.725	.550	Retained
ii. A selected person for the project clearly understands the project objectives, benefits, and risks.	.837	.710	Retained
iii. The project manager uses a variety of communication methods to share information among stakeholders such as emails, notes, letters, face to face engagement	.873	.769	Retained
iv. A failure in communication can have a negative impact on the project	.911	.836	Retained
v. There are official standardized methods to guide communication among the project team members	.914	.844	Retained
vi. All project team members sign off minutes of meetings held noting all deliberations discussed	.788	.630	Retained
vii. Project team members have a feedback mechanism for all communication done.	.575	.477	Retained

Factor Analysis for Risk Management based on a principal components' analysis with Varimax rotation for 8 items. The findings were as shown below in Table 4.6.

Table 4.6: Factor Analysis for Risk Management

Statement	Factor Loading	Communalities	Decision
i. We have a risk breakdown structure that we normally use to identify potential risk for mitigation.	.954	.912	Retained
ii. Workshops are normally organized for risk evaluation to determine high-impact risks, which can help narrow the focus on a few critical risks that require mitigation.	.894	.819	Retained
iii. After the risk has been identified and evaluated, the project team develops a risk mitigation plan to reduce the impact of an unexpected event.	.712	.543	Retained
iv. The project team often develops an alternative method for accomplishing a project goal when a risk event has been identified that may frustrate the accomplishment of that goal.	.801	.697	Retained
v. The project team always considers potential risk in the planning phase and weight against the potential benefit of the project's success in order to decide if the project should be chosen.	.752	.567	Retained
vi. Once the project is approved and it moves into the planning stage, risks are identified with each major group of activities to identify increasing levels of detailed risk analysis.	.841	.763	Retained
vii. In the project implementation phase of the projects, risk plan is always updated with new information and risks checked off that are related to activities that have been performed.	.669	.658	Retained
viii. During the closeout phase of the projects, agreements for risk sharing and risk transfer is always concluded, and the risk breakdown structure examined to be sure all the risk events have been avoided or mitigated.	.773	.659	Retained

Table 4.6 presenting the results, shows that communalities for all the eight items under Risk Management were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the eight items shared a common variance. Factor loadings for all the eight items under Risk Management were above a minimum threshold of 0.4 (see Table 4.6); an indication that sample size of the eight items was adequate to measure Risk Management construct.

Factor loadings and communalities based on a principal components' analysis with Varimax rotation for 5 items was conducted to provide best-defined factor structure for Stakeholder Management construct. The findings were as shown in Table 4.7

Table 4.7: Factor Analysis for Stakeholder Management

Statement	Factor Loading	Communalities	Decision
i. People selected as stakeholders benefit from projects initiated.	.874	.764	Retained
ii. The project team members are selected at a point that they have the greatest impact on the project.	.838	.702	Retained
iii. The project team or organization selected holds a position from which they can influence the project.	.842	.709	Retained
iv. People selected have requisite skills to handle the project and freely voice their concerns if need be before decision are made.	.841	.707	Retained
v. People selected as stakeholders had competing agendas which were not revealed at the start of the project.	.896	.803	Retained

The results captured in Table 4.7, shows that communalities for all the five items under Stakeholder Management were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the five items shared a common variance. Factor loadings for all the five items under Stakeholder Management were above a minimum threshold of 0.4 (see Table 4.7); an indication that sample size of the five items was adequate to measure Stakeholder Management construct.

Factor Analysis for Scope Management based on a principal components' analysis with Varimax rotation for 10 items was conducted and the findings were as shown in Table 4.8.

Table 4.8: Factor Analysis for Scope Management

Statement	Factor Loading	Communalities	Decision
i. All the project activities identified are known from the onset of the project	.918	.846	Retained
ii. Change in project activities results to change in Project outcome quality	.667	.451	Retained
iii. In case there is need to change the project scope, a scope change request form is filled, analyzed, reviewed, and approved by stakeholders	.824	.679	Retained
iv. Changes in project activities resulted to change in Project cost	.618	.451	Retained
v. Changes in project activities resulted to change in Project schedule/time	.895	.841	Retained
vi. During scope planning all key stakeholders were involved.	.916	.881	Retained
vii. There is a clear way of tracking and measuring critical project achievements (milestones) as the project progresses in line with objectives at every stage of implementation.	.577	.333	Retained
viii. There were project team members who were experienced in scope planning.	.917	.844	Retained
ix. There was a scope management plan initiated before project execution.	.906	.828	Retained
x. There is a detailed scope statement which was availed to all the project stakeholders before the project was executed.	.744	.766	Retained

From the results (Table 4.8), communalities for all the ten items under Scope Management were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the ten items shared a common variance. Factor loadings for all the ten items under Scope Management were above a minimum threshold of 0.4 (see Table 4.8); an indication that sample size of the ten items was enough to measure Scope Management construct.

Factor loadings and communalities based on a principal component's analysis with Varimax rotation for 8 items was conducted to provide best-defined factor structure for the Project complexity construct. The findings were as presented in Table 4.9.

Table 4.9: Factor Analysis for Project Complexity

Statement	Factor Loading	Communalities	Decision
i. The planned project resources were in adequate to complete tasks	.154	.310	Retained
ii. Bottlenecks during execution of the project held up key processes hence delaying project activities	.681	.479	Retained
iii. There was sufficient technology which made management of the project easy and up to date.	.645	.426	Retained
iv. Processes or methods to achieve the project goals were unclear.	.761	.595	Retained
v. Key risks were not identified early enough and when triggered, were not managed productively.	.758	.585	Retained
vi. The project team members numbers were sufficient for this kind of a project	.537	.386	Retained
vii. Sub-activities and sub-tasks during execution of the project were diverse and highly unpredictable	-.503	.317	Retained
viii. Level of innovation within the project was unpredictable and required hiring external consultants	.899	.814	Retained

As per the results captured in Table 4.9, communalities for all the eight items under Project Complexity were all above the minimum threshold of 0.3 (Costello & Osborne, 2008); these indicated that the eight items shared a common variance. Factor loadings for all the eight items under Project Complexity were above a minimum threshold of 0.4 (see table 4.9); an indication that sample size of the eight items was adequate to measure Project Complexity construct.

4.4 Demographic Characteristics

Demographic characteristics in this study entailed the respondent's county, age and experience (years in service). The results in Figure 4.1 revealed that 20.8% respondents were from Kakamega County, 17.2% from Bungoma County, 15.9% from Kisii County, 14.0% from Kisumu County, 13.3% from Migori County, 10.1% from Busia County, and 8.8% from Vihiga County. The results are as presented in Figure 4.1

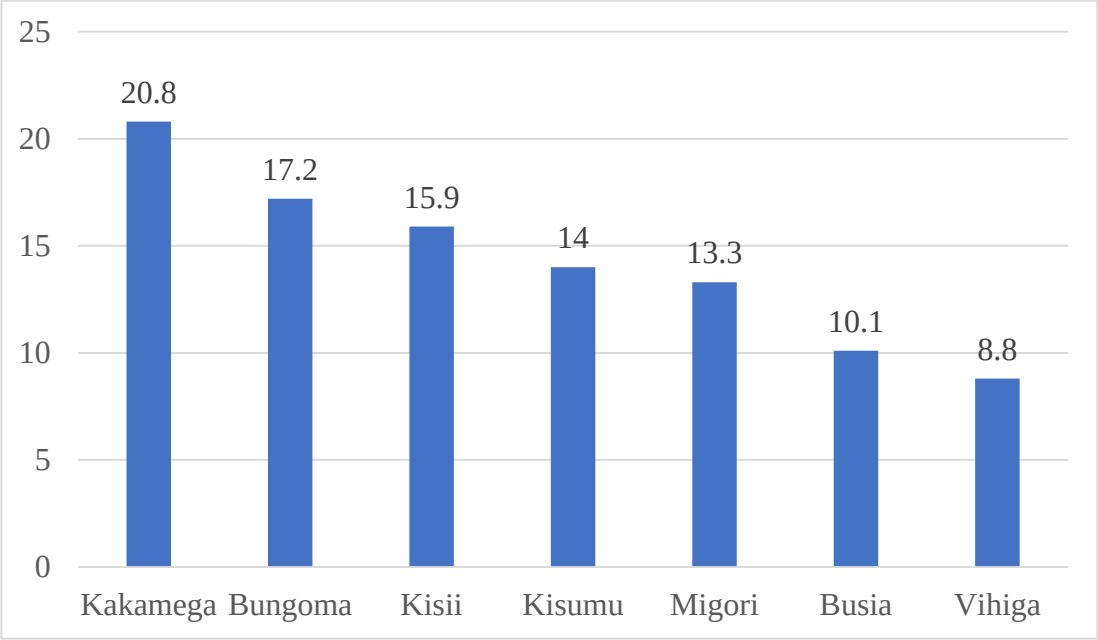

Figure 4.1: Demographic Characteristics

Regarding the age of the respondents as projected in Table 4.10, the findings indicated that, majority of the respondents for this study were between 42 and 49 years in age representing 53.9% followed by 41.6% representing the ones who were 50 years and above with 4.5% of the respondents being those between 34 and 41 years in age. The results also revealed that 15.9% of the respondents were having on job experience of between 11 and 15 years, 45.8% had on job experience of between 16 and 20 years while 38.3% of the respondents had over 20 years of experience. This implies that the most experienced head teachers and County Directors of Education were in a better position to explain project management practices as it explains the success factors of the Digital Literacy Programme in their various primary schools.

Table 4.10: Age and Experience of the Respondents

Age	Frequency	Percent	Experience	Frequency	Percent
34-41	14	4.5	11-15	49	15.9
42-49	166	53.9	16-20	141	45.8
50 and above	128	41.6	Above 20	118	38.3
Total	**308**	**100.0**	**Total**	**308**	**100.0**

4.5. Descriptive Statistics of Variables in the Study

The study did seek to interrogate the relationship between project management practices success factors of Digital Literacy Programme in Western Kenya. To describe a distribution of the scores of measurements using indices or statistics, the study employed descriptive statistics to summarize the responses using percentages, mean and standard deviation.

4.5.1. Success of Digital Literacy Programme (DLP) in Western Kenya.

To explore the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya, the researcher sought to find information regarding the success factors of Digital Literacy Programme in most public primary schools in Western Kenya which is the main response variable in this study.

Most of the respondents agreed that project completed within planned budget contributes to project success as indicated by 54.4% in Table 4.10. Similarly, 53.9% of the respondents agreed that it is important to achieve the quality standards mentioned in the specifications for a successful project. Also, 49% and 46.8% respectively agreed that a project is successful if completed within proposed timelines and it is important to comply with technical specifications for project success.

The composite mean for success factors was at 84.7% mean response (mean=4.2326, std. dev. =0.52553) rated high as shown in Table 4.10. The results showed that the responses had a mean greater than 3.0 implying that majority of the respondents agreed about success

factors of Digital Literacy Programme projects in Western Kenya. The results also indicated a standard deviation of less than 0.6 implying that the difference in responses received did not much variation. The findings were as presented in Table 4.11.

Table 4.11: Descriptive Analysis for Project Success.

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree, Max-Maximum, Min-Minimum, Std. Dev.-Standard Deviation, Std. Error of mean-Standard Error of Mean

Statement	**1**	**2**	**3**	**4**	**5**
Project completed within planned budget contributes to project success.	3.3%	3.3%	4.9%	54.4%	34.2%
It is important to achieve the quality standards mentioned in the specifications for a successful project.	1.6%	4.5%	2.9%	53.9%	37%
Project is successful if completed within proposed timelines.	2.3%	3.9%	4.9%	39.7%	49.2%
It is important to comply with technical specifications for project success.	1.6%	4.2%	3.6%	46.8%	43.8%

Average level of Project Success	**Mean(%Mean)**	**Std. Dev.**	**Std. Error of mean**	**Min**	**Max**
	4.1471 (82.9%)	.53875	0.02809	1.40	5.00

As to whether the public primary schools had necessary tools to track success factors of DLP in their respective institutions, Weekly/ Monthly Project Status reports were checked as evidence of measuring milestones in relation to the predetermined goals to determine success rates factors. From the findings of Weekly/ Monthly Project Status reports analysis (see Table 4.11), majority of the sampled reports capturing the success factors of DLP, (69%) showed they were less successful. However, 31% of the sampled reports on success factors of DLP seem to have been successful with respect to analysis of the monthly project status reports. The findings for Document Analysis entailed review of Weekly/ Monthly Project Status reports and are as presented in Table 4.12.

Table 4.12: Document Analysis for Project Success

Document	Project Success	Frequency	% Frequency
Weekly/ Monthly Project Status reports	Successful	9	31%
	Less Successful	20	69%
	Total	**29**	**100%**

The implication is that there seems to be a lack of standardized approach to measuring success factors among public primary schools undertaking the Digital Literacy Programme in Western Kenya which may be explains the diverse perceptions among the stakeholders regarding the success factors of DLP. Stakeholders' expectations and requirements clarify how the project is perceived; the project may be perceived as successful by one of the stakeholders while at the same time unsuccessful by the other (Dağli, 2018). This finding corroborates the findings of Hällgren (2012) who opine that to achieve higher levels of project success, the project management practices frameworks need to be strengthened and project success criteria defined prior to start of the project. According to Hammond (2018) the benchmark for measuring project success varies among different stakeholders, therefore given the multidimensional nature of what constitutes project success, it's important to define success factors up front to carry out a good assessment of project success at or after project completion. Prior to determining whether DLP is a success it should be clear on whether the assessment will be based on traditional success factors (cost, timely and quality), project outcomes and products success or all the three aspects (Rodrigues *et al.*, 2014).

4.5.2 Communication Management

The first objective of this study was to assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya. To achieve this, the researcher sought from the respondents about planning, implementation, and monitoring. The results were as presented in Table 4.13 where it was noted that, majority of the respondents agreed with the sentiments; that all communications with

stakeholders as regard to the project are done in a timely manner and that selected people for the project clearly understood the project objectives, benefits, and risks as indicated by 66.8% and 69.7% respectively. Further, 48.2% of the respondents agreed that the DLP project managers used a variety of communication methods to share information among stakeholders such as emails, notes, letters, face to face, 53.4% agreed that a failure in communication can have a negative impact on the project and, 57.0% agreed that there are official standardized methods to guide communication among the project team members. Also, 63.5% of the respondents strongly agreed that all project team members' sign off minutes of meetings held noting all deliberations discussed while 41.7% agreed that project team members have a feedback mechanism for all communication done.

Table 4.13: Descriptive Analysis for Project Communication Management.

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree.

Statement	**1**	**2**	**3**	**4**	**5**
All communications with stakeholders as regard to the project are done in a timely manner.	3.9%	4.2%	8.5%	66.8%	16.6%
Selected people for the project clearly understands the project objectives, benefits, and risks.	3.3%	16.3%	5.2%	69.7%	5.5%
The project manager uses a variety of communication methods to share information among stakeholders such as emails, notes, letters, face to face.	17.3%	4.2%	2%	48.2%	28.3%
A failure communication can have a negative impact on the project.	19.2%	3.6%	2.6%	53.4%	21.2%
There are official standardized methods to guide communication among the project team members.	17.9%	5.2%	6.5%	57%	13.4%
All project team members' sign off minutes of meetings held noting all deliberations discussed.	2%	8.8%	3.9%	21.8%	63.5%
Project team members have a feedback mechanism for all communication done.	6.5%	4.6%	16.6%	41.7%	30.6%

Average Level of Communication Management	**Mean(%Mean)**	**Std. Dev.**	**Std. Error of mean**	**Min**	**Max**
	3.6577 (73.2%)	.93934	.05361	1.20	4.86

The composite mean for communication management practice for the public primary schools in Western Kenya was 73.2% (mean=3.6577, std. dev. =0.93934 rated high as shown in Table 4.12. The results showed that the responses had a mean of >3.5 implying that communication management practices were significant in determining the success levels of DLP. This is an indication that the communication management practices across the schools was satisfying but had room for improvement therefore a possible factor in determining success of the Digital Literacy Programme in Western Kenya.

As to whether public primary schools in Western Kenya had an effective communication plan, the sampled schools were asked to provide evidence of a communication plan guiding engagements among the DLP stakeholders, and the findings were as presented in Table 4.13. From the findings of document analysis on availability of communication management plan (see Table 4.14) the results indicated that ,70% (majority) of the sampled public primary schools in Western Kenya were able to provide a communication management plan. However, 30% were unable to avail communication management plan implying that the Digital Literacy Programme may have lagged because of a lack of proper co-ordination among stakeholders and even hampering decision making in some ways. This finding also indicated the lack of standardized communication management tools across the public primary schools as a policy in management of school projects.

Table 4.14: Document analysis for Communication Management

Document	Availability	Frequency	% Frequency
Communication Management Plan	Available	20	70%
	Not available	9	30%
	Total	**29**	**100%**

Effective, regular project communication requires planning and tailoring to the appropriate recipient of the information to ensure that all relevant parties can contribute to the project to their fullest extent to meet and exceed expectations (Berzkalns, 2003). Successful projects require successful communication. It therefore follows that project

communication is a critical success factor for successful projects given that, it is a bridge between the project team, other stakeholders and project goals, strategies, and actions (Olena, 2015). Furthermore, to ensure the success of a project much information, including expectations, goals, needs, resources, status reports, budgets and purchase requests, needs to be communicated on a regular basis to all the major stakeholders (Čulo & Skendrović, 2010).

4.5.3 Risk Management

The second objective of this study was to determine the relationship between risk management and success factors of Digital Literacy Programme in Western Kenya. To achieve this, the researcher sought from the respondents about the general risk management. The descriptive analysis of the Risk Management was as presented in Table 4.14 below. Given the results as presented in Table 4.14, 40% of the respondents agreed that they had a risk breakdown structure that was normally used to identify potential risks for mitigation. There was a general neutral opinion among participants that public primary schools in Western Kenya had workshops that are normally organized for risk evaluation to determine high-impact risks, which can help narrow the focus on a few critical risks that require mitigation. On further analysis 43% agreed that Workshops are normally organized for risk evaluation to determine high-impact risks, which can help narrow the focus on a few critical risks that require mitigation.

On the other side, as presented in Table 4.15, 64% of the respondents strongly agreed that after the risks had been identified and evaluated, the project team developed a risk mitigation plan to reduce the impact of unexpected events. 56% agreed that the project team often develop an alternative method for accomplishing project goals when a risk event has been identified that may frustrate the accomplishment of the goals. Also, 58.4%, 60.9% and 48.7% respectively strongly agreed that the project team always considers potential risk in the planning phase and weighed against the potential benefit of the project's success in order to decide if the project should be chosen, that once the project is approved and it moves into the planning stage, risks are identified with each major

group of activities to identify increasing levels of detailed risk analysis and, that during the project implementation phase of the projects, a risk plan is always updated with new information and risks checked off that are related to activities that have been performed. 61.6% of the respondents agreed that during the closeout phase of the projects, agreements for risk sharing and risk transfer is always concluded, and the risk breakdown structure examined to be sure all the risk events have been avoided, minimized, or transferred.

Averagely, the level of Risk Management practice was at 84.0% mean response (mean=4.1976, std. dev. =0.73724) rated high as presented in Table 4.15. This implies that implying that risk management practices were significant in determining the success factors of DLP hence the public primary schools seem to have a plan on ways to tackle potential risks, though the risk management practices had some slight room for further improvement.

Table 4.15: Descriptive Analysis for Risk Management.

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree.

Statement	1	2	3	4	5
We have a risk breakdown structure that we normally use to identify potential risk for mitigation.	1.6%	4.9%	17.2%	40.9%	35.4%
Workshops are normally organized for risk evaluation to determine high-impact risks, which can help narrow the focus on a few critical risks that require mitigation.	3.6%	2.9%	44%	14.7%	34.9%
After the risk has been identified and evaluated, the project team develops a risk mitigation plan to reduce the impact of an unexpected event	1.3%	1.3%	0%	33.4%	64%
The project team often develops an alternative method for accomplishing a project goal when a risk event has been identified that may frustrate the accomplishment of that goal.	4.2%	18.6%	1.3%	56%	19.9%
The project team always considers potential risk in the planning phase and weight against the potential benefit of the project's success in order to decide if the project should be chosen.	1.6%	2.3%	0%	37.7%	58.4%
Once the project is approved and it moves into the planning stage, risks are identified with each major group of activities to identify increasing levels of detailed risk analysis.	1.6%	2.3%	2.9%	32.2%	60.9%
In the project implementation phase of the projects, risk plan is always updated with new information and risks checked off that are related to activities that have been performed.	2.9%	7.1%	0.6%	40.6%	48.7%
During the closeout phase of the projects, agreements for risk sharing and risk transfer is always concluded, and the risk breakdown structure examined to be sure all the risk events have been avoided or mitigated.	1%	1.6%	0.7%	61.6%	35.2%

Average level of Risk Management	Mean(%Mean)	Std. Dev.	Std. Error of mean	Min	Max
	4.1976 (84.0%)	0.73724	.02755	1.875	4.88

As to whether the public primary schools in Western Kenya were able to account for their handling of anticipated project risks, the sampled schools were asked to provide evidence of filled Risk Registers and the findings were as presented in Table 4.16. From the findings of document analysis on availability of risk registers, majority of the public primary

schools (73%) had a well implemented risk mitigation plan during DLP implementation evidenced by availability of a risk register. However, 27% of the public primary schools sampled had no evidence of risk registers which is essential to the management of risks, implying poor management of project risks and in some cases the registers were inadequately compiled indicating poor risk management practices.

Table 4.16: Document analysis for Risk Management

Document	Availability	Frequency	% Frequency
Risk Register	Available	21	73%
	Not available	8	27%
	Total	**29**	**100%**

A risk register is a document that stores information about risks and will normally include columns like "likely risk event date," "probability," "impact," and "person responsible for risk response plan" in addition to other columns (Shrivastava, 2012). It is therefore important to have risk management tools like risk register in practice to assist in management of project risks. Studies by scholars have indicated that the cause of the project's failure can be directly attributed to the extent of risk management practices undertaken and it therefore implies that the level of risk management practices undertaken during a project impact directly on its success (Kishk, & Ukaga, 2008).

4.5.4 Stakeholder Management

The third objective of this study was to examine the relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya. To achieve this, the researcher probed the respondents about the general stakeholder management practices. The descriptive analysis of the stakeholder management practices findings were as presented in Table 4.17. Majority of the respondents agreed that people selected as stakeholders benefit from projects initiated, that the project team members were selected at a point that they had the greatest impact on the project and that people selected had requisite skills to handle the project and freely voice their concerns, before

decision were made as indicated by 73.9%, 67.8% and 65.1% respectively. Further, 50.5% agreed that the project team or organization selected held positions from which they could influence the project and 40.7% agreed that people selected as stakeholders had competing agendas which were not revealed at the start of the project as indicated in Table 4.17. The composite mean for stakeholder management practices for the primary schools in Western Kenya with regards to DLP was at 80.0% (mean=3.9987, std. dev. =0.73724) rated high as presented in Table 4.17. An implication that the stakeholder management practices by the school were considerably effective hence a possible factor in the success of Digital Literacy Project in Western Kenya.

Table 4. 17: Descriptive Analysis for Stakeholder Management:

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree

	1	2	3	4	5
People selected as stakeholders benefit from projects initiated.	1.3%	3.6%	2%	73.9%	19.2%
The project team members are selected at a point that they have the greatest impact on the project.	2%	10.7%	1.3%	65.1%	20.8%
The project team or organization selected holds a position from which they can influence the project.	2.9%	3.3%	2.9%	50.5%	40.4%
People selected have requisite skills to handle the project and freely voice their concerns, if need be, before decision are made.	3.6%	4.6%	0.0	67.8%	24.1%
People selected as stakeholders had competing agendas which were revealed at the start of the project.	3.9%	2.3%	36.2%	40.7%	16.9%

Average level of Stakeholder Management	**Mean(%Mean)**	**Std. Dev.**	**Std. Error of mean**	**Min**	**Max**
	3.9987 (80.0%)	.73724	.04208	1.00	5.00

As to whether the public primary schools in Western Kenya were able to account for their stakeholders through filling stakeholder identification registers (forms), the sampled respondents were asked to provide evidence of completed stakeholder identification forms associated to the Digital Literacy Programme and the findings were as presented in Table 4.18.The results indicate that majority of the sampled public primary schools (76%) were

able to provide filled stakeholder identification forms as evidence of identification of their respective stakeholders involved in Digital Literacy Programme. However, 24% of the sampled schools had no evidence of stakeholder register forms an implication that stakeholder management practices were defective and therefore not uniform across the schools.

Table 4.18: Document analysis for Stakeholder Management

Document	Availability	Frequency	% Frequency
Stakeholder Identification register	Available	22	76%
	Not available	7	24%
	Total	**29**	**100%**

The findings indicated that stakeholders were identified before implementation of the Digital Literacy Programme in most of the public primary schools in Western Kenya, an implication that stakeholder management practices were conducted right from onset of the project hence a possible success factor of DLP. Effective identification, engagement, and empowerment of project stakeholders significantly improves the chances of successful project implementation given that they work together to maximize opportunities among them (Retfalvi, 2014). According to Zarewa (2019) factors such as failure to understand stakeholders' needs and expectations, uncooperative attitude of stakeholders, failure to identify key stakeholders, failure to identify potential conflict areas, project manager's poor knowledge of stakeholder management (SM), late identification of stakeholders, issuance of incorrect information to stakeholders, lack of stakeholder engagement/involvement, conflicts between stakeholders, misunderstanding of roles by stakeholders, lack of fairness and equity for all stakeholders have the highest levels of impact against project success .

4.5.5 Scope Management

The fourth objective of this study was to establish the relationship between scope management and success factors of Digital Literacy Programme in Western Kenya. To

achieve this, the researcher asked the respondents about management of the scope of Digital Literacy Programme in public primary schools in Western Kenya. The study findings were as detailed in the subsequent sub-sections. The descriptive analysis of the scope management findings was as presented in Table 4.19. The findings revealed that 45.3% of the respondents strongly agreed that all the project activities identified were known from the onset of the project as presented in Table 4.19. Also, 66.1%, 49.5%, 81.1%, 63.5% and 76.5% of the respondents respectively agreed with the following sentiments; that change in project activities results to change in project outcome quality, that in case there was need to change the project scope, a scope change request form was filled, analyzed, reviewed and approved by stakeholders, that changes in project activities resulted to change in project cost, that changes in project activities resulted to change in project schedule/time and, agreed that during scope planning all key stakeholders were involved as presented in Table 4.19.

A section of 37.1% of the respondents disagreed that the view that there was a clear way of tracking and measuring critical project achievements (milestones) as the project progresses in line with objectives at every stage of implementation. On the other side, 54.4% strongly agreed that there were project team members who were experienced in scope planning while 35.8% and 50.2% respectively agreed that there was a scope management plan initiated before project execution and that there is a detailed scope statement which was availed to all the project stakeholders before the project was executed.

Averagely, the level of scope management practice of the respondents in public primary schools in Western Kenya was at 73.4% mean response (mean=3.6710, std. dev.=0.67908) rated high as shown in Table 4.19. The implication of this finding is that all the processes that define and control the success and accomplishment of a project were well conducted hence significant in determining the success factors of DLP in Western Kenya which are within budget, within schedule and meeting quality requirements.

Table 4.19: Descriptive Analysis for Scope Management:

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree

	1	2	3	4	5
All the project activities identified are known from the onset of the project.	4.6%	8.8%	4.6%	36.8%	45.3%
Change in project activities results to change in Project outcome quality.	2.6%	24.4%	1.3%	66.1%	5.5%
In case there is need to change the project scope, a scope change request form is filled, analyzed, reviewed and approved by stakeholders.	0.7%	8.1%	4.2%	49.5%	37.5%
Changes in project activities resulted to change in Project cost.	4.6%	11.1%	2%	81.1%	1.3%
Changes in project activities resulted to change in Project schedule/time	2.9%	18.2%	2.6%	63.5%	12.7%
During scope planning all key stakeholders were involved.	2.6%	17.6%	1%	76.5%	2.3%
There is a clear way of tracking and measuring critical project achievements (milestones) as the project progresses in line with objectives at every stage of implementation.	4.2%	37.1%	27%	28%	3.6%
There were project team members who were experienced in scope planning.	2.9%	17.9%	3.3%	21.5%	54.4%
There was a scope management plan initiated before project execution	9.8%	4.2%	15%	35.8%	35.2%
There is a detailed scope statement which was availed to all the project stakeholders before the project was executed.	5.5%	25.4%	1.3%	50.2%	17.6%

Average level of Scope Management	**Mean(%Mean)**	**Std. Dev.**	**Std. Error of mean**	**Min**	**Max**
	3.6710 (73.4%)	.67908	.03876	1.00	5.00

Table 4.20 presented that majority of the sampled public primary schools in Western Kenya, 73% were implemented with a well-developed scope management plan with 27% having no evidence of having such a plan in place implying lack of standardized scope management tools across the public primary schools.

Table 4.20: Document analysis for Scope Management

Document	Availability	Frequency	% Frequency
Scope Management Plan	Available	21	73%
	Not available	8	27%
	Total	**29**	**100%**

A scope management plans helps avoid scope creep where the projects deviate from its planned objectives meant to measure success. If project managers do not take advantage of the best practices for documenting and controlling the scope of work on their projects, they are doomed to be controlled by stakeholders' whims, stakeholders with bad memories about what was (or was not) in scope, stakeholders with good memories that know exactly what was originally approved but choose not to remember and great ideas that can have serious consequences to the project's schedule, cost, and final benefit (Millhollan, 2008). A properly defined and managed scope leads to delivering a quality product, in agreed cost and within specified schedules to the stakeholders (Mizra *et al.,* 2013).

4.5.6 Project Complexity

The fifth objective of this study was to determine the moderating effect of project complexity on the relationship between the project management practices (Communication Management, Risk Management, Stakeholder Management and Scope Management) and success factors of DLP in Western Kenya.

The respondents were asked to provide evidence of a Project Complexity Assessment and Management (PCAM) report used to identify, assess, and manage project complexity and the findings were as presented in Table 4.21. From the findings of Project Complexity Assessment and Management (PCAM) report analysis (see Table 4.21, majority of the sampled schools, 83% indicated the project were less complex. However, 17% of the sampled schools seem to indicate the project were complex to implement.

Table 4.21: Document analysis for Project Complexity

Document	Complexity	Frequency	% Frequency
Project Complexity Assessment & Management (PCAM) Report	Complex	5	17%
	Less complex	24	83%
	Total	**29**	**100%**

The purpose of PCAM tool is to identify the key project complexity indicators, assess their potential impact on a project, and design a plan to manage the potential impacts of the complexity indicators (Dao *et al*., 2016).

Further, the respondents were asked to rate the level of complexity during the implementation of DLP in public primary schools in Western Kenya. The statements were measured on a 5-point Liker Scale and the findings were as presented in Table 4.21.The results indicated that 54.7% of the respondents agreed with the following sentiments; that the bottlenecks during execution of the project held up key processes hence delaying project activities, 45.6% of the respondents agreed that the processes or methods to achieve the project goals were unclear, 47.2% agreed that the key risks were not identified early enough and when triggered, were not managed proactively. 54.1% agreed that the project team members numbers were sufficient for this kind of a project, 38.4% agreed that the sub-activities and sub-tasks during execution of the project were diverse and highly unpredictable and 53.7% strongly agreed that the level of innovation within the project was unpredictable and required hiring external consultants as indicated by 54%, 46%, 49%, 57%, 42% and 54% of the respondents respectively in Table 4.21. Averagely, the level of project complexity was at 78.4% mean response (mean=3.9224, std. dev. =68137) rated high as presented in Table 4.21. An implication that project complexity had a significant influence on the relationship between project management practices and success factors of DLP in the schools.

Table 4.22: Descriptive Analysis for Project Complexity:

1-Strongly Disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly Agree.

Statements	1	2	3	4	5
Bottlenecks during execution of the project held up key processes hence delaying project activities	4.2%	6.2%	3.6%	54.7%	31.3%
Processes or methods to achieve the project goals were unclear.	4.2%	7.8%	6.5%	45.6%	35.8%
Key risks were not identified early enough and when triggered, were not managed productively.	7.8%	5.9%	4.9%	47.2%	34.2%
The project team members' numbers were sufficient for this kind of a project.	8.8%	9.1%	4.9%	54.1%	23.1%
Sub-activities and sub-tasks during execution of the project were diverse and highly unpredictable.	7.8%	5.5%	31.3%	38.4%	16.9%
Level of innovation within the project was unpredictable and required hiring external consultants.	1.6%	4.6%	8.8%	31.3%	53.7%

Average level of Project Complexity	Mean(%Mean)	Std. Dev.	Std. Error of mean	Min	Max
	3.9224 (78.4%)	.68137	.03876	1.8333	4.83

4.5.7 Project Management Practices, Complexity and Project Success Summary

The composite means and standard deviations of the individual variables were also calculated and summarized. The results are as presented in Table 4.22. Basing on the findings as presented in Table.4.22, risk management (M=4.1976, SD= 0.48349) was ranked the most satisfactory project management practice followed by stakeholder management (M=3.9987, SD=0.73724); with the least ranked practice being scope management (M=3.6710, SD=0.67908). However, the results indicated a mean response greater than 3.5 implying that all the practices (independent variables) were significant in determining success factors of Digital Literacy Programme in Western Kenya. The results also had the standard deviations less than 1.0 implying the responses were very close.

Table 4.23: Status of Descriptive Statistics

Variable	Mean	SD	N
Project Success	4.1471	.53875	308
Project Complexity	3.9224	.68137	307
Communication Management	3.6577	.93934	307
Risk Management	4.1976	.48349	307
Stakeholder Management	3.9987	.73724	307
Scope Management	3.6710	.67908	307

4.6 Diagnostic Tests Results

Simple Linear Regression Model was adopted in this study to model the relationship between the Project Management Practices (Independent Variables) and Success Factors of Digital Literacy Programme (Dependent Variable). The study dataset was tested for purposes of inference or prediction, if it satisfied all the assumptions of this model which included: Normality, Linearity, Homoscedasticity, and presence of outliers. This is critical because scientific insights yielded by a regression model that has violated these assumptions may be at best, inefficient or at worst, seriously biased or misleading (Oteki, 2019). The findings of these assumptions' tests were as shown below.

4.6.1 Normality Test

To check for normality, the study adopted the Shapiro-Wilk test to test for the assumption of normal distribution of the study variables; Project success, Communication Management, Risk Management, Stakeholder Management, Scope Management; and Project Complexity. The null hypotheses were that; the scores for the Project success, Communication Management, Risk Management, Stakeholder Management, Scope Management and Project Complexity variables were not significantly different from a normal distribution.

The Shapiro-Wilk test results were as presented in Table 4.23 which indicated that the p-values for all the variables were greater than 0.05 level of significance; Project Success (W=0.804, p-value=0.120>0.05); Communication Management (W=0.767, p-

value=0.233>0.05); Risk Management (W=0.677, p-value=0.873>0.05); Stakeholder Management (W=0.780, p-value=0.910>0.05); Scope Management (W=0.830, p-value=0.910>0.05); Project Complexity (W=0.813, p-value=0.131>0.05); Experience (W=0.900, p-value=0.094>0.05). We therefore rejected the null hypothesis and concluded that Project Success, Communication Management, Risk Management, Stakeholder Management, Scope Management, Project Complexity, and Experience were significantly normally distributed.

The findings were as presented in Table 4.23.

Table 4.24: Summary of Normality test for Distribution of scores for Variables

Variable Construct		Shapiro-Wilk test		
		Statistic (W)	Df	p-value
1.	Project Success	.804	304	.120
2.	Communication Management	.767	304	.233
3.	Risk Management	.677	304	.873
4.	Stakeholder Management	.780	304	.910
5.	Scope Management	.830	304	.700
6.	Project Complexity	.813	304	.131
7.	Experience	.900	304	.094

4.6.2 Test for Linearity

A linearity test is conducted to find out whether the sampled data from a population that relates the dependent and independent variables of interest (X and Y) has a straight-line relationship.

Linearity Test

Normal probability plots were adopted in this study to test for the linearity between Communication Management, Risk Management, Stakeholder Management, Scope Management, and Success factors of DLP. The findings of this test were as presented in Figure 4.2, Figure 4.3, Figure 4.4, and Figure 4.5.The results as presented (Figures 4.2, 4.3, 4.4 and 4.5) indicate the points lie along a reasonably straight diagonal line from

bottom left to top right; an indication of a linear relationship between the individual independent variables and dependent variable (Communication Management and Success factors of DLP), (Risk Management and Success factors of DLP), (Stakeholder Management and Success factors of DLP)and (Scope Management and Success factors of DLP), therefore the assumption for linearity holds between dependent and independent variables of interest.

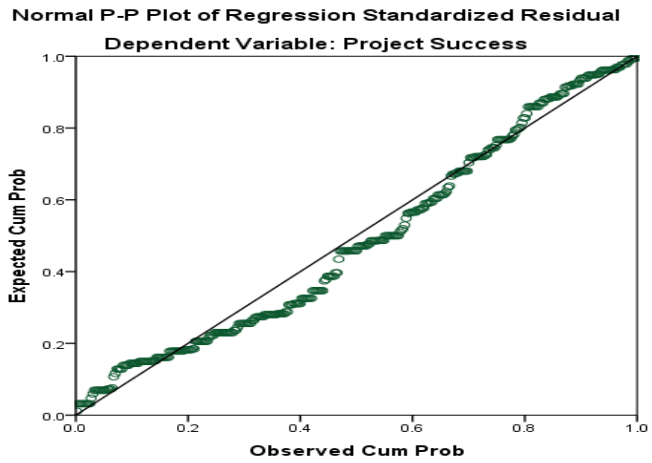

Figure 4.2: Normal P-P Plot for Communication Management

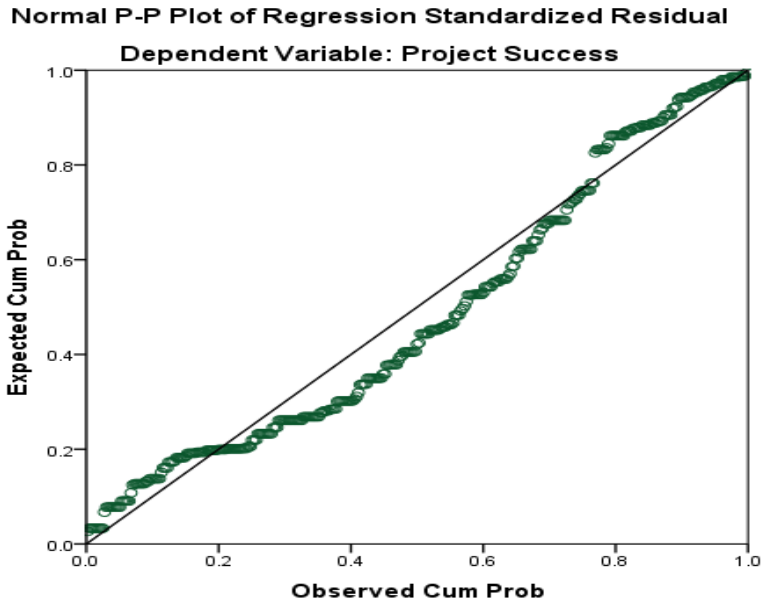

Figure 4.3: Normal P-P Plot for Risk Management

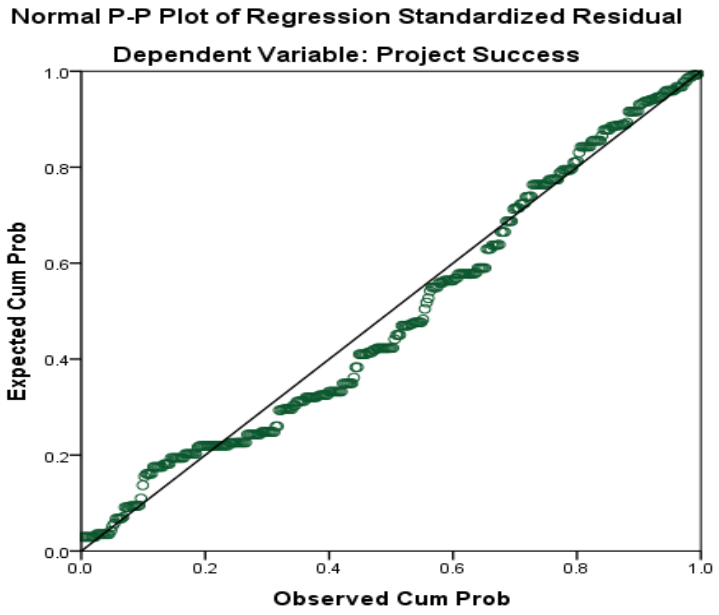

Figure 4.4: Normal P-P Plot for Stakeholder Management

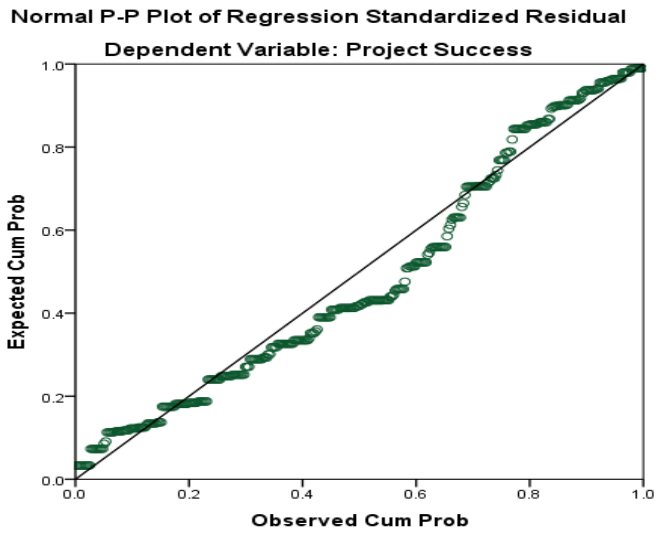

Figure 4.5: Normal P-P Plot for Scope Management

4.6.3 Test for Homoscedasticity

Homoscedasticity test refers to the assumption that the dependent variable exhibits similar amounts of variance across the range of values for an independent variable. To test the simple linear assumption the study adopted use of a Scatter plots. The tests were as presented in Figure 4.6 (Scatter Plot of Standardized Residuals for Communication Management), Figure 4.7(Scatter Plot of Standardized Residuals for Risk Management), Figure 7.8 (Scatter Plot of Standardized Residuals for Stakeholder Management), and Figure (Scatter Plot of Standardized Residuals for Scope Management).

In the residual Scatter plots (see figure 4.6, figure 4.7, figure 4.8 and figure 4.9) shows that the residuals are roughly rectangular distributed, with most of the scores concentrated at the centre, thus an indication that the assumption of Homoscedasticity holds given that dependent variable (Project Success) exhibits similar amounts of variance across the range of values for each independent variable.

a) **Relationship between Communication Management and Project Success Factors**

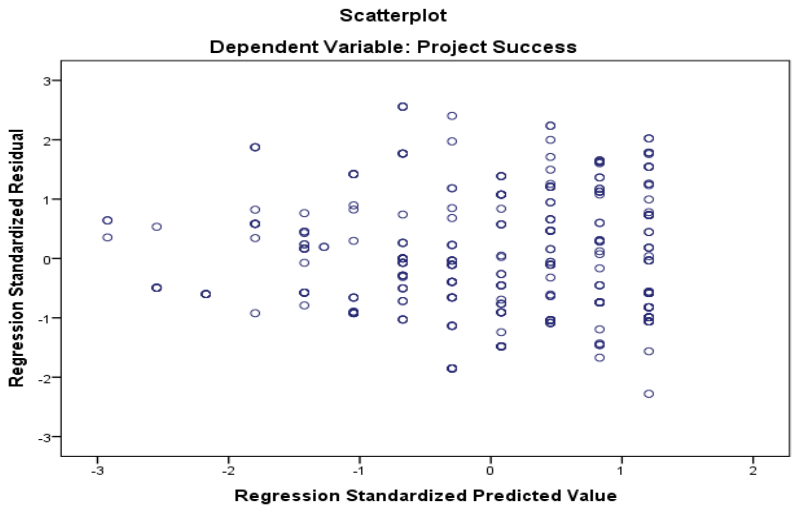

Figure 4.6: Scatter Plot of Standardized Residuals for Communication Management

b) **Relationship between Risk Management and Project Success Factors**

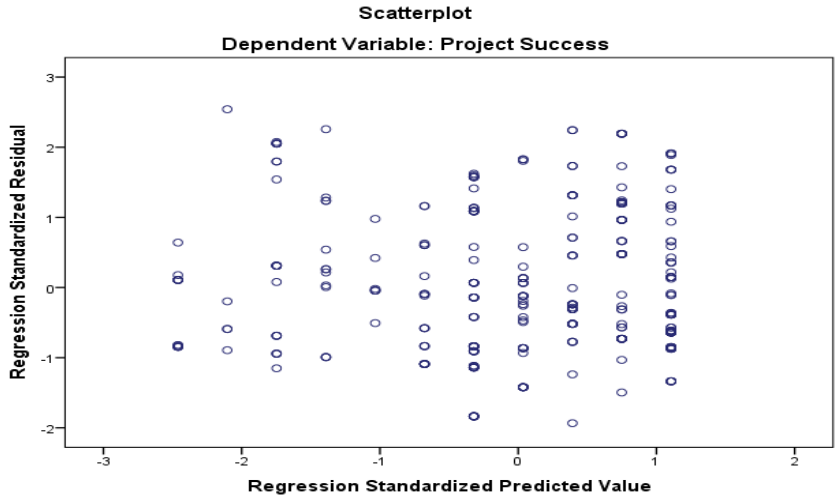

Figure 4.7: Scatter Plot of Standardized Residuals for Risk Management

c) Relationship between Stakeholder Management and Project Success Factors

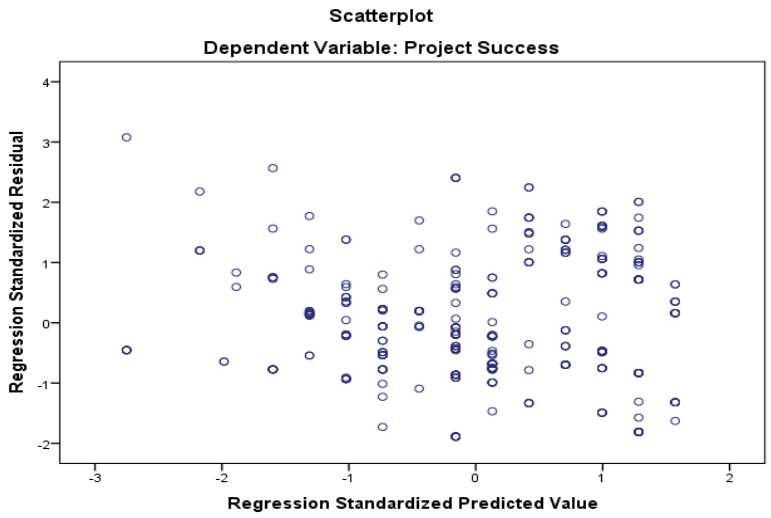

Figure 4.8: Scatter Plot of Standardized Residuals for Stakeholder Management

d) Relationship between Scope Management and Project Success Factors

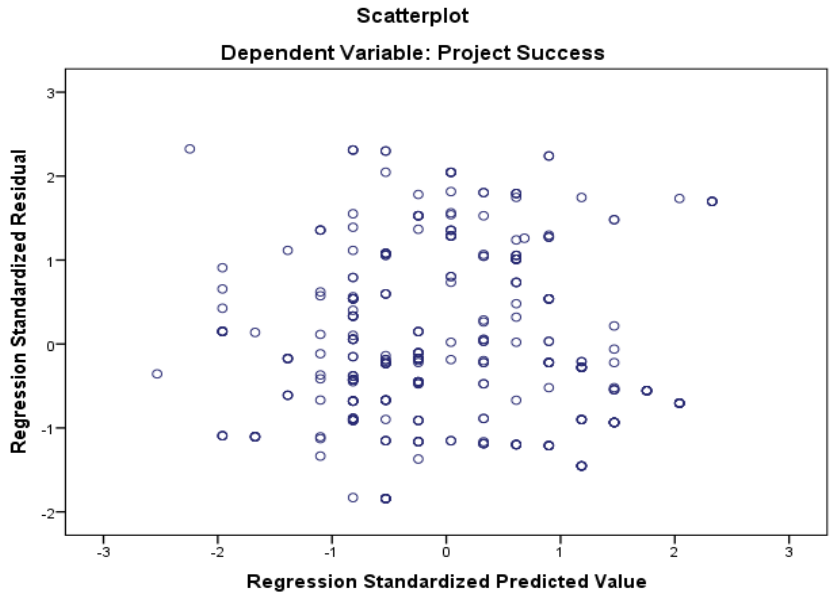

Figure 4.9: Scatter Plot of Standardized Residuals for Scope Management

4.6.1 Test for Outliers

According to Gravetter *et al,* (2000), outliers are defined as points that extend more than 1.5 box-lengths from the edge of the box plot (indicated with a small circle *o*) and extreme points (indicated with an asterisk * in a box plot) are those that extend more than 3 box-lengths from the edge of the box plot. Test for presence of outliers involved the use of box plots.

Test for Outliers in Project Success Scores

The test findings for this assumption were as presented below in Figure 4.10. The results indicated that there were no presence of outliers nor extreme values in the data scores for Project Success scores since there was not any value extending more than the 1.5 box-lengths from the edge of the box plots therefore this assumption holds.

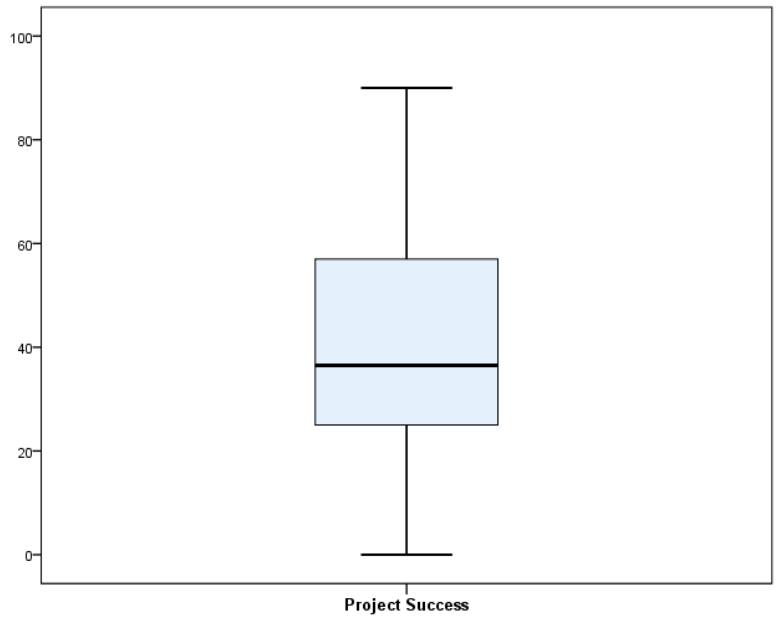

Figure 4.10: Test for presence of outliers for Project Success

Test for Outliers in Communication Management Scores

The test finding for this assumption was as shown below in Figure 4.11. The results (see Figure 4.11) show there were no presence of outliers nor extreme values in the Communication Management scores for Project Success scores since there were no values extending more than the 1.5 box-lengths from the edge of the box plots therefore this assumption holds.

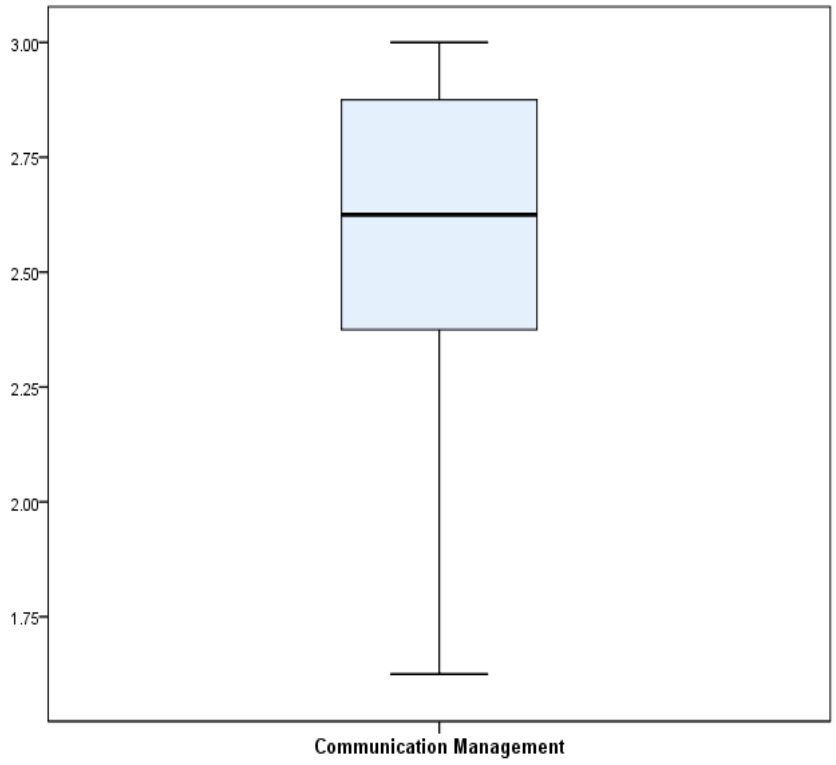

Figure 4.11: Test for presence of outliers for Communication Management

Test for Outliers in Risk Management Scores

The test findings for this assumption were as presented in Figure 4.12.

From the results as presented in Figure 4.12, there were no presence of outliers nor extreme values in the data scores for Risk Management since there was not any value extending more than 1.5 box-lengths from the edge of the box plots therefore this assumption holds.

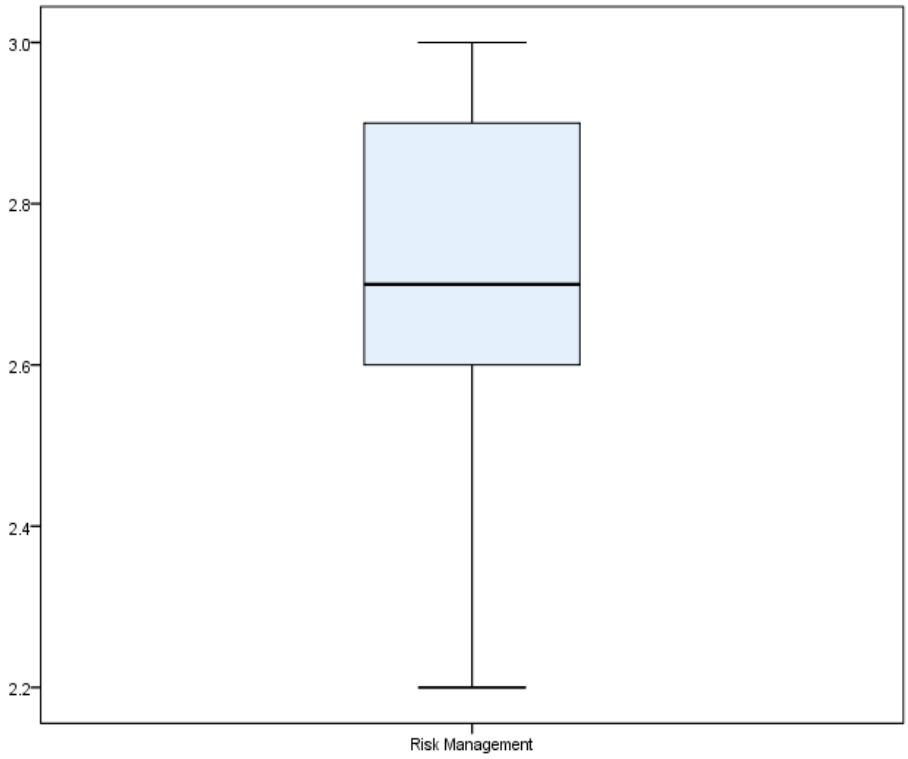

Figure 4.12: Test for presence of outliers for Risk Management

Test for Outliers in Stakeholder Management Scores

The test findings for this assumption were as presented in Figure 4.13.

From the results as presented in figure 4.13, the box plot indicated there were no presence of outliers nor extreme values in the data scores for all the variables (Project Success and Stakeholder Management) since there was not any value extending more than 1.5 box-lengths from the edge of the box plots therefore this assumption holds.

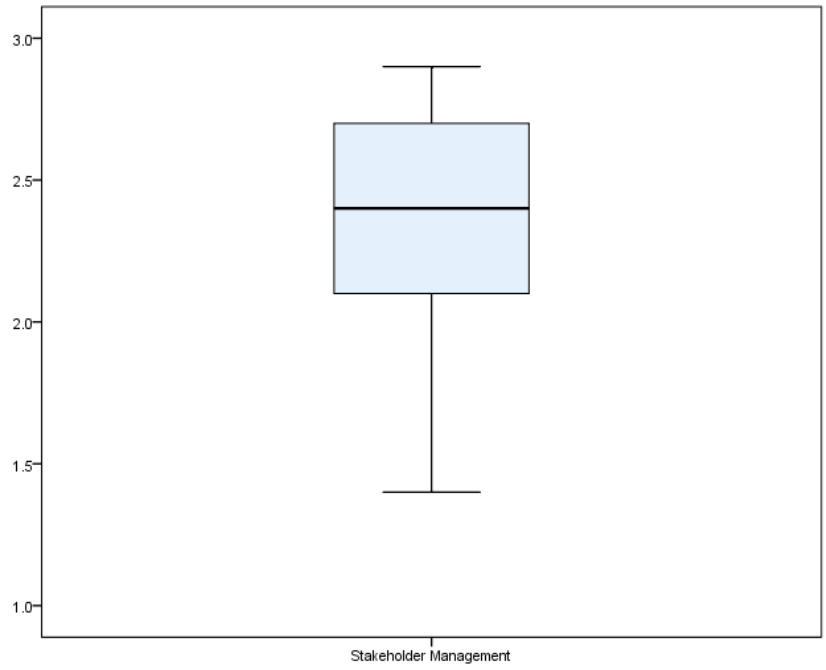

Figure 4. 13: Test for presence of outliers for Stakeholder Management

Test for Outliers in Scope Management Scores

The test findings for this assumption were as presented below in Figure 4.14.

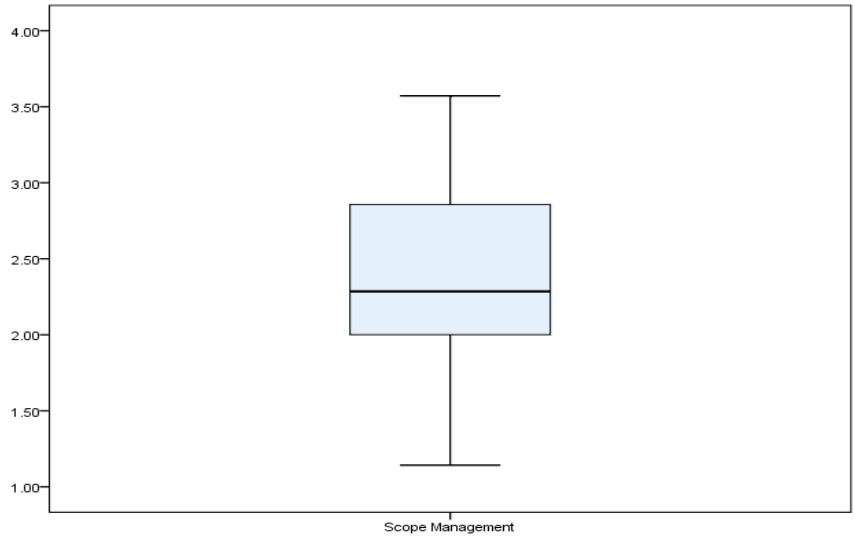

Figure 4.14: Test for presence of outliers for Scope Management

The results presented in Figure 4.14 indicated there were no presence of outliers nor extreme values in the data scores for Scope Management since there was not any value extending more than 1.5 box-lengths from the edge of the box plots therefore this assumption holds.

4.6.5. Multicollinearity Test

Collinearity denotes the circumstance in which one predictor variable in a multiple regression model can be linearly predicted from the others with a substantial degree of accuracy (Brien, 2007); this phenomenon among the independent variables leads to an effect, whereby the regression model fits the data well, but none of the explanatory variables has a significant influence in forecasting the dependent variable (Brien, 2007). The study adopted the use of Variance Inflation Factor (VIF) to detect any problem of collinearity. According to Brien (2007), its recommended that independent variables with VIF higher than 5 or a tolerance value less than 0.2 should be removed from the multiple linear regression model this indicates presence of multicollinearity. The results of collinearity test were as presented in Table 4.24.

Table 4.25: Multicollinearity test using Variance Inflated Factor (VIF)

Variable	Tolerance (1/VIF)	VIF
Communication Management	0.441	2.270
Risk Management	0.458	2.184
Stakeholder Management	0.391	2.556
Scope Management	0.501	1.997

The findings of collinearity test as shown in Table 4.24 above, shows that the tolerance values for all the four variables are above 0.20 and VIF values are below 5; this indicates that there was no collinearity among the independent variables thus all the four independent variables were included in the multiple linear regression model.

4.7 Inferential Analysis

In this section, the study infers the sample findings to the study population through correlation analysis, linear regression analysis and moderation analysis and the findings are as shown below.

4.7.1 Correlation Analysis

Correlation analysis is used to determine the strength and direction of the relationship between the Project Management Practices (Communication Management, Risk management, Scope Management, Stakeholder Management), Project complexity, and the success factors of Digital Literacy Programme (project success) and the findings were as presented in Table 4.25.

The results as presented in Table 4.25 below, indicate that all the relationships were positive, and significant (p-value=0.001) implying that project management practices were positively and significantly related with project success. The most significant relationship was between risk management and project success, (r= 0.631, p-value =

0.000<0.05) followed by the relationship between project success and stakeholder management, (r= 0.613, p-value = 0.000<0.05).

The correlation analysis between communication management and project success (r= 0.254, p-value = 0.000<0.05) though positive was the least significant compared to the other relationships. This weaker value of correlation implies that the public primary schools in Western Kenya needed to pay more attention to their project communication management practices.

Table 4.26: Correlation Summary Matrix

		Project Success	Communication Management	Risk Management	Stakeholder Management	Scope Management
Project Success	Pearson Correlation	1				
	P-value					
	N	308				
Communication Management	Pearson Correlation	.254**	1			
	P-value	.000				
	N	307	307			
Risk Management	Pearson Correlation	.631**	.186**	1		
	P-value	.000	.001			
	N	308	307	308		
Stakeholder Management	Pearson Correlation	.613**	-.276**	.657**	1	
	P-value	.000	.000	.000		
	N	307	306	307	307	
Scope Management	Pearson Correlation	.557**	.565**	.465**	.230**	1
	P-value	.000	.000	.000	.000	
	N	307	306	307	306	307
Project Complexity	Pearson Correlation	.437**	-.297**	.611**	.790**	.102
	P-value	.000	.000	.000	.000	.075
	N	307	306	307	306	306

**. Correlation is significant at the 0.01 level (2-tailed).

4.7.2 Linear Regression Analysis

The study used the linear regression analysis to assess the relationship between project management practices (communication management, risk management, scope management, stakeholder Management) and success factors of DLP in Western Kenya.

Communication Management and Success Factors of DLP

The study sought a Simple Linear Regression between communication management and success factors of DLP in Western Kenya, by assessing the relationship between communication management and success factors. The researcher tested the following hypothesis.

H_{01}*: *There is no significant relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.

The findings were as presented in Table 4.26. where the ANOVA test results were F (1, 305) =21.022, P = 0.000< 0.05; an indication that the Simple Linear Regression model was a good fit to our dataset. The model (Communication Management) was able to explain 6.1% of the variation in the Success factors of DLP in Western Kenya as indicated by the Adjusted R Square = 0.061 as shown in the model summary of Table 4.26.

Basing on the results as presented in Table 4.26 below, the regression Coefficient results showed that β= 0.145, *t =4.585, p=0.000<0.05*; therefore, communication management had a statistically significant effect on the success of DLP in Western Kenya. Communication Management had a positive standardized beta coefficient = 0.345 as shown in the coefficients results of Table 4.27; this indicates that the Success of Digital Literacy Programme is predicated to improve by 0.345 when the Communication Management practice variable goes up by one. To predict the Project Success of Digital Literacy Programme in Western Kenya when given the level of Communication Management, the study suggests the use of the following model.

Project Success = 3.618 + 0. 145 Communication Management

Planning for communications, robust implementation of the communication plan, and monitoring and controlling of communications is essential for success of Digital Literacy Programme in Western Kenya. It is important to have project personnel conversant with project objectives, benefits, and risks through timely communication. The above sentiments are supported by Alotaibi (2019) who argues that effective communication management creates a bridge between diverse project stakeholders with different cultural and organizational backgrounds, different levels of expertise, and different perspectives and interests, which impact or have an influence upon the project execution or outcome hence very critical for project success.

Table 4.27: Linear Regression Analysis between Communication Management and Success Factors of DLP in Western Kenya

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.254[a]	.064	.061	.52115

a. Predictors: (Constant), Communication Management
b. Dependent Variable: Project Success

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.709	1	5.709	21.022	.000[b]
	Residual	82.838	305	.272		
	Total	88.547	306			

a. Dependent Variable: Project Success
b. Predictors: (Constant), Communication Management

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	t	Sig.
1	(Constant)	3.618	.120		30.207	.000
	Communication Management	.145	.032	.254	4.585	.000

a. Dependent Variable: Project Success

Risk Management and Project (DLP) Success

The second hypothesis of the study sought to establish the significance of the causal and effect relationship between Risk Management and Success Factors of DLP in Western Kenya. The hypothesis was:

H_{02}*: *There is no significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.

The findings of this hypothesis test were as presented in Table 4.28.

The ANOVA test results presented in Table 4.27 were F (1, 307) =202.926, P = 0.000< 0.05; an indication that the Simple Linear Regression model was a good fit to our dataset. The model (Risk Management) was able to explain 39.7% of the variation in the Success factors of DLP in Western Kenya as indicated by the Adjusted R Square = 0.397 as presented in the model summary of Table 4.27.

The regression Coefficient results showed that β= 0.704, t =14.245, $p=0.000<0.05$; therefore, risk Management had a statistically significant influence on the Success factors of DLP in Western Kenya. This implies that success factors of DLP in Western Kenya depends on early identification and evaluation of risk which aids in development of risk mitigation plan that reduce the impact of unexpected events. It is important that the project team to always consider potential risks in the planning phase and weigh against the potential benefits.

Risk Management had a positive standardized beta coefficient = 0.704 as presented in Table 4.27; this indicates that Success factors of Digital Literacy Programme are predicated to improve by 0.704 when the Risk Management practice variable goes up by one in Western Kenya.

To predict the Success of DLP in Western Kenya when given the level of Risk Management, the study suggests the use of the model below.

Project Success = 1.194 + 0.704 Risk Management

Table 4.28: Linear Regression Analysis between Risk Management and Success Factors of DLP in Western Kenya

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.631a	.399	.397	.41844

c. Predictors: (Constant), Risk Management
d. Dependent Variable: Project Success

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	35.530	1	35.530	202.926	.000b
	Residual	53.577	306	.175		
	Total	89.107	307			

a. Dependent Variable: Project Success
b. Predictors: (Constant), Risk Management

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	T	Sig.
1	(Constant)	1.194	.209		5.719	.000
	Risk Management	.704	.049	.631	14.245	.000

a. Dependent Variable: Project Success

Stakeholder Management and Project (DLP) Success

The third hypothesis of the study sought to examine the significance of the causal and effect relationship between Stakeholder Management and success factors of DLP in Western Kenya. The researcher sought to test for the following hypothesis.

***H_{03}*: *There is no significant relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya*.**

To test the above third objective, the study adopted the approach of Simple Linear Regression analysis and the findings were as presented in Table 4.28.

The ANOVA test results from Table 4.28 were F (1, 305) =183.598, P = 0.000< 0.05; an indication that the Simple Linear Regression model was a good fit to our dataset. The model (Stakeholder Management) was able to explain 32.8% of the variation in the Success of DLP in Western Kenya as indicated by the Adjusted R Square = 0.328 as shown in the model summary of Table 4.28. The regression Coefficient results showed that β= 0.448, *t* =13.550, *p=0.000<0.05*; hence stakeholder Management had a statistically significant influence on the Success of DLP in Western Kenya. Stakeholder Management had a positive standardized beta coefficient = 0.613 as presented in the coefficients results of Table 4.28; The findings presented show that Success Factors of Digital Literacy Programme is predicated to improve by 0.614 when the Stakeholder Management practice variable goes up by one in Western Kenya. To predict the Success of DLP (Project) in Western Kenya when given the level of Stakeholder Management, the study suggests the use of the following model.

Project Success = 2.358 + 0.448 Stakeholder Management

The findings demonstrate that project success is positively influenced by Stakeholder management. Given the above findings, the study notes that, it is crucial to have people selected as stakeholders benefit from projects initiated. Also, the project team or organization selected should hold a position from which they can influence the project success. That is, stakeholder should have requisite skills to handle the project and freely voice their concerns, if need be, before decisions are made.

Table 4.29: Linear Regression Analysis between Stakeholder Management and Success Factors of DLP in Western Kenya

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.574a	.330	.328	0.45520

a. Predictors: (Constant), Stakeholder Management
b. Dependent Variable: Project Success

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.371	1	33.371	183.598	.000b
	Residual	55.436	305	.182		
	Total	88.807	306			

a. Dependent Variable: Project Success

b. Predictors: (Constant), Stakeholder Management

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients		
Model		β	Std. Error	Beta	T	Sig.
1	(Constant)	2.358	.134		17.541	.000
	Stakeholder Management	.448	.033	.613	13.550	.000

a. Dependent Variable: Project Success

Linear Regression Scope Management and Project (DLP) Success

The fourth hypothesis of the study sought to establish the influence of Scope Management on success of DLP in Western Kenya, the researcher sought to test for the following hypothesis.

H_{04}: *There is no significant relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.*

The findings were as presented in Table 4.30. The ANOVA test results as presented in Table 4.31 were F (1, 305) =136.878, P = 0.000< 0.05; an indication that the Simple Linear Regression model was a good fit to our dataset. The model (Scope Management) was able

to explain 30.8% of the variation in the Success of DLP in Western Kenya as indicated by the Adjusted R Square = 0.308 as presented in the model summary of Table 4.31. The regression Coefficient results showed that β= 0.442, t =11.700, $p=0.000<0.05$; hence Scope Management had a statistically significant influence on the success factors of DLP in Western Kenya. Scope Management had a positive standardized beta coefficient = 0.442 as shown in the coefficients results of Table 4.30; this indicates that an improvement in the Scope Management by 1% was likely to result to an improvement in the Success of DLP in Western Kenya by 44.2%. To predict the Success of DLP in Western Kenya when given the level of Scope Management, the study suggests the use of the following model.

Project Success = 2.528+ 0.442 Scope Management

Table 4.30: Linear Regression Analysis between Scope Management and Success Factors of DLP in Western Kenya

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557a	.310	.308	.44830

a. Predictors: (Constant), Scope Management
b. Dependent Variable: Project Success

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	27.509	1	27.509	136.878	.000b
	Residual	61.298	305	.201		
	Total	88.807	306			

a. Dependent Variable: Project Success
b. Predictors: (Constant), Scope Management

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	β	Std. Error	Beta		
1 (Constant)	2.528	.141		17.944	.000
Scope Management	.442	.038	.557	11.700	.000

a. Dependent Variable: Project Success

4.7.3 Multiple Linear Regression

The study sought to understand the partial effect of the Project Management Practices (Communication Management, Risk Management, Stakeholders Management and Scope Management) on the Success factors of Digital Literacy Programme (DLP). The Multiple Linear Regression Model was used to determine the partial effect of the Project Management Practices (Communication Management, Risk Management, Stakeholders Management and Scope Management) on the Success factors of Digital Literacy Programme (DLP) in Western Kenya. The results of this analysis were as presented in Table 4.30.

ANOVA results as presented in Table 4.30 were, $F(4, 300) = 123.931$, $p = 0.000 < 0.05$; an indicator that the multiple linear regression model was a good fit to our dataset. The model (Communication Management, Risk Management, Stakeholder Management and Scope Management) was able to explain 61.8% of the variation in the Success Factors of Digital Literacy Programme in Western Kenya as indicated by the Adjusted R Square = 0.618 as presented in the model summary in Table 4.31. Basing on the findings as presented in Table 4.30, the study observed that the Project Management Practices had a significant partial influence in predicting Success Factors of DLP in Western Kenya as indicated by the significant unstandardized beta coefficients: Communication Management had $\beta = 0.175$, $t = 5.654$, p-value = 0.00 < 0.05, Risk management had $\beta = 0.148$, $t = 2.441$, p-value = 0.015 <0.05; Stakeholder Management had $\beta = 0.444$, $t = 10.350$, p-value = 0.000< 0.05 and Scope Management had $\beta = 0.156$, $t = 3.903$, p-value = 0.000 < 0.05 which were significant at 5% level of significance. The constant was found to be significant, that is, $\beta = 0.612$, $t = 3.149$, p-value = 0.002 < 0.05; this indicates that apart from the four Project Management Practices (Communication Management, Risk Management, Stakeholder Management and Scope Management), there are other variables, not included in the model, that are related to Success factors of Digital Literacy Programme in Western Kenya, thus paving way for further research to be done in this area.

To determine the variable that had the most significant influence on the Project Success among the four Project Management Practices, the study used the standardized beta coefficient (Brien, 2007) for which the higher the value of standardized beta coefficient, the stronger a variable is in predicting the dependent variable. From the partial coefficient results of Table 4.32, Stakeholder Management Practice had the greatest influence in predicting Success factors of DLP in Western Kenya as it had the highest standardized beta coefficient of 0.587; this indicated that an improvement in Stakeholder Management Practice by one percent in the presence of the other three factors is likely to lead to improved Success of DLP by 58.7%.From results presented in Table 4.30, communication management practice had the second largest influence in predicting the Success factors of DLP in Western Kenya as it had the second highest standardized beta coefficient value of 0.302; an indication that an improvement in communication management practice by one percent, in the presence of the other three factors was likely to lead to improved success of DLP in Western Kenya by 30.2%. Scope management practice had the third largest influence in predicting Success of DLP in Western Kenya as it had the third highest standardized beta coefficient value of 0.196; an indication that an improvement in scope management practice by one percent, in the presence of the other three factors was likely to lead to an improved Success of DLP by 19.6%. Risk Management Practice had the least effect in predicting Success of DLP in Western Kenya as it had the least standardized beta coefficient value of 0.128; an indication that an improvement in risk management practices by one percent, in the presence of the other three factors was likely to lead to an improved Project Success of DLP by 12.8%. Multiple Linear Regression model equation that was used to predict the Success of DLP in Western Kenya when given the Project Management Practices (Communication Management, Risk Management, Stakeholder Management and Scope Management) was:

PS = .528+ 0.175 CM + 0. 048RM + 0. 444 STM + 0. 156SM

Where:

PS = Project Success

CM = Communication Management Practice

RM = Risk Management Practice

STM = Stakeholder Management Practice

SM = Scope Management Practice

Table 4.31: Multiple Linear Regression

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.789[a]	.623	.618	.33244

a. Predictors: (Constant), Communication Management, Risk Management, Stakeholder Management and Scope Management

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	54.785	4	13.696	123.931	.000[b]
	Residual	33.155	300	.111		
	Total	87.940	304			

a. Dependent Variable: Project Success

b. Predictors: (Constant), Predictors: (Constant), Communication Management, Risk Management, Stakeholder Management and Scope Management

Partial Coefficients

Model		**Unstandardized Coefficients**		Standardized Coefficients	T	Sig.
		β	Std. Error	Beta		
1	(Constant)	0.528	0.184		2.874	0.004
	Communication Management	0.175	0.031	0.302	5.654	0.000
	Risk Management	0.148	0.061	0.128	2.441	0.015
	Stakeholder Management	0.444	0.043	0.587	10.350	0.000
	Scope Management	0.156	0.040	0.196	3.903	0.000

a. Dependent Variable: Project Success

4.8 Moderation Analysis

The fifth objective of this study was to determine the moderating effect of project complexity on the relationship between the project management practices (Communication Management, Risk Management, Stakeholder Management and Scope

Management) and success of DLP in Western Kenya. To achieve this, the researcher tested for the following null hypothesis.

***H_{05}**: Project Complexity has no significant moderating effect on the relationship between Project Management Practices and Success Factors of Digital Literacy Programme in Western Kenya.*

To test for this hypothesis, the researcher used SPSS process to run the analysis with control variables (age of respondents and years of experience) controlling for the moderation effect on the relationship between dependent and independent variables. This was done in line with studies that found out that demographic variables like gender, different job positions and years of experience may impact project success thus it would be important to treat them as control variables to investigate their impact (Liu, Cao, Duan, & Wu, 2022; Cao, Li, Wang, Luo, & Tan ,2018). This was achieved by undertaking hierarchical regression analysis consisting of five stages yielding four models. In each step the change in R square, F and significance level was noted.

Stage 1 entailed entering control variable in the model in this case, age of the respondents was added in the model. This yielded model 1.

Stage 2 entailed entering control variable in the model in this case, experience of the respondents was added in the model. This yielded model 2.

Stage 3the independent variables (Scope management practices, Risk management Practices, communication management practices and stakeholder management practices) were entered in the model. This yielded model 3.

Stage 4the moderator variable in this case, project complexity was added in the model to yield fourth model.

Stage 5 the interaction effect of independent and moderating variables was entered in the model. This is the cross product of project complexity and individual independent variables. This yielded the fifth model.

From Table 4.31, In Model 1, age was found to have a positive and insignificant relationship with success of Digital Literacy Programme in Western Kenya (p=0.661). The R^2 of 0.001 was obtained in this model. This showed that model 1 could explain 0.1 per cent of variance in the dependent variable (success of Digital Literacy Programme).

In Model 2, experience was found to have a positive and significant relationship with success of Digital Literacy Programme in Western Kenya (p=0.014). The R^2 of 0.021 was obtained in this model. This showed that model 2 could explain 2.1 per cent of variance in the dependent variable (success of Digital Literacy Programme).

In Model 3, all the independent variables were jointly found to have a positive and significant relationship with success of Digital Literacy Programme (p=0.000). The R^2 of 0.616 was obtained in this model. This showed that model 3 could explain 61.6 per cent of variance in the dependent variable (success of Digital Literacy Programme) with an incremental variance of 59.6%.

Further as presented in Table 4.31, Model 4, the findings also showed that when project complexity was added as a moderator, the results obtained indicated that both independent variables and the moderating variable were insignificantly and jointly related to success factors of Digital Literacy Programme (p>0.05). The R^2 was 0.617, p=0.414 representing insignificant increase of 0.01

Finally, to investigate how the project complexity moderates the relationship between Project Management Practices and success of Digital Literacy Programme, the interaction terms of the independent variables (specific variables) and the moderator (project complexity) were entered in the regression model to obtain Model 5. The resultant model indicated that the interaction between project management practices constructs, and

project complexity accounted for significantly more variance than just project complexity and project management practices by themselves, (R^2 = 0.654, p = .000), indicating that there is a potentially significant moderation effect of project complexity on the relationship between project management practices and success of Digital Literacy Programme in Western Kenya. This represents 0.037 significant increase in R-Square.

The findings as presented in Table 4.32, showed the results output of the unstandardized coefficients of a hierarchical regression analysis. Model 1 which contains control variable; age, indicated that age of the respondents (head teacher) insignificantly predicated success of Digital Literacy Programme in Western Kenya as indicated β=0.023, p=0.661. This implies that a percentage change in the age of the respondents would results to insignificant change in project success by 2.3%.

Table 4.32: Moderation Effect on the Relationship between Project Management Practices and Project Success.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.025[a]	.001	-.003	.52499	.001	.193	1	302	.661
2	.143[b]	.021	.014	.52059	.020	6.131	1	301	.014
3	.785[c]	.616	.608	.32811	.596	115.178	4	297	.000
4	.785[d]	.617	.608	.32830	.001	.656	1	296	.419
5	.809[e]	.654	.641	.31401	.037	7.891	4	292	.000

a. Predictors: (Constant), Age

b. Predictors: (Constant), Age, Experience

C. Predictors: (Constant), Age, Experience, Stakeholder, Scope, Risk, Communication

D. Predictors: (Constant), Age, Experience, Stakeholder, Scope, Risk, Communication, Complexity

E. Predictors: (Constant), Age, Experience, Stakeholder, Scope, Risk, Communication, Complexity, Scope*Complexity, Stakeholder*Complexity, Risk*Complexity, Communication*complexity

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.053	1	.053	.193	.661[b]
	Residual	83.235	302	.276		
	Total	83.288	303			
2	Regression	1.715	2	.857	3.164	.044[c]
	Residual	81.574	301	.271		
	Total	83.288	303			
3	Regression	51.314	6	8.552	79.440	.000[d]
	Residual	31.974	297	.108		
	Total	83.288	303			
4	Regression	51.385	7	7.341	68.106	.000[e]
	Residual	31.904	296	.108		
	Total	83.288	303			
5	Regression	54.497	11	4.954	50.246	.000[f]

Model 2 which contains two control variables (experience and age) indicated that experience significantly predicated success of Digital Literacy Programme in Western Kenya as indicated β=0.135, p=0.014. This implies that a percentage increase in experience would results to significant increase in project success by 13.5%. Age of the

respondents was still insignificant (p=0.231). This finding is consistent with that of Lui *et al*., (2018) who found out that older experienced industry practitioners may judge project success differently from younger practitioners.

In the third model, the independent variables were significant as indicated $p<0.05$. This result mirror the findings obtained in multiple linear regressions (Table 4.31). However, experience and age of the respondents insignificantly predicated success of Digital Literacy Programme in Western Kenya after addition of independent variables.

In the fourth model as presented in Table 4.32, when the moderator variable (Project Complexity) was added to model. The moderator was found to be insignificant as indicator by p=0.419 with negative regression coefficient (β=-0.040). This implies that project complexity on its own cannot significantly predict project success; however, it has a negative effect on project success. Similarly, experience and age insignificantly predicated success of Digital Literacy Programme in Western Kenya after addition of independent variables in stage four of the analysis. However, risk management, communication management, scope management and stakeholder management significant predict project success in stage four.

In fifth model as presented in Table 4.32, the interaction terms were added, scope management practices interaction project complexity as well as stakeholder management interaction project complexity were found to be significant as indicated by p=0.003 and P=0.001 respectively. This implies that increase in project complexity would result to reduction in the effect of scope management on Success of Digital Literacy Programme in Western Kenya. Similarly, increase in project complexity would result to reduction in the effect of stakeholder management on Success Factors of Digital Literacy Programme in Western Kenya. However, the interaction effect of project complexity and communication management as well as interaction effect of project complexity and risk management were found to have insignificant negative effect on project success.

Table 4.20: Regression Coefficients for Moderation Effect

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.058	.235		17.288	**.000**
	Age	.023	.053	.025	.439	.661
2	(Constant)	3.945	.237		16.631	**.000**
	Age	-.081	.068	-.088	-1.201	.231
	Experience	.135	.054	.181	2.476	**.014**
3	(Constant)	.677	.230		2.941	**.004**
	Age	-.040	.043	-.043	-.936	.350
	Experience	.037	.035	.049	1.056	.292
	Communication Management	.167	.031	.296	5.441	**.000**
	Risk Management	.128	.060	.112	2.132	**.034**
	Stakeholder Management	.439	.042	.593	10.345	**.000**
	Scope Management	.158	.040	.202	3.990	**.000**
4	(Constant)	.710	.234		3.036	**.003**
	Age	-.041	.043	-.044	-.954	.341
	Experience	.037	.035	.049	1.054	.293
	Communication Management	.163	.031	.289	5.223	**.000**
	Risk Management	.145	.064	.127	2.278	**.023**
	Stakeholder Management	.460	.050	.621	9.232	**.000**
	Scope Management	.154	.040	.197	3.869	**.000**
	Project Complexity	-.040	.049	-.050	-.810	.419
5	(Constant)	-1.871	.911		-2.054	**.041**
	Age	-.069	.041	-.075	-1.680	.094
	Experience	.071	.034	.095	2.096	**.037**
	Communication Management	.522	.216	.922	2.420	**.016**
	Risk Management	.263	.170	.230	1.549	.122
	Stakeholder Management	.520	.081	.702	6.447	**.000**
	Scope Management	.262	.051	.335	5.146	**.000**
	Project Complexity	.937	.278	1.185	3.368	**.001**
	Communication Management*Project complexity	-.087	.051	-.650	-1.714	.088
	Risk Management*Project Complexity	-.048	.046	-.336	-1.027	.305
	Stakeholder Management*Project Complexity	-.063	.021	-.562	-2.976	**.003**
	Scope Management*Project Complexity	-.047	.014	-.274	-3.364	**.001**

a. Dependent Variable: Project Success

The final moderation model is as shown below:

PS = -1.871+0.522CM +263RM +0.520STM +0.262SM +0.937PC-0.087CM*PC-0.048RM *PC-0.063STM*PC-0.047M*PC

Where;

PS = Project Success

CM = Communication Management Practice

RM = Risk Management Practice

STM = Stakeholder Management Practice

SM = Scope Management Practice

PC = Project Complexity

Clearly from model five, various deductions can be made; first, Communication Management interaction with Project Complexity had a negative, meaning that the interactive effect is negative, therefore, as project complexity increases, the level of communication management effect on project success insignificantly decreases (β=-0.087, $p>0.05$). Similarly, Risk Management interaction Project complexity coefficient is also negative, meaning that the interactive effect is negative, therefore, as project complexity increases, the level of risk management effect on project success insignificantly decreases (β=-0.048, $p>0.05$).

However, stakeholder management interaction with project complexity coefficient is negative but significant, meaning that the interactive effect is negative. Therefore, as project complexity increases, the level of stakeholder management effect on project success significantly decreases ($p=0.063$, $P<0.05$). Thus, as project complexity increases by one percent, the level of stakeholder management effect on project success significant increases by 6.3% Similarly, for scope management interaction with project complexity, the coefficient is negative and significant, meaning that the interactive effect is negative. Thus, as project complexity increases by one percent, the level of scope management effect on project success significant increases by 4.7% (β=-0.047, $p=0.001$).

The study found that project complexity practices have a negative significant moderating effect on the relationship between scope management and project success. Figure 4.15 presents a graphical presentation of the moderating effect of project complexity on the relationship between project success and scope management. As shown, low levels of project complexity show a gradual positive slope which is causal relationship between scope management and project success. Increasing the levels of project complexity causes a change in the direction of the relationship as shown in the negative slope of the curve between scope management and project success at medium levels of project complexity. The slope keeps decreasing at higher levels of project complexity implying that increasing the levels of project complexity has a negative moderating effect which decreases the strength of the causal relationship between scope management and project success.

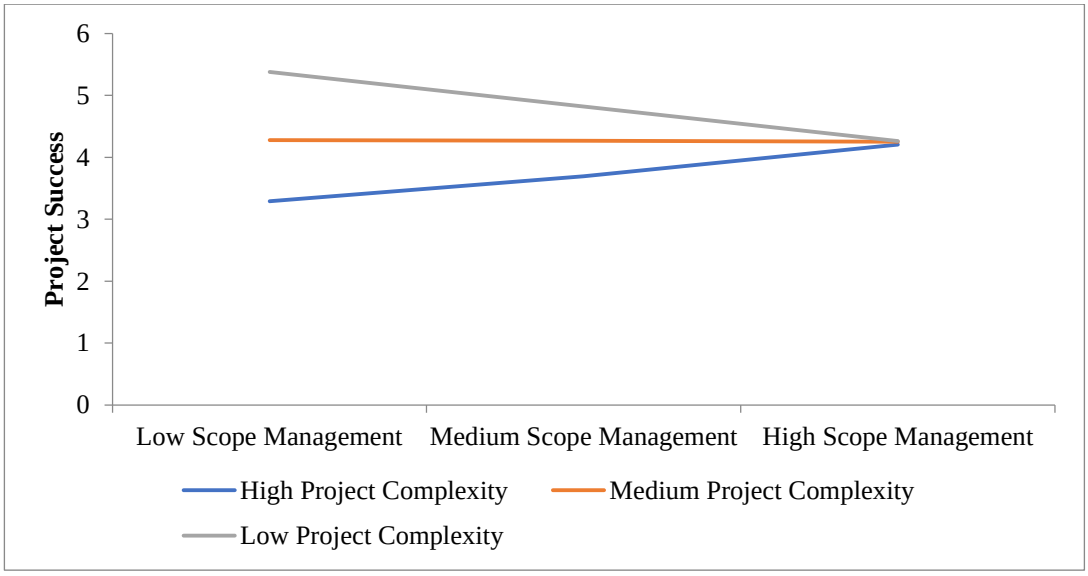

Figure 4.15: Moderating Effect of Project Complexity on Scope Management and Project Success

The study found that project complexity practices have a negative significant moderating effect on the relationship between stakeholders' management and project success. Figure 4.16 presents a graphical presentation of the moderating effect of project complexity on the relationship between project success and stakeholders management. As presented in figure 4.16, low levels of project complexity show a gradual positive slope which is causal

relationship between stakeholder's management and project success. Increasing the levels of project complexity causes a change in the direction of the relationship as shown in the negative slope of the curve between stakeholder's management and project success at medium levels of project complexity. The slope keeps decreasing at higher levels of project complexity implying that increasing the levels of project complexity has a negative moderating effect which decreases the strength of the causal relationship between stakeholders' management and project success.

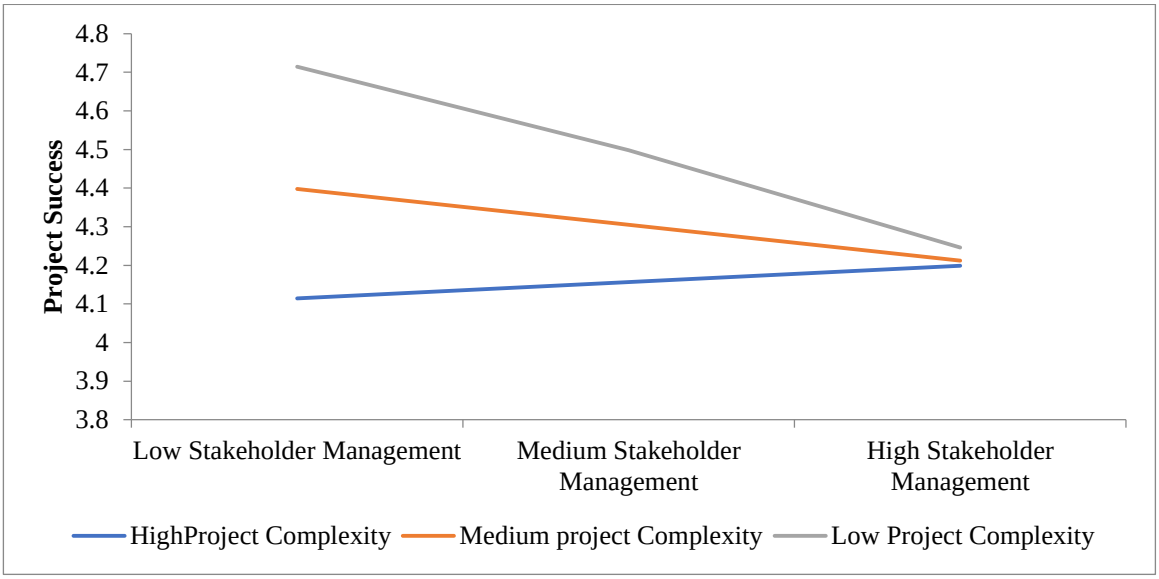

Figure 4.16: Moderating effect of Project complexity on Stakeholder Management and Project Success

4.9 Summary of Hypothesis Tested

This study sought to explore the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya. To achieve this, five specific objectives and subsequently, five corresponding null hypotheses were formulated and tested.

H_{01}: *There is no significant relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.*

The results in Table 4.25 indicated that there was a positive and significant correlation between communication management and project success (r=0.254, p=0.000). Simple linear regression indicated there is direct significant effect of communication management on project success (β=0.145, p=0.000). Multiple linear regression unstandardized coefficient indicated that when other variables in the model are controlled, success of Digital Literacy Programme is predicted to improve by 0.175 when communication management goes up by one (Table 4.30). This influence was also stated by a t- value of 5.654 which implies that the standard error associated with the parameter is less than the influence of the parameter. Therefore, there is sufficient evidence to reject the null hypothesis and accept that for each increase in communication management practice, there is 17.5% increase in success of Digital Literacy Programme in Western Kenya.

H_{02}*: There is no significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.*

The results in Table 4.25 indicated that there was a positive and significant correlation between risk management and project success (r=0.631, p=0.000). Simple linear regression indicated there is direct significant influence of risk management on project success (β=0.145, p=0.000). Multiple linear regression unstandardized coefficient indicated that when other variables in the model are controlled, an increase by one percent in risk management is likely to result to an improvement in project success by 14.8%, p=0.015 (Table 4.30). Therefore, there was sufficient evidence to reject the null hypothesis as indicated by findings where $p<0.05$ and $t>1.96$.

H_{03}: *There is no significant relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.*

The results in Table 4.25 indicated that there was a positive and significant correlation between stakeholder management and project success (r=0.574, p=0.000). Simple linear regression indicated there is direct significant influence of stakeholder management on project success (β=0.448, p=0.000). Multiple linear regression unstandardized coefficient

indicated that when other variables in the model are controlled, success of Digital Literacy Programme is predicted to improve by 0.444 when stakeholder management goes up by one (Table 4.30). This influence was also stated by a t- value of 10.350 which implies that the standard error associated with the parameter is less than the influence of the parameter. Therefore, there was sufficient evidence to reject the null hypothesis and accept that for each increase in stakeholder management practices, there is 44.4% increase in success of Digital Literacy Programme in Western Kenya.

H_{04}: *There is no significant relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.*

The results in Table 4.25 indicated that there was positive and significant correlation between scope management and project success (r=0.557, p=0.000). Simple linear regression indicated there is direct significant influence of scope management on project success (β=0.442, p=0.000). Multiple linear regression unstandardized coefficient indicated that when other variables in the model are controlled, success factors of Digital Literacy Programme is predicted to improve by 0.156 when stakeholder management goes up by one (Table 4.30). This influence was also stated by a t- value of 3.903 which implies that the standard error associated with the parameter is less than the influence of the parameter. Therefore, there was enough evidence to reject the null hypothesis and accept that for each increase in scope management practices, there is 15.6% increase in success factors of Digital Literacy Programme in Western Kenya.

H_{05}: *Project Complexity has no significant moderating effect on the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.*

The findings obtained in Table 4.31 (hierarchical regression model) and Table 4.32 (unstandardized coefficients) respectively, revealed that project complexity has a positive and significant moderating relationship between project management practices and success of Digital Literacy Programme. This was indicated by an increase in R^2 value with

a subsequent addition of the independent variables, followed by the moderating variable and finally the interaction terms. The hierarchical regressions table 4.31 also indicated p-values of 0.000 which is less than 0.01 significance level. Therefore, this study rejected the null hypothesis and accepted that the relationship between project management practices and project success can be moderated by project complexity.

From the correlation and regression analysis conducted in the testing, the decisions as presented in Table 4.33 were made on the null hypotheses.

Table 4.34: Results of the Hypothesis Tests

S/No	Hypothesis	Decision
H_{01}	There is no significant relationship between communication management and success factors of Digital Literacy Programme in Western Kenya.	Reject H_{01}
H_{02}	There is no significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya.	Reject H_{02}
H_{03}	There is no significant relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya.	Reject H_{03}
H_{04}	There is no significant relationship between scope management and success factors of Digital Literacy Programme in Western Kenya.	Reject H_{04}
H_{05}	Project Complexity has no significant moderating effect on the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya.	Reject H_{05}

4.9 Optimal Model

A model optimization was carried out based on the data shown in Table 4.32. The purpose of model optimization was to serve as a guide in the process of deriving the final model (the updated conceptual framework), in which for the sake of objectivity, only the significant variables were included. The findings as presented in Table 4.32 were obtained by doing hierarchical regressions analysis. Since each independent variable had a significant effect on the success factors of Digital Literacy Programme, none of them were excluded from the final model.

The variables were arranged in order of significance as follows; stakeholder management, communication management, scope management and finally risk management. Further, the constructs in each of the independent variables were aligned in order of their significance. That is, how best each of the constructs explains the success factors of Digital Literacy Programme. Furthermore, in consideration of the moderating effect of project complexity, communication management practices interaction with project complexity and risk management practices interaction with project complexity were dropped. The Figure 4.16 below shows the contributory linkages of variables for project management practices, project complexity and Success Factors of Digital Literacy Programme. The variables are arranged in terms of their regression coefficients (β) in the optimal model.

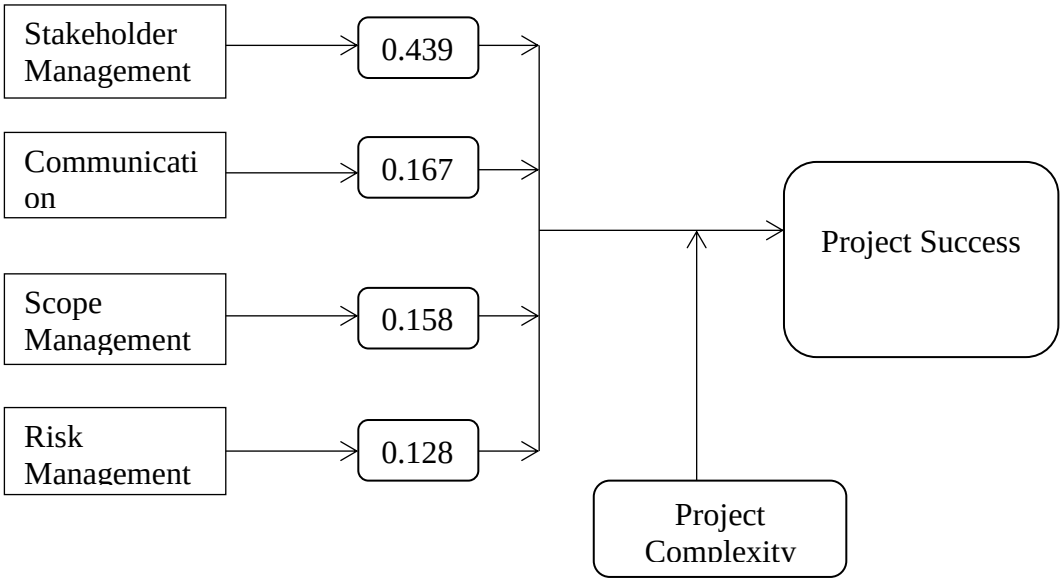

Figure 4.17: Contributory Linkages of Variables for Project Management Practices and Success Factors of Digital Literacy Programme

4.10 Discussion of Results

A closer look at the relationship between the project management practices and project success dimensions, indicates that project management practices are significantly correlated with project is successful if "completed within budget", "completed within

proposed timelines", and "project complied with quality requirements". Correlation analysis also indicated project complexity is linked to the success Digital Literacy Programme. Moderation analysis also indicated project complexity moderates the relationship between project management practices and success factors of Digital Literacy Programme. The findings of the study were discussed in line with the study objectives.

4.10.1 Communication Management and Success Factors of Digital Literacy Programme

The first objective of the study was to assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya. Majority of the respondents agreed that All communications with stakeholders as regard to the project are done in a timely manner and selected people for the project clearly understands the project objectives, benefits, and risks. Results from document analysis also confirmed that schools which had communication management plan in use were likely to have success in implementation of Digital Literacy Programme and therefore effective use of communication management plan increases the success rates of Programme. This finding corroborates that of Zulch (2014) who observed that communications plan should be set up as early as possible in the definition phase of the project lifecycle and adequately updated to ensure timely access to information and quicker making of decisions based on reliable information by project stakeholders. The study concurs with the findings of Čulo and Skendrović (2010), where they reiterate the need for people responsible for effectively communicating to stakeholders, to have a format of project information is accurate, aligned to project goals and timely.

Correlation analysis indicated that the relationship between communication management and success factors of Digital Literacy Programme is positive and significant. This implied that communication management is positive linked to success of DLP. In this regard, regression analysis further revealed that communication management is a significant predicator of success of Digital Literacy Programme an observation which was further supported by multiple linear regression which indicated that communication management

can significantly predict success of DLP in Western Kenya. Regarding communication management, the success of DLP is driven by official standardized methods to guide communication and feedback mechanism for all communication done there, people for the project clearly understands the project objectives, benefits, and risks. The results also showed that communication management was ranked as the fourth most used practice after scope management. This implied that the schools need to put in additional effort into ensuring an efficient communication management practice within the project, and that there is also a good communication link among stakeholders.

The results of this study are consistent with Papke-Shields, Beise, and Quan's (2010) study which found that communication management was not given enough attention in projects, and this affected the performance of the project. This finding is also in commensuration with previous research (Alotaibi, 2019; Fraz *et al.,* 2016; Mavuso & Agumba, 2016; Aiyewalehinmi, 2013; Kleim, Gouder, 2010 & Meid, 2015) who found out that that project communication management positively affects perceived project success. Communications management is significantly correlated with project success, an implication that communication management is a key factor of successful projects. The results reiterate the importance of managing communications plan (identifying stakeholders and developing an appropriate plan for communication needs for them), implementing communications processes (timely and appropriate collection, creation, distribution, storage, and retrieval of project information) and monitoring communications (meeting project information and stakeholders' needs) for a project to be deemed successful.

4.10.2 Risk Management and Success Factors of Digital Literacy Programme

The second objective of the study was to determine the relationship between risk management and success factors of Digital Literacy Programme in Western Kenya. Majority of the respondents agreed that once the project is approved and it moves into the planning stage, risks are identified with each major group of activities to identify increasing levels of detailed risk analysis. Further, during the closeout phase of the

projects, agreements for risk sharing and risk transfer are always concluded, and the risk breakdown structure examined to be sure all the risk events have been avoided or mitigated. The results of this study, to large extent, are in line with the study conducted by Pimchangthong and Boonjing (2017) who found that effective use of risk management tools like in the case of this study (use of risk registers), the lower chances of project failure and higher chance of success. Successful project completion is dependent to a great extent on the early identification of immediate risks which also vary depending on the type and size of the organization as well as the individual ability of the project manager (Urbański, Haque &Oino, 2019). Pimchangthong and Boonjing (2017) assert that while risk management provides project managers with a forward-looking view of both threats and opportunities to improve the project success, studies have shown that risk identification and risk response planning have a positive influence on project success with risk identification having the highest positive influence on product performance, followed closely by risk response.

Correlation analysis indicated risk management is positively linked to the success Digital Literacy Programme. The link was found to be positive and significant implying that increase in Risk management would enhance Success of DLP. Simple linear regression analysis further revealed that risk management is a significant predicator of success of Digital Literacy Programme and a similar outcome was further supported by multiple linear regression which indicated that risk management can significantly predict success of DLP in Western Kenya. To successfully implement Digital Literacy Programme, a risk management plan should be implemented, updated regularly with new information and risks checked off that are related to activities that have been performed. The project team should consider potential risk in the planning phase and weight against the potential benefit of the project's success to decide if the project should be chosen.

The findings corroborate that of (Alotaibi, 2019; Urbański *et al.,* 2019; Pimchangthong & Boonjing, 2017; Roque & Marly, 2013; Musinya, 2011; Peckie, Komaroyska & Ustinovicius, 2013; Fraz *et al.,* 2016) who found out that that there was a significant relationship between project success and the use of project risk management. However,

the findings contradict studies by Didraga (2013) who found out that that risk identification and planning did not influence the subjective performance of the project in terms of reliability, easiness, flexibility, satisfaction, and quality, yet quality is a key factor in determining success of a project. However, while it is true that increased risk may have consequential effects on the cost, time, and use of the completed project (Alotaibi, 2019), there are numerous variables that predict and determine the success of a project. This view is also shared by De Bakkar *et al.* (2010) who posits that the contribution of risk management should be considered in relation to a broader definition of project success.

4.10.3 Stakeholder Management and Success Factors of Digital Literacy Programme

The third objective of the study was to examine the relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya. Majority of the respondents agreed that people selected as stakeholders benefit from projects initiated, the project team members are selected at a point that they have the greatest impact on the project and people selected have requisite skills to handle the project and freely voice their concerns, if need be, before decision are made. Results from document analysis also confirmed that schools which had stakeholder identification register in use were likely to have success in implementation of Digital Literacy Programme and implying stakeholder management practices had been implemented effectively. Few schools had no evidence of stakeholder registers implying that the information needs for various stakeholders and beneficiaries of the projects were not included in the stakeholder analysis register. This finding is consistent with PMI (2013) and O'Halloran (2014) who agree that it is good practice to maintain stakeholder registers for projects and to facilitate easy analysis the type of stakeholder information needs and complement good communication management practices.

Correlation analysis indicated that the relationship between stakeholder management and success factors of Digital Literacy Programme is positive and significant. This implied that stakeholder management is positive related to success of Digital Literacy Programme

and its role cannot be underestimated. In this regard, regression analysis further revealed that stakeholder management is a significant predicator of success of Digital Literacy Programme an observation which was further supported by multiple linear regression which indicated that stakeholder management can significantly predict success of Digital Literacy Programme in Western Kenya. To ensure success of DLP, individuals that handled project had requisite skills and individual selected as stakeholders benefit from projects initiated. The results of this study are hence found to be consistent with past studies undertaken, including: de Oliveira & Rabechini, 2019; Frazet *al.* (2016); Kelbessa (2016); Molwus (2014); Macharia (2013) and Hamma, (2013) who opine that it is vital to find an approach and engagement with project stakeholders if project success is to be achieved. The reason behind this is clear: during project implementation, conflicts or power struggles among stakeholders may arise which could have serious implication on project performance hence project success or failure. The finding also corroborates that of Jepsen and Eskerod (2013) who suggests that project success involves not only the iron triangle factors i.e., cost, time, and quality, but also the effective management of the stakeholders involved.

The study findings affirms previous findings that formulating appropriate strategies to manage stakeholders, building trust between project top management and the most engaged stakeholders in the project, exploring stakeholders needs and constraints in projects, ensuring effective communication for all project stakeholders, identifying stakeholders, promoting a good relationship with stakeholders, understanding the areas of stakeholders interests and prioritizing stakeholders by their power and influence on the project is key to a successful project. This implies that a stakeholder engagement plan should be developed to engage the stakeholders throughout the project's life (Project Management Institute, 2017). Stakeholder engagement needs to be managed as well in all phases of the project life cycle and this entails timely communication and working hand in hand with stakeholders to address issues as they arise (Dagli, 2018).

4.10.4 Scope Management and Success Factors of Digital Literacy Programme

The fourth objective of the study was to establish the relationship between scope management and success factors of Digital Literacy Programme in Western Kenya. Majority of the respondents agreed that change in project activities results to change in Project outcome quality, project cost and project schedule/time. Further they also agreed that during scope planning all key stakeholders were involved. Based on the descriptive results, the study noted that all the project activities identified should be known from the onset of the project. In case there is need to change the project scope, a scope change request form should be filled, analyzed, reviewed, and approved by stakeholders because, changes in project activities can result to change in unbudgeted project costs. There should be a scope management plan in place for easier tracking and measuring critical project achievements (milestones) as the project progresses in line with objectives at every stage of implementation. The results of this study, to large extent, are consistent with the study conducted by Derenskaya (2018) who found out that the process of managing the project scope considers the planning, definition of the project scope, creation of the structure of project work, confirmation of the scope and management of the project scope and that the use a project scope management plan in structure of project work is vital. According to Standish Group (2018), inappropriate definition of project scope is one the factors that led global project failures. This suggestion agrees with the findings of this study as well as Blaskovics (2014) where all the respondents agreed that scope of the project should be defined clearly, and all project activities need to be known at onset of the project. However, these authors also emphasize that the project may be completed within cost and time, but still not meet scope criteria.

Correlation analysis indicated scope management is positively correlated to the success Digital Literacy Programme. The correlation was found to be positive and significant implying that increase in scope management would enhance success of DLP. To establish the causal relationship, simple linear regression analysis revealed that scope management is a significant predicator of success of Digital Literacy Programme and a similar assertion was further supported by multiple linear regression which indicated that scope

management can significantly predict success of DLP in Western Kenya. The findings above are in commensuration with previous research (Abdilahi *et al.,* 2020; Fraz *et al.,* 2016; Madhuri *et al.,* 2018; Nibyiza *et al.,* 2015) which have found out that scope management is significantly correlated with project success and that scope management has a positive influence on project success. Fraz *et al.* (2016) study investigating the effect of scope management on project success; the findings revealed that scope management was significantly correlated with project success in Make-to-Order Organizations. The findings corroborate studies by conducted Cooke-Davies (2010) and Clarke (1999) who further pointed out that failure to manage scope appropriately of the project would result in a higher chance of the project being deemed unsatisfactory among stakeholders and even lead to cancellation of the project given the cost, time, and quality implications. The reasons behind these findings are well captured by Abdilahi *et al.* (2020) who assert that, scope management ensures that a project's scope is accurately defined and mapped enabling project managers to allocate the adequate resources necessary to complete the project within specified schedules as agreed among the stakeholders.

4.10.5 Moderating Role of Project Complexity

The fifth objective of the study was to determine the moderating effect of project complexity on the relationship between the project management practices and success factors of Digital Literacy Programme in Western Kenya. Correlation analysis indicated project complexity is linked to the success factors of Digital Literacy Programme. This implies that project complexity has a role in success of Digital Literacy Programme, a finding consistent with Bosch-Rekveldt *et al.* (2011) who found out that technical, organizational, and environmental factors of complexity negatively influenced performance in a large engineering project.

The findings also corroborate studies by Luo *et al.* (2017) who investigated the connection between project complexity and success in construction projects. The results of the study indicated that project complexity has a negative correlation with project success. Project complexity was measured by focusing on goal, task, and organizational, technological,

environmental, and informational complexities while project success factors were under time, cost, quality, health and safety, environmental performance, participants' satisfaction, user satisfaction and commercial value. The study established that the interaction of project complexity and project management practices significantly predicted project success of DLP. Therefore, the moderating effect of project complexity cannot be ignored during project management.

Project Complexity moderates the relationship between communication management, stakeholder management, scope management and risk management and project success. However, the effect was more pronounced and significant regarding scope management and stakeholder management whereby increase in project complexity would significantly reduce the effect of scope management and stakeholder management in the success of DLP. This implies that indeed bottlenecks during implementation can hold up key processes in stakeholder management and scope management and in some cases, practices meant to enhance project success were not clear with regards to scope and stakeholders' management activities. Further, sub-activities and sub-tasks during execution of the project were diverse and highly unpredictable thus negatively affecting scope management and level of innovation within the project was unpredictable.

On the moderating effect of project complexity on the relationship between communication management and success factors of DLP, the findings were consistent with Afroze and Khan (2017) who found out that project complexity had a minimal impact on the relationship between effective communication and project performance. Studies on moderating effect of project complexity on the relationship between effective stakeholder management and project performance have yielded mixed results. For instance, the positive effects focused on task complexity and organization complexity while negative effects based on information complexity and technological complexity on project success (Luo *et al.,* 2017). In contrast, Floricel *et al*. (2016) study on complexity, uncertainty-reduction strategies, and project performance, found a statistically significant positive effect of interactions (technical complexity and existing knowledge, technical complexity and new knowledge, organization complexity and new knowledge, and market complexity

and new knowledge) on project completion performance. (Aladpoosh, Shaharoun & Saman, (2012) found out that as the number of stakeholders interested in the project increases, so does the complexity of the project therefore complexity has a negative effect on project performance.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the findings, conclusions, recommendations, and contributions of the study to theory, methodology, policy, and practice of project management made by the researcher based on the findings. Lastly, this chapter ends with suggestions for further study areas to help expand or make a review of the current research study.

5.2 Summary

The study aimed at investigating the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya. The independent variables for the study were: communication management, risk management, stakeholder management and scope management. The study also investigated the moderating effect of project complexity on the relationship between project management practices and success factors of Digital Literacy Program (Project Success). The study observed that the project management practices (independent variables) had a significant partial influence in predicting success factors of Digital Literacy Programme in Western Kenya. Communication Management, Risk management, Stakeholder Management and Scope Management which were all significant at 5% level of significance .The constant was also found to be significant, the implication being that ,apart from the four project management practices (Communication Management, Risk Management, Stakeholder Management and Scope Management), there are other variables, not included study model, that are possibly related to success factors of Digital Literacy Programme in Western Kenya, thus paving way for further research to be done in this area. With respect to theories, this study advanced a theoretical argument for the use of Theory of Constraints, Stakeholder Theory, and Complexity theory in Project management. The study advances the theory of constraints by emphasizing on the role of managing project constraints, considering that projects are subject to constraints such as risks, cost, quality, scope, timelines among

others hence its crucial to understand each of the constraints and manage them, if the project is to succeed. The results of the study to large extent, are in line with the theoretical arguments of stakeholder theory which postulates that involvement of stakeholders and management of their needs is paramount for the long-term success of any given project. Stakeholder ultimately determine whether the project is successful or it's a failure hence it's important to manage their interests and empower them to contribute to implementation of the project for ownership reasons. The study also advances complexity theory which suggests that the delivery of projects within budget, timeliness and to agreed quality standards is unpredictable, and therefore the success or failure of projects is also pegged on appropriate management of complexity factors that affect the relationship between best project management practices and success factors of projects. Project managers can minimize uncertainty and risks by defining specific project objectives, managing key stakeholders' expectations, and developing strong communication ties with the beneficiaries to identify potential, foreseeable risks. The study makes vital contributions to the theory and practice of identifying, engaging and empowering project stakeholders (such dependance on other stakeholders like contractors) who may make the execution of the project complex due to diverse interests. Every organization has unique resources which aid it to achieve organizational goals hence the resources must be adequate matched with effective project management practices to ensure better time success, budget success and quality success which are critical success factors for projects.

5.2.1 Communication Management and Success Factors

The first objective of the study sought to assess the relationship between communication management and success factors of Digital Literacy Programme in Western Kenya. The study established that communication management plays a significant role towards achievement of project success. Averagely, the level of communication management practiced by the public primary schools was significantly high indicating communication management practices were significant in determining completion of the Programme within budget, within timeliness and while adhering to quality specifications but had some room for further improvement. This implied that most of the sampled public primary

schools were effective in terms of planning for communications, implementing communication plans, and monitoring communications processes. The study revealed that communication management had a strong positive correlation with success factors of Digital literacy Programme. The regression analysis results indicated that communication management had a significant positive causal and effect relationship with success factors of Digital Literacy Programme in Western Kenya. An improvement in communication management practice was likely to result to improved success of DLP in Western Kenya. The study confirmed that the mains construct of communication management attributed to changes observed in success of DLP in Western Kenya were effective communication planning, implementing communications and monitoring and controlling communications.

5.2.2 Risk Management and Success Factors

The second objective of the study was to determine the relationship between risk management and success factors of Digital Literacy Programme in Western Kenya. The study established that risk management was a significant determinant of success of Digital Literacy Programme. The composite mean for risk management practice was significantly high therefore significant in determining success factors of Digital Literacy Programme but had some room for further improvement. This implied that most of the sampled public primary schools had effective risk identification, analysis and risk response planning and monitoring practices. This was confirmed also via analysis of risk registers though not all schools had them in place and this was noted as an area for improvement. The more effective use of risk management tools in this case risk registers, the higher chance of success. The study revealed that risk management had a strong positive correlation with success factors of Digital Literacy Programme and was the most significant of the project management practices. The regression analysis confirmed that risk management had a significant positive causal and effect relationship with success factors of Digital Literacy Programme in Western Kenya. An improvement in risk management practice was likely to result to improved success of DLP in Western Kenya. The study confirmed that the mains construct of risk management attributed to changes observed in success of DLP in

Western Kenya were effective identification of risks (listing of risks), analysis of risks and risk response and control.

5.2.3 Stakeholder Management and Success Factors

The third objective of the study was to examine the relationship between stakeholder management and success factors of Digital Literacy Programme in Western Kenya. Averagely, the level of stakeholder management practices of the public primary schools in Western Kenya was rated high. An implication that the process implemented in the public primary schools in Kenya to identify key stakeholders, their engagement plan, and empowerment practices were considerably very effective hence possible determinant of the success factors of Digital Literacy Programme in Western Kenya. Analysis of Stakeholder Identification Registers also indicated that majority of the schools had necessary tools to complement the other stakeholder management practices. The correlation results of the study demonstrated a significant relationship between stakeholder management and success factors of Digital Literacy Programme. Despite this relationship, stakeholder management was ranked as the second most common practice of the four practices. Stakeholder identification, stakeholder engagement and stakeholder empowerment were confirmed as the key constructs of stakeholder management that explain for the changes observed in success factors of Digital Literacy Programme in Western Kenya. Regression analysis confirmed a positive and significant causal and effect relationship with success factors of Digital Literacy Programme since an improvement in the Stakeholder Management was likely to result to an improvement in the success of DLP in Western Kenya.

5.2.4 Scope Management and Project Success

The fourth objective of the study was to establish the relationship between scope management and success factors of Digital Literacy Programme in Western Kenya. The composite mean for scope management practices of the public primary schools was rated high, implying that all the processes that define and control the success and

accomplishment of projects were well conducted hence a possible trigger of the success Factors of Digital Literacy Programme. Majority of sampled schools had evidence of using a scope management plan, a tool which documents all the work required and only that work to complete the project successfully. This confirmed that the use of stakeholder management tools in practice was related to completing the Programme on schedule, within budget and within quality specifications in most of the schools. Correlation results indicated scope management practices were positively and significantly related with success factors of Digital Literacy Programme. The regression analysis results also indicated that scope management had a statistically significant influence on the success factors of Digital Literacy Programme in Western Kenya, since an improvement in the scope management was likely to result to an improvement in the success of DLP in Western Kenya. The study demonstrated that collecting project requirement, validating scope changes, and controlling scope have a positive and significant effect on the success factors of Digital Literacy Programme in Western Kenya.

5.2.5 Moderating Effect of Project Complexity

The fifth objective of this study was to determine the moderating role of project complexity on the relationship between the project management practices and success factors of Digital Literacy Programme in Western Kenya. Most the public primary schools sampled in Western Kenya, seemed to agree that the success of Digital Literacy Programme was moderated by complexity factors. Evidence of a Project Complexity Assessment and Management (PCAM) report used to identify, assess, and manage project complexity in the schools indicated that majority of the school indicated that Digital Literacy Programme was less complex. Project Complexity had a significant effect on the relationship between project management practices (communication management, risk management, stakeholder management and scope Management) and success factors of Digital Literacy Programme in Western Kenya. The results of the study indicated that project complexity as moderator was found to be insignificant as indicator with negative regression coefficient implying that project complexity on its own could not significantly predict project success. However, project complexity was found to have a negative effect

on success factors of Digital Literacy Programme in Western Kenya. The interaction effect of project complexity and communication management as well as project complexity and risk management were found to have insignificant negative effect on success factors of Digital Literacy Programme in Western Kenya. The interaction effect of project complexity and stakeholder management was found to be significant implying that an increase in project complexity would result to reduction in the effect of scope management on Success of Digital Literacy Programme in Western Kenya. Similarly, interaction effect of project complexity and stakeholder management was found to be negatively significant implying that an increase in project complexity would result to reduction in the effect of stakeholder management on Success factors of Digital Literacy Programme in Western Kenya. Technical aspects (experience with technology, goals clarity, number of tasks), Organizational aspects (project team size, type and technical skills required) and Environmental aspect (dependencies on the other stakeholders) are the main constructs of project complexity that explain for the changes observed in success factors of Digital Literacy Programme in Western Kenya.

5.3 Conclusions

As per the findings of the study, it can be concluded that all the independent variables in the study were related to dependent variable. The relationship was confirmed through correlation and regression analysis which revealed that there was a positive significant linear relationship between independent variables and dependent variable. All the project management practices had a significant partial influence in predicting success factors of Digital Literacy Programme in Western Kenya. On the relationship between communication management and success factors of Digital Literacy Programme, the study concluded that there was a positive statistically significant relationship that exist between communication management and success factors of Digital Literacy Programme in Western Kenya confirmed by both regression and correlation analysis. The study also concluded that the use of communication management tools such as communication management plan is significant in determining success factors of the Programme. Regarding the relationship between risk management and success factors of Digital

Literacy Programme, the study concluded that there is a positive statistically significant relationship between risk management and success factors of Digital Literacy Programme in Western Kenya, confirmed by both regression and correlation analysis. The study also concluded that the use of risk management tools such as risk register is significant in determining success of the Programme in Western Kenya. The study concluded that stakeholder management practices were related success factors of Digital Literacy Programme in Western Kenya and that improving project management practices would result in higher success rates of the Programme hence a common view of success criteria and understanding of the relationship among the stakeholders. This was confirmed by both regression and correlation analysis which indicated a positive significant cause and effect relationship between Stakeholder Management and success factors of DLP in Western Kenya. The study also concluded that the use of stakeholder management tools such as stakeholder identification register(forms) is significant in determining success of the Programme. Similarly, regression and correlation analysis confirmed that there is positive statistically significant relationship between scope management practices and success factors of Digital Literacy Programme in Western Kenya. Therefore, the study concluded that scope management has a statistically significant influence on the Success Factors of Digital Literacy Programme. The study also concluded that adoption of scope management tools such as scope management plan is significant in determining Success Factors of Digital Literacy Programme. Moderation analysis concluded that project complexity has a negative effect on success factors of Digital Literacy Programme and could be a possible reason for the perceived differences in perception of the deemed success of the Digital Literacy Programme. The study concluded there is a potentially significant moderation effect of project complexity on the relationship between project management practices and success of Digital Literacy Programme in Western Kenya, specifically on the relationship between stakeholder management and success factor and scope management and success factors.

5.4 Recommendations

1. Based on the findings of the study, the researcher recommends that boards of management in the public primary schools should develop policy supporting the standardization of project management practices and project management tools like scope management plan, risk registers, stakeholder registers, communication management plans, monthly project status reports and project complexity assessment management matrices to assist in planning and management of school projects as well as help in measuring critical project achievements. The empirical findings of the study indicate that implementation of project management practices is key to successful implementation of projects and therefore there is need for continuous application of these practices which should be incorporated in project implementation policies in schools.
2. Similarly, based on the findings of the study, the researcher recommends formulation of training policy by ministry of education of all the project team members in public primary schools to ensure that best project management practices are continuously embedded in the school project management policies. The researcher recommends benchmarking for schools that have not implemented the use of project management tools in their management practices. For schools who have adopted best project management practices, the researcher recommends continuous application of the practices to improve success rates of school projects.
3. In addition, the researcher from the study recommends that public primary schools boards of management and education ministry work together to ensure uniformity in project management practices across public primary schools. The findings confirm that uniformity in project management practices across public primary schools would ensure a shared view of success factors for school projects among stakeholders. Success Factors criteria for a project should be determined prior to execution of the project with stakeholders' participation.
4. Regarding the moderation of project complexity on the relationship between project management practices and success factors in Western Kenya, the research

recommends that a clear understanding of project complexity factors is sought because of the differences associated with decision-making and goal attainment that can hinder the clear identification of goals and objectives yet are related to complexity. The project team which involves the school heads should develop a project scope management plan in liaison with all key stakeholders identified. Policy makers should not overlook the impact of project complexity on the relationship between scope management and project success factors, and between stakeholder management and success factors of projects.

5.5 Contribution of Research

This research augments the existing literature which can be grouped according to the methodological and theoretical contributions. The study fills the knowledge gap by using project complexity as a moderator on the relationship between the predictor and the predicted variables used. This research also provides empirical evidence of the relationship between project management practices and success factors in academia. A key element of successful projects is management of complexities in projects. This study is unique in the methodology adopted in terms of the assessment of the interaction of various project management practices and how they have been linked to success factors of Digital Literacy Programme through the moderation of project complexity in Western Kenya. Similarly, the study used a combination of data collection, analysis and procedures which provides a methodological contribution in the field of contemporary management of Project Management through an investigation of the influence of project management practices on success of Digital Literacy Programme. The inclusion of hierarchical regression analyses to investigate the moderating influence of project complexity on the relationship between project management practices and success of Digital Literacy Programme, especially in Western Kenya public schools, provided a key contribution and generation of new knowledge for effective management of projects in public sector projects. Furthermore, this study provided a key contribution and generation of new knowledge taking note that project complexity has a negative significant moderating effect on the relationship between success factors of Digital Literacy Programme and scope management as well as between success factors of Digital Literacy Programme and

stakeholder management. Through analyzing of the primary data obtained from various public primary schools in Western Kenya, the study creates a new insight regarding the relationship between project management practices and success factors of Digital Literacy Programme in Western Kenya. It provides a simple model and illustration on the interaction between the various project management practices and presupposes that institutionalizing best project management practices in public institutions is the single most influencer of project success. Therefore, the public primary school boards of management may find such findings very useful since best project management practices are key components to successful completion of projects.

5.6 Suggestions for Further Research

This study is a milestone for future research in this area due to its findings, particularly in Kenya with regards to adoption of project management practices and its relationship to project success factors. The study provided an insight on the extent of use of different project management practices in public primary schools. The study variables were able to explain 61.8% of the variation in the success factors of Digital Literacy Programme in Western Kenya. This indicates that apart from the four project management practices (communication management, risk management, stakeholder management and scope management), there are other variables, not included in the study model, that could possibly influence success of Digital Literacy Programme (projects) in Kenya, thus paving way for further research to be done in this area.Further study is therefore recommended on the other six project management practices as outlined in Project Management Body of Knowledge not covered by this study which are integration management, time management, resources management, procurement management, cost management and quality management. A more comprehensive study should be conducted to establish the effect of these practices on the success of projects undertaken by public schools and other learning institutions.

This study expands knowledge on the influence of project management practices on success of Digital Literacy Programme in Western Kenya. Though the study has fulfilled

its aim and objectives, and there are a few areas for additional studies and empirical research, given the limitations of the research. On a geographical dimension, this study was primarily limited to public primary schools in Kenya who form the sample size. However, there are a number of other government sponsored projects in both public primary and secondary schools including Kenya Primary Education Development Project (PRIEDE) and Secondary Quality Improvement Project (SEQIP), which this study did not cover but future studies could be undertaken to assess the influence of project management practices on the success of these projects.This study was exclusive to the public primary schools, but all other education and public sectors require project management. Therefore, since the aim of the Government of Kenya is to transform the country into a newly industrialized, middle-income country providing a high quality of life to all its citizens in a clean and secure environment by the year 2030, it is strongly suggested that similar research is undertaken in the public sector comprising of the central government, county governments, development partners and public corporations undertaking the Vision 2030 flagship projects.

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APPENDICES

Appendix I: Letter of Request of Transmittal of Data

20th April, 2019

Muluka K. Ogonji

Jomo Kenyatta University of Agriculture & Technology
College of Human Resource and Development
Cell: 0715189152

TO WHOM IT MAY CONCERN

I am a PhD candidate at the Jomo Kenyatta University of Agriculture & Technology and currently conducting a research as partial requirement for the award of the degree of Doctor of Philosophy in Project Management. My research topic is "Project Management Practices and Success of Digital Literacy Programme in Western Kenya".

The purpose of this letter is to request you to participate as a respondent in this study by completing the attached questionnaire as accurately as possible. All information collected through this exercise will only be used for academic purposes.

Thank you.

Sincerely,

Muluka K. Ogonji

Student Reg. No. HD417/C009/5302/2015

Appendix II: Questionnaire

INTRODUCTION

The purpose of this questionnaire is to gather data on the influence Project Management Practices and success of Digital Literacy Programme in public primary schools in Kenya. Information gathered through this questionnaire will be made available to legitimate and interested stakeholders in the Education Sector to establish the role and metrics of coming up with proper management approach. This questionnaire will not be a test but merely an information exercise. Remember that there are no rights or wrong answers. Please answer all the questions in the spaces provided after each question or by ticking [√] in the appropriate box. Do not write your name on the questionnaire. The information you will give will be treated with a lot of confidentiality.

Demographic Data

Name of School_____

County Kakamega ☐ Bungoma ☐ Busia ☐ Vihiga ☐

Kisumu ☐ Migori ☐ Kisii ☐

Age (years) 18-25 ☐ 26-33 ☐ 34-41 ☐ 42-49 ☐ 50 and Above ☐

Experience (years) 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ Above 20 ☐

SECTION A: Project Management Practices

Please indicate your level of agreement in respect to the following statements as they relate to Digital Literacy Programme.

Please tick **(√)** the option applicable to your statement. Strongly Agree (SA) = 5, Agree (A) =4, Undecided (U) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1.

i. Communication Management	**SD (1)**	**D(2)**	**U(3)**	**A(4)**	**SA(5)**
1. All communications with stakeholders as regard to the project are done in a timely manner					
2. Selected people for the project clearly understand the project objectives, benefits, and risks.					
3. The project manager uses a variety of communication methods to share information among stakeholders such as emails, notes, letters, face to face					
4. Implementation of communication plan has an impact on the project					
5. There are official standardized methods to guide communication among the project team members					
6. All project team members sign off minutes of meetings held noting all deliberations discussed					
7. Project team members have a feedback mechanism for all communication done.					
ii. Risk Management	**SD (1)**	**D (2)**	**U (3)**	**A (4)**	**SA (5)**
8. We have a risk breakdown structure that we normally use to identify potential risk for mitigation					
9. Workshops are normally organized for risk evaluation to determine high-impact risks, which can help narrow the focus on a few critical risks that require mitigation.					
10. After the risk has been identified and evaluated, the project team develops a risk mitigation plan to reduce the impact of an unexpected event					
11. The project team often develops an alternative method for accomplishing a project goal when a risk event has been identified that may frustrate the accomplishment of that goal.					
12. The project team always considers potential risk in the planning phase and weight against the potential benefit of the project's success in order to decide if the project should be chosen.					
13. Once the project is approved and it moves into the planning stage, risks are identified with each major group of activities to identify increasing levels of detailed risk analysis.					
14. In the project implementation phase of the projects, risk plan is always updated with new					

information and risks checked off that are related to activities that have been performed.					
15. During the closeout phase of the projects, agreements for risk sharing and risk transfer is always concluded, and the risk breakdown structure examined to be sure all the risk events have been avoided or mitigated.					
iii. Stakeholder Management	**SD (1)**	**D (2)**	**U (3)**	**A (4)**	**SA (5)**
16. People selected as stakeholders benefit from projects initiated.					
17. The project team members are selected at a point that they have the greatest impact on the project.					
18. The project team or organization selected holds a position from which they can influence the project.					
19. People selected have requisite skills to handle the project and freely voice their concerns, if need be, before decision are made.					
20. People selected as stakeholders had competing agendas which were not revealed at the start of the project.					
iv. Scope Management	**SD (1)**	**D (2)**	**U (3)**	**A (4)**	**SA (5)**
21. All the project activities identified are known from the onset of the project.					
22. Change in project activities results to change in Project outcome quality					
23.In case there is need to change the project scope, a scope change request form is filled, analyzed, reviewed, and approved by stakeholders.					
24. Change in project activities results to change in Project cost					
25. Change in project activities results to change in Project schedule/time					
26. The project team assesses availability of all the resources needed (materials, cost and time and skilled human resource) before executing the project					
27. There is a clear way of tracking and measuring critical project achievements (milestones) as the project progresses in line with objectives at every stage of implementation.					

SECTION B: Project Success

Please indicate your level of agreement in respect to the following statements as they relate to success factors of the Digital Literacy Programme that you're a stakeholder.

Please tick **(√)** the option applicable to your statement. Strongly Agree (SA) = 5, Agree (A) =4, Undecided (U) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1.

Project Success	**SD (1)**	**D (2)**	**U (3)**	**A (4)**	**SA (5)**
28. Project completed within planned budget contributes to project success					
29. It is important to achieve the quality standards mentioned in the specifications for a successful project					
30. Project is successful if completed within proposed timelines.					
31. It is important to comply with technical specifications for project success					

Source: Akbar & Shahid (2023)

SECTION C: Project Complexity

Please indicate your level of agreement in respect to the following statements as they relate to project complexity

Please tick **(√)** the option applicable to your statement. Strongly Agree (SA) = 5, Agree (A) =4, Undecided (U) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1.

Project Complexity	**SD (1)**	**D (2)**	**U (3)**	**A (4)**	**SA (5)**
32. The planned project resources were in adequate to complete tasks					
33. Bottlenecks during execution of the project held up key processes					
34.There was sufficient technology which made management of the project easy and up to date.					
35. Processes or methods to achieve the project goals were unclear.					
36.Key risks were not identified early enough and when triggered, were not managed productively.					

37. The project team members numbers was sufficient for this kind of a project.					
38.Sub-activities and sub-tasks during execution of the project were diverse and highly unpredictable.					
39.Level of innovation within the project was unpredictable and required hiring external consultants.					

Appendix III: Document Analysis Form

Name of public primary school _____						
	Communication Management Plan	**Weekly/ Monthly Status reports**	**Risk Register**	**Scope Management Plan**	**Stakeholders Identification Form**	**Project Complexity Assessment and Management (PCAM) Report**
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

Appendix IV: Sample Distribution and Sample Size Determination

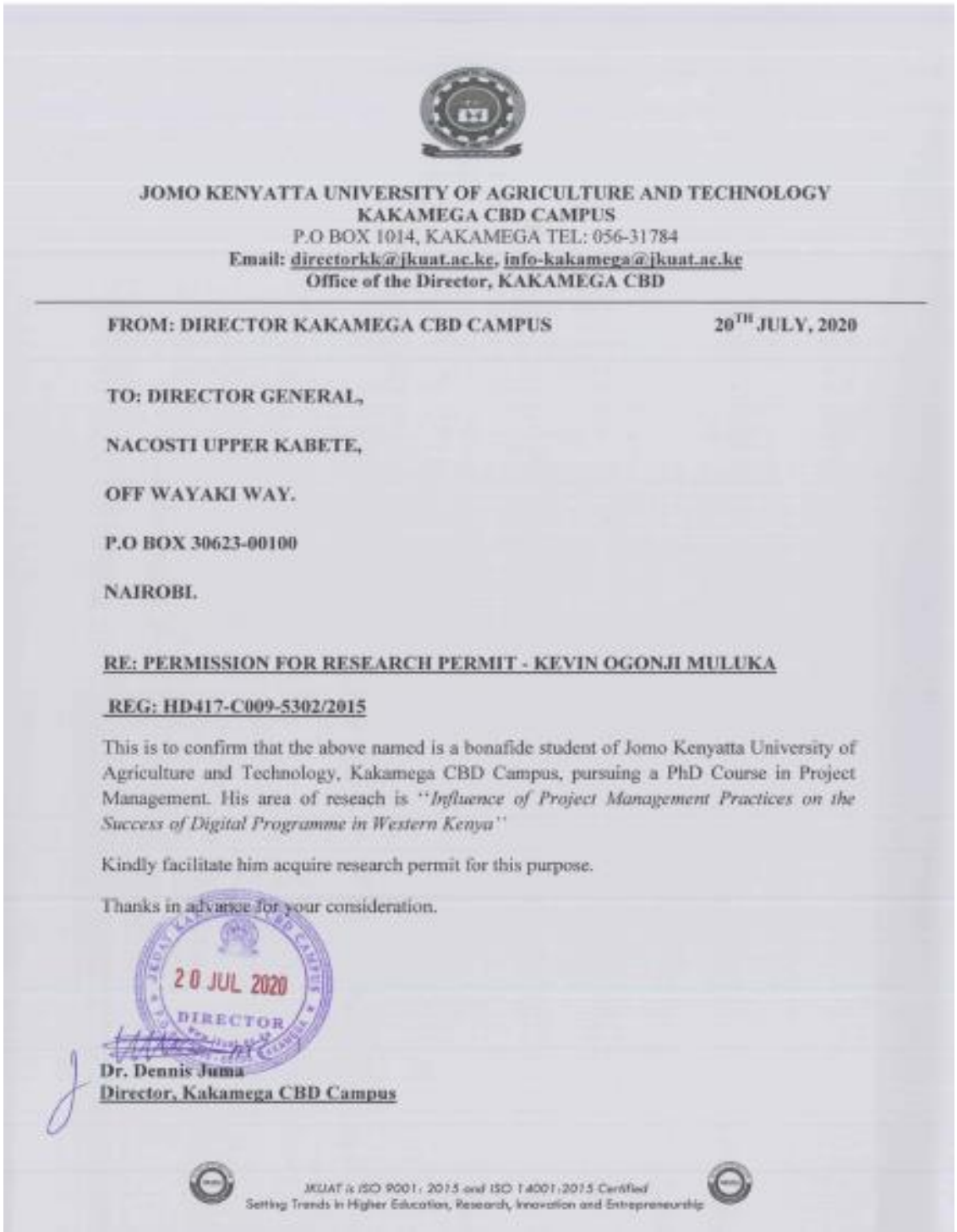
Table for Determining Sample Size of a Known population									
N	**S**	**N**	**S**	**N**	**S**	**N**	**S**	**N**	**S**
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	354	175	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	42	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	354
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

***Note**: **N** is Population size; **S** is Sample size*

This table is for Sample size of Finite Population

Source: Krejcie & Morgan (1970)

Appendix V: Permission for Research Permit



JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
KAKAMEGA CBD CAMPUS
P.O BOX 1014, KAKAMEGA TEL: 056-31784
Email: directorkk@jkuat.ac.ke, info-kakamega@jkuat.ac.ke
Office of the Director, KAKAMEGA CBD

FROM: DIRECTOR KAKAMEGA CBD CAMPUS 20TH JULY, 2020

TO: DIRECTOR GENERAL,

NACOSTI UPPER KABETE,

OFF WAYAKI WAY.

P.O BOX 30623-00100

NAIROBI.

RE: PERMISSION FOR RESEARCH PERMIT - KEVIN OGONJI MULUKA

REG: HD417-C009-5302/2015

This is to confirm that the above named is a bonafide student of Jomo Kenyatta University of Agriculture and Technology, Kakamega CBD Campus, pursuing a PhD Course in Project Management. His area of reseach is *"Influence of Project Management Practices on the Success of Digital Programme in Western Kenya"*

Kindly facilitate him acquire research permit for this purpose.

Thanks in advance for your consideration.

20 JUL 2020
DIRECTOR

Dr. Dennis Juma
Director, Kakamega CBD Campus

JKUAT is ISO 9001: 2015 and ISO 14001:2015 Certified
Setting Trends in Higher Education, Research, Innovation and Entrepreneurship

Appendix VI: Research Clearance Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: 470142

Date of Issue: 22/July/2020

RESEARCH LICENSE

This is to Certify that Mr.. KEVIN OGONJI MULUKA of Jomo Kenyatta University of Agriculture and Technology, has been licensed to conduct research in Bungoma, Busia, Kakamega, Vihiga on the topic: INFLUENCE OF PROJECT MANAGEMENT PRACTICES ON SUCCESS OF DIGITAL LITERACY PROGRAM-ME IN WESTERN KENYA for the period ending: 22/July/2021.

License No: NACOSTI/P/20/5917

470142

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

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Appendix VII: Sampled Primary Schools Per County

County	School	Teacher	Learner	Hard Disk	Routers	Projectors
Migori	Gada	2	67	1	1	1
Migori	Got Ogwamrondo	2	52	1	1	1
Migori	Anindo	2	85	1	1	1
Migori	Aora Jope	2	58	1	1	1
Migori	Awendo	2	65	1	1	1
Migori	Obama	2	75	1	1	1
Migori	Kokuro	2	50	1	1	1
Migori	Komolorume	2	44	1	1	1
Migori	Lianda	2	42	1	1	1
Migori	Kokore	2	27	1	1	1
Migori	Bondo Otuchi	2	40	1	1	1
Migori	Ombo-Kware	2	20	1	1	1
Migori	Ranjira	2	47	1	1	1
Migori	Kehancha	2	90	1	1	1
Migori	Komomange	2	88	1	1	1
Migori	Igena	2	67	1	1	1
Migori	St. Kizito	2	125	1	1	1
Migori	Wizara	2	80	1	1	1
Migori	Wizara School For Mh	2	52	1	1	1
Migori	Karosi	2	62	1	1	1
Migori	Kebobono	2	25	1	1	1
Migori	Gwikonge	2	70	1	1	1
Migori	Robarisia	2	55	1	1	1
Migori	Nyaigutu	2	68	1	1	1
Migori	Migori Muslim	2	101	1	1	1
Migori	Nyamware	2	84	1	1	1
Migori	Nyangubo	2	97	1	1	1
Migori	Witharaga	2	86	1	1	1
Migori	Ochieng'orwa	2	84	1	1	1
Migori	Nyamunda	2	103	1	1	1
Migori	Milimani	2	53	1	1	1
Migori	Ngege	2	72	1	1	1
Migori	Asar Johansson	2	50	1	1	1
Migori	Lwala	2	61	1	1	1
Migori	St. Theresa Rapogi Girls Boarding	2	73	1	1	1
Migori	Luoro	2	65	1	1	1
Migori	Thim Jope	2	73	1	1	1
Migori	Oruba	2	65	1	1	1
Migori	Wi Kodongo	2	54	1	1	1
Migori	Manyonge	2	59	1	1	1
Migori	Nyakuruma	2	43	1	1	1
	Total	**41**				
Kisii	Marongo Pag	2	62	1	1	1
Kisii	Nyabiosi M	2	44	1	1	1
Kisii	Emesa Dsc	2	85	1	1	1

Kisii	Gesonso D.O.K	2	24	1	1	1
Kisii	Nyakorere Pag	2	35	1	1	1
Kisii	Rianyamari D.O. K	2	46	1	1	1
Kisii	Nyabisase D.E.B Nyamarambe	2	50	1	1	1
Kisii	Nyakembene	2	50	1	1	1
Kisii	Igare D.E. B	2	38	1	1	1
Kisii	Kiareni Elck	2	96	1	1	1
Kisii	Maroma D.E. B	2	48	1	1	1
Kisii	Rikenye D.O. K	2	70	1	1	1
Kisii	Nyansaga D.E. B	2	60	1	1	1
Kisii	Getionko Ii S.D. A	2	50	1	1	1
Kisii	Getionko II S.D. A	2	50	1	1	1
Kisii	Marani D.O.K	2	85	1	1	1
Kisii	Maagonga D.O.K	2	68	1	1	1
Kisii	Isanta D.E.B	2	58	1	1	1
Kisii	Igoma Pag	2	62	1	1	1
Kisii	Turwa D.O.K	2	33	1	1	1
Kisii	Riambase D.E.B	2	51	1	1	1
Kisii	Kiobegi D.E.B	2	45	1	1	1
Kisii	Riamangerere	2	65	1	1	1
Kisii	Bokinibanto D.E.B	2	67	1	1	1
Kisii	Nyaineke D.E.B	2	57	1	1	1
Kisii	Nyamaruma D.E.B	2	36	1	1	1
Kisii	Nyambunwa D.E.B Nyamache	2	37	1	1	1
Kisii	Nyamware D.E.B	2	26	1	1	1
Kisii	Kionyo D.E.B	2	40	1	1	1
Kisii	Masisi D.E.B	2	26	1	1	1
Kisii	Mokonge	2	31	1	1	1
Kisii	Bobaracho D.O.K	2	113	1	1	1
Kisii	Kisii Campus D.E.B	2	128	1	1	1
Kisii	Nyamage D.O.K	2	62	1	1	1
Kisii	Nyambera D.O.K	2	82	1	1	1
Kisii	Kari D.E.B	2	105	1	1	1
Kisii	Daraja Mbili D.E.B	2	56	1	1	1
Kisii	Kianyabinge D.O.K	2	54	1	1	1
Kisii	Kiomakondo D.O.K	2	52	1	1	1
Kisii	Kionganyo Mlimani D.O.K	2	25	1	1	1
Kisii	Ichuni Boys D.O.K	2	49	1	1	1
Kisii	Kemuga D.O.K	2	70	1	1	1
Kisii	Riamakanda D.E.B	2	55	1	1	1
Kisii	Rianyoka S.D.A	2	55	1	1	1
Kisii	Nyankoba Community	2	20	1	1	1
Kisii	Ichuni Girls D.O.K	2	45	1	1	1
Kisii	Gesabakwa S.D.A	2	32	1	1	1
Kisii	Chitago C.C.	2	52	1	1	1
Kisii	Amasege S.D.A	2	38	1	1	1
	Total	**49**				
Kisumu	Mbeme	2	82	1	1	1

Kisumu	Rae-Kanyaika	2	86	1	1	1
Kisumu	St. Mark Nyabera	2	112	1	1	1
Kisumu	Nyamasaria	2	99	1	1	1
Kisumu	Ogango	2	72	1	1	1
Kisumu	Kibos	2	38	1	1	1
Kisumu	Oyola	2	40	1	1	1
Kisumu	Ragumo	2	54	1	1	1
Kisumu	Rarieda Kaloo	2	79	1	1	1
Kisumu	Tido	2	50	1	1	1
Kisumu	Kanyamony	2	56	1	1	1
Kisumu	Ngege	2	35	1	1	1
Kisumu	Tiengre	2	77	1	1	1
Kisumu	Usoma	2	53	1	1	1
Kisumu	Ogongo	2	33	1	1	1
Kisumu	Okore Ogonda	2	66	1	1	1
Kisumu	Dr. Robert Ouko	2	59	1	1	1
Kisumu	Kanyamedha	2	137	1	1	1
Kisumu	Kirembe	2	52	1	1	1
Kisumu	Kisian	2	72	1	1	1
Kisumu	Kodiaga	2	80	1	1	1
Kisumu	Kasuna	2	80	1	1	1
Kisumu	Kosida	2	54	1	1	1
Kisumu	Bunde	2	65	1	1	1
Kisumu	Onjiko Kobongo	2	53	1	1	1
Kisumu	Bonde	2	35	1	1	1
Kisumu	Ngutu	2	110	1	1	1
Kisumu	Nyamgun	2	54	1	1	1
Kisumu	Obola	2	46	1	1	1
Kisumu	Oruga	2	32	1	1	1
Kisumu	Milugo	2	42	1	1	1
Kisumu	Rachilo	2	16	1	1	1
Kisumu	Otenga	2	23	1	1	1
Kisumu	Pap-Othany	2	36	1	1	1
Kisumu	Odienya Kagayi	2	34	1	1	1
Kisumu	Diemo	2	50	1	1	1
Kisumu	Bolo	2	22	1	1	1
Kisumu	Katito	2	42	1	1	1
Kisumu	Kodingo	2	30	1	1	1
Kisumu	Lisana	2	30	1	1	1
Kisumu	Nyabondo	2	38	1	1	1
Kisumu	Oroba	2	89	1	1	1
Kisumu	Kibigori Rail	2	50	1	1	1
	Total	**43**				
Vihiga	Chango	2	62	1	1	1
Vihiga	Chavugami	2	51	1	1	1
Vihiga	Ikumba	2	71	1	1	1
Vihiga	Kidundu	2	48	1	1	1
Vihiga	Vihiga	2	65	1	1	1
Vihiga	Womulalu	2	48	1	1	1
Vihiga	Womulalu Friends Special School	2	10	1	1	1

Vihiga	Matsigulu	2	44	1	1	1
Vihiga	Lwang'elle	2	33	1	1	1
Vihiga	Kegendirova	2	34	1	1	1
Vihiga	Ebukhaya	2	70	1	1	1
Vihiga	Ebusiloli	2	106	1	1	1
Vihiga	Ebusiratsi C/G	2	63	1	1	1
Vihiga	Ematsuli	2	95	1	1	1
Vihiga	Emmukunzi	2	105	1	1	1
Vihiga	Ilungu	2	102	1	1	1
Vihiga	Mukhombe	2	110	1	1	1
Vihiga	Mundichiri	2	38	1	1	1
Vihiga	Elununi	2	54	1	1	1
Vihiga	Chebunaywa	2	92	1	1	1
Vihiga	Mungavo	2	137	1	1	1
Vihiga	Shivembe	2	58	1	1	1
Vihiga	St. E. Erusui Girls	2	63	1	1	1
Vihiga	Itovo P.A.G	2	32	1	1	1
Vihiga	Kisasi	2	81	1	1	1
Vihiga	Jinjini	2	43	1	1	1
Vihiga	Shamakhokho	2	45	1	1	1
	Total	**27**				
Kakamega	Tande	2	47	1	1	1
Kakamega	Timbito	2	81	1	1	1
Kakamega	Mukongolo	2	76	1	1	1
Kakamega	A.C.L Shikokhwe	2	60	1	1	1
Kakamega	Chombeli	2	60	1	1	1
Kakamega	Emusali 'K'	2	52	1	1	1
Kakamega	Lunyinya	2	137	1	1	1
Kakamega	Kakunga	2	114	1	1	1
Kakamega	Matende 'K'	2	94	1	1	1
Kakamega	Lukume	2	75	1	1	1
Kakamega	Lusumu 'K'	2	52	1	1	1
Kakamega	Mahira	2	60	1	1	1
Kakamega	Ifwetere	2	60	1	1	1
Kakamega	Imbiakhalo	2	105	1	1	1
Kakamega	Ingavira	2	117	1	1	1
Kakamega	Ingwe	2	96	1	1	1
Kakamega	Chevoso	2	70	1	1	1
Kakamega	Chiliva	2	45	1	1	1
Kakamega	Muting'ong'o	2	66	1	1	1
Kakamega	Mayuge	2	114	1	1	1
Kakamega	Mukhonje 'K'	2	81	1	1	1
Kakamega	Shamoni	2	79	1	1	1
Kakamega	Malimali	2	54	1	1	1
Kakamega	Bulupi	2	80	1	1	1
Kakamega	Sawawa	2	57	1	1	1
Kakamega	Shamberere	2	86	1	1	1
Kakamega	Matioli 'K'	2	74	1	1	1
Kakamega	Bukhakunga	2	102	1	1	1
Kakamega	Shihome	2	107	1	1	1
Kakamega	Ebubole	2	116	1	1	1

Kakamega	Emakhwale	2	133	1	1	1
Kakamega	Enyapora	2	102	1	1	1
Kakamega	Indangalasia A/C	2	106	1	1	1
Kakamega	Mumias Central	2	201	1	1	1
Kakamega	Mumias Complex	2	145	1	1	1
Kakamega	Mumias Muslim	2	134	1	1	1
Kakamega	Mwitoti	2	162	1	1	1
Kakamega	St. Annes Girls Mumias	2	90	1	1	1
Kakamega	St. Peter's Boys Mumias	2	98	1	1	1
Kakamega	Ebwaliro	2	184	1	1	1
Kakamega	Ekambara	2	90	1	1	1
Kakamega	Eluche	2	80	1	1	1
Kakamega	Emachina	2	25	1	1	1
Kakamega	Ebubaka	2	99	1	1	1
Kakamega	Ichinga Muslim	2	156	1	1	1
Kakamega	Kamashia	2	70	1	1	1
Kakamega	Eshikufu	2	78	1	1	1
Kakamega	Lureko	2	129	1	1	1
Kakamega	Matawa	2	119	1	1	1
Kakamega	Mumias Township	2	125	1	1	1
Kakamega	Musango	2	91	1	1	1
Kakamega	Nyakwaka Muslim	2	71	1	1	1
Kakamega	Shanderema	2	114	1	1	1
Kakamega	Shibale	2	95	1	1	1
Kakamega	Mumias Deaf	2	0	1	1	1
Kakamega	Eregi Mixed	2	71	1	1	1
Kakamega	Imalaba	2	76	1	1	1
Kakamega	Iremele	2	122	1	1	1
Kakamega	Ishieywe	2	51	1	1	1
Kakamega	Lubambo	2	83	1	1	1
Kakamega	Madivini	2	111	1	1	1
Kakamega	Iguhu	2	49	1	1	1
Kakamega	Iluya	2	56	1	1	1
Kakamega	Ibuka	2	59	1	1	1
	Total	**64**				
Busia	Bubango	2	94	1	1	1
Busia	Budalang'i	2	134	1	1	1
Busia	Bulemia	2	81	1	1	1
Busia	Lunyofu	2	130	1	1	1
Busia	Port Victoria	2	181	1	1	1
Busia	Bukoma	2	106	1	1	1
Busia	Nanjomi	2	69	1	1	1
Busia	Ruambwa	2	60	1	1	1
Busia	Rugunga Special	2	11	1	1	1
Busia	St Joseph Busia	2	141	1	1	1
Busia	Burumba	2	136	1	1	1
Busia	Bukalama	2	155	1	1	1
Busia	Bulanda	2	180	1	1	1
Busia	Esikulu	2	118	1	1	1
Busia	Esirisia	2	160	1	1	1
Busia	Mabale	2	122	1	1	1

Busia	Mayenje	2	75	1	1	1
Busia	Mujuru	2	126	1	1	1
Busia	Elwanikha	2	80	1	1	1
Busia	Madende	2	92	1	1	1
Busia	Madibo	2	98	1	1	1
Busia	Sikinga	2	120	1	1	1
Busia	Musokoto D.E.B	2	61	1	1	1
Busia	A.C.K Chamasari	2	63	1	1	1
Busia	A.C.K Changara	2	56	1	1	1
Busia	Akobwait (Cha)	2	55	1	1	1
Busia	Moding	2	76	1	1	1
Busia	Okimaru	2	68	1	1	1
Busia	S.A. Kolanya Girls Boarding	2	32	1	1	1
Busia	Kolanya Boys	2	28	1	1	1
Busia	Kongololo	2	43	1	1	1
	Total	**31**				
Bungoma	Khachonge R.C	2	100	1	1	1
Bungoma	Mukhweya R.C	2	120	1	1	1
Bungoma	Pongola F.Y.M	2	72	1	1	1
Bungoma	Sirare R.C	2	110	1	1	1
Bungoma	Chebunyinyi A.C.K	2	45	1	1	1
Bungoma	Kisiwa R.C	2	79	1	1	1
Bungoma	Musokho F.Y.M	2	70	1	1	1
Bungoma	Nakitumba S.A	2	80	1	1	1
Bungoma	Nalondo C.B.M Special P.H	2	21	1	1	1
Bungoma	Sikusi R.C	2	91	1	1	1
Bungoma	Sitila F.Y.M	2	75	1	1	1
Bungoma	Nairumbi S.A	2	95	1	1	1
Bungoma	A.C.K Namosi	2	120	1	1	1
Bungoma	Chekulo F.Y.M	2	192	1	1	1
Bungoma	Lurende R.C	2	83	1	1	1
Bungoma	Luuya R.C	2	110	1	1	1
Bungoma	Mabanga R.C	2	82	1	1	1
Bungoma	Namilama D.E.B	2	98	1	1	1
Bungoma	Chekulo Baptist	2	35	1	1	1
Bungoma	Kiboochi R.C	2	62	1	1	1
Bungoma	Bwake	2	60	1	1	1
Bungoma	Nalondo R.C	2	39	1	1	1
Bungoma	Namakhele R.C	2	94	1	1	1
Bungoma	Nangili R.C	2	62	1	1	1
Bungoma	Nangwe R.C	2	62	1	1	1
Bungoma	Nasaka R.C	2	49	1	1	1
Bungoma	Mikayu M.F.K	2	76	1	1	1
Bungoma	Sikata R.C	2	78	1	1	1
Bungoma	Misiri R.C	2	58	1	1	1
Bungoma	Ngalasia A.C.K	2	35	1	1	1
Bungoma	Sichei R.C	2	120	1	1	1
Bungoma	Khatiri S.A	2	62	1	1	1
Bungoma	Marobo F.Y.M	2	43	1	1	1

Bungoma	Bituyu F.Y.M	2	152	1	1	1
Bungoma	Kimilili D.E.B	2	90	1	1	1
Bungoma	Lwanda S.A	2	133	1	1	1
Bungoma	Matili F.Y.M	2	100	1	1	1
Bungoma	Kimilili R.C Boys	2	95	1	1	1
Bungoma	Kimilili R.C Girls	2	85	1	1	1
Bungoma	Maeni F.Y.M	2	106	1	1	1
Bungoma	Makhonge F.Y.M	2	70	1	1	1
Bungoma	Buko R.C	2	120	1	1	1
Bungoma	Chelekei Bahai	2	130	1	1	1
Bungoma	Kamasielo F.Y.M	2	108	1	1	1
Bungoma	Kambini C.C	2	140	1	1	1
Bungoma	Chebombai D.E.B	2	76	1	1	1
Bungoma	Kapchebon F.Y.M	2	80	1	1	1
Bungoma	Kaptama F.Y.M	2	74	1	1	1
Bungoma	Kaboywo F.Y.M	2	82	1	1	1
Bungoma	Kostoy	2	30	1	1	1
Bungoma	Sirgoi	2	51	1	1	1
Bungoma	Tulwo	2	41	1	1	1
Bungoma	Cherongos D.E.B	2	27	1	1	1
	Total	53				
	Grand Total	**308**				