

# **PROJECT MANAGEMENT AND IMPLEMENTATION OF PUBLIC PROJECTS IN TECHNICAL, INDUSTRIAL, VOCATIONAL AND ENTREPRENEURSHIP TRAINING INSTITUTES IN NAIROBI COUNTY, KENYA**

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## **ABSTRACT**

The purpose of this study was to examine the critical performance factors influencing public projects implementation in TIVET institutions in Nairobi County, Kenya. Specifically, the study sought to examine the influence of project planning, project feasibility, government support and project monitoring and control on public projects implementation in TIVET institutions in Nairobi County, Kenya. This study used descriptive research design and simple random sampling technique to obtain 126 respondents from 18 public and TVETA accredited institutions consisting of the principals, heads of departments and sections. A structured questionnaire was used to collect the relevant information from the respondents. Qualitative analysis was used to analyze qualitative data while inferential and descriptive statistics were used to analyze the quantitative data. Descriptive statistics included mean, standard deviation, frequency and percentages. In relation to inferential statistics, the study used correlation and regression analysis to establish the relationship between the independent and the dependent variables. The study concluded that there is a positive

relationship between project planning, project feasibility, government support and project monitoring and successful public project implementation. Thus, every added unit in the four variables will result into an increase in successful public project implementation. This means that the four predictor variables are useful for predicting the successful implementation of public projects in TIVET institutions. The study recommended that TIVET institutions should ensure that all tasks relating to public projects are properly planned and scheduled to appropriately inform the project financing. The administration of TIVET institutions should ensure that all public projects in their institutions are designed along clear, broad, flexible and favourable legal framework and environment for success. Project monitoring and control should be periodic to ensure timely availability of reports of all the significant project milestones and also coordinate the internal monitoring and evaluation of the supply chain function in respect to the project being undertaken.

**Key Words:** *project management, implementation, public projects, technical, industrial, vocational and entrepreneurship training institutes, Nairobi County, Kenya*

## **INTRODUCTION**

Technical Industrial Vocational and Entrepreneurship Training (TIVET) plays a definite role in the development of people and their nations at large. Kadzo (2011) cited TIVET as one of the most important integral part of economic growth as an indicator and an instrument of development. It increases labour productivity in both urban and rural sectors and economic returns to investment in education are typically high. The importance of TIVET has in recent

years forced governments across the world to not only allocate resources to education but also overhaul educational reforms so as to match with the fast rate of globalization (Ajayi, 2009).

The aim of TIVET is to contribute to both equity and access to training and social responsibility by stimulating competitiveness and entrepreneurship to comprehend life-long learning concepts (Masson & Fretwell, 2009; Munro, 2007). Such concepts are expected to reduce the number of the unemployed youths who otherwise lack the necessary skills for employment. According to Tezci (2011), skills development through training in technical, vocational and entrepreneurship skills enables the country address the problem of youth unemployment. Rodgers & Boyer (2006) posit that TIVET encompasses on-the-job training, apprenticeships, vocational secondary schools, sector-specific institutions, and vocational pathways within comprehensive schools. These aspects serve as a practical and effective ways of skills upgrading. Graduates with job-specific skills have a higher potential of being more productive and more equipped to execute tasks for which they have been trained (Rodgers & Boyer, 2006).

In Germany, TIVET is a training system that is mainly employer-driven (Hippach-Schneider et al., 2007). It emphasizes on continuing education that is action-oriented, practice-oriented and application-oriented. In Canada and Australia, Golding et al. (2009) acknowledge that 70% of all skill training takes place at the workplace in a wide range of social settings such as the home, worksites, and leisure and community activities. In Portugal, TIVET has contributed to occupational integration, raising income levels and expanding opportunities for employment (Budría & Telhado-Pereira, 2009). Countries like South Korea, Taiwan and Japan have been reported to invest highly in vocational school systems to address challenges brought about by a scarcity of skilled workers (Tilak, 2003). In particular, these countries have introduced stringent quotas and entrance examinations to limit university enrolment figures and encourage enrolment in the TIVET system. As a result, they have had accelerated industrial and economic growth, due to a vibrant, skilled middle-level workforce.

In many African countries, the labour market dynamics have expanded training purposes from being economic to embracing social imperatives, including those of fighting poverty and employing the youth (Johanson & Adams, 2004). In Zimbabwe, TIVET has been found to play an important role in providing skills necessary for improved workers' productivity and economic competitiveness (Bennell, 2000). In Sub-Saharan Africa, formal education and work experience has been reported to enhance employers' and owners' methods of production, product quality, conveying quality information to the users, identifying markets and managing human and other resources (Sonobe et al., 2011).

Various studies and policy documents indicate that over 70% of skill training for the small scale business sector in Kenya takes place at the workplace, usually through apprenticeship training in various TIVET centres (Barasa & Kaabwe, 2001; Bowen et al., 2009; Wachira et al., 2009; UNDP, 2010). As evidenced above, TIVET for relevant skills development is an intergral part in

the development of a nation and the world at large. As such, it is an important part of the educational reform structure especially in the Less Developed Countries (LDCs) in Sub-Sahara Africa and Kenya in particular. This study seeks to contribute to the literature in the area of TIVET by focusing on the challenges faced during the implementation of public projects in TIVET institutions in Nairobi County, Kenya.

## **Project Management**

A project is an investment activity encompassing a current or future outlay of funds in the expectation of futuristic benefits (Chandra, 2010). Brown and Hyer (2010) define a project as a temporary endeavor intended to solve a problem, seize an opportunity, or respond to a mandate. All types of organizations engage in project activities including families, government agencies, small businesses and multinational corporations. Harrison (2002) views a project as a non-routine, non-repetitive, one-off undertaking, normally with discrete time, financial and technical performance goals. He adds that projects are systems involving the coordination of a number of separate department entities throughout the organization and which must be completed within prescribed schedules and time constraints.

## **Public Projects and Implementation**

Barasa (2014) defines a public project as one where such an investment involves the use of public funds by a Government body mandated to carry out certain specific missions to achieve specific objectives for the benefit of the greater public majority. Examples of public projects include investment in a public transport system like construction of a new railway line or expansion of the existing railway infrastructure, development of public housing, research and development and training, street repair, street lighting, public parking and services for homeless people (Brown and Hyer, 2010). Public projects can be categorized as strategic investments geared towards addressing long-term goals with a significant impact on the overall direction of the concerned public entity, or short-term tactical investments that implement a current strategy. The sole purpose of public projects is to generate benefits over a period of time (Chandra, 2010).

Project implementation is the process of actualizing the investment plan (Chandra, 2010). This is achieved by putting certain specific actions and structures in place in order to operationalize the investment dream and derive the set project benefits. Wiley (2005) defines project management as an organized venture for managing projects. The process involves scientific application of modern tools and techniques in planning, financing, implementing, monitoring, controlling and coordinating unique activities or tasks to produce desirable outputs in accordance with the pre-determined objectives within the constraints of time and cost. According to Chandra (2010), project management consists of the following core stages: project planning; project scheduling; and project implementation, controlling and project monitoring and evaluation.

The importance of acquiring knowledge on management and implementation of public projects can be viewed from three perspectives. First, the projects' long-term effects in so far as the future character of the public organization will largely be determined by the current projects being undertaken today. Second, their irreversibility given that a wrong project decision often cannot be reversed without incurring a substantial loss. Third, projects' substantial financial outlays. Since capital projects usually involve enormous resource outlays, Chandra (2010) proposes the need for effective project implementation to avert the probable losses. Brown and Hyer (2010) argue that the attention to the management of projects undoubtedly is growing because organizations, whether private or public, have up-scaled their project portfolios and consequently spend large sums of money on project endeavors.

### **TIVET Projects in Kenya**

The TVET projects form part of the development projects spearheaded by the Directorate of Technical Education (DTE) with the aim of fulfilling its mandate of promoting technical education in the country (Republic of Kenya, 2013). They are meant to ensure that key challenges related to access to quality and relevant technical education are being addressed by developing new institutions in underserved areas and undertaking ICT integration in TIVET to enhance the quality of service delivery and management.

### **STATEMENT OF THE PROBLEM**

The Government of Kenya (GoK) recognizes that its most important resource is its people. It therefore continuously lays emphasis on development of a reliable pool of human capital with the necessary skills and competences to act as the key drivers of the goals of Vision 2030 (Ngure, 2013). One strategy to meet the needs of the labour market was the enactment of the TIVET Act, 2013 to strengthen the relevance and quality of TIVET. This is in line with the Kenya Vision 2030 Second Medium Term Plan (MTP) 2013 to 2017 whose goal is to equip the youth with necessary skills, capital and opportunities to create wealth (GoK, 2013). The implementation of TIVET concept is however affected by the social, economic and political climate current in Kenya (Ngure, 2013). TIVET operates within several Acts of government while the Presidential Circular No. 1/2003 on Organization of the Government places TIVET management under twelve government ministries (GoK, 2003). Despite the importance of TIVET to the country's economy, there's scarcity of comprehensive information on the challenges facing effective promotion of quality, access and relevance of public projects in TIVET institutions. This study sought to fill in the knowledge gap by focusing on the implementation of public projects in TIVET institutions in Nairobi County, Kenya. The study sought to analyze the level of completeness since inception, the challenges faced, possible solutions so as to document the lessons learnt for successful project planning and implementation in the future.

## **GENERAL OBJECTIVE**

To examine the critical performance factors influencing public projects implementation in TIVET institutions in Nairobi County, Kenya.

## **SPECIFIC OBJECTIVES**

1. To investigate whether project planning influences implementation of public projects in TIVET institutions in Nairobi County, Kenya.
2. To examine the influence of project feasibility on implementation of public projects in TIVET institutions in Nairobi County, Kenya.
3. To investigate whether government support has had impact in the implementation of public projects in TIVET institutions in Nairobi County, Kenya.
4. To analyse the influence of project monitoring and control in implementation of public projects in TIVET institutions in Nairobi County, Kenya.

## **THEORETICAL REVIEW**

### **Management by Objective Theory**

The Management by objectives (MBO) theory is based on the thinking that various hierarchies within a project need to be integrated. Drucker (2007), the founder of the theory, argued that all projects exist for a purpose and that to achieve that purpose, top project management team sets goals and objectives that are common to the whole project. MBO thus injects an element of dialogue into the process of passing plans and objectives from one project management level to another.

Management by objectives (MBO) theory details a systematic and organized approach that allows project management to focus on achievable goals and to attain the best possible results using the available resources (Raj, 2012). The theory guides in aligning project goals and subordinate objectives throughout the process of project implementation. The aligning is ideally undertaken during project planning so that the project implementation and management team gets strong input to identify their goals and time lines for completion. MBO also includes ongoing project monitoring and control through tracking and feedback in the project implementation process in order to ensure that the set goals and objectives of the project are all realized within set times using planned resources.

According to (Gotteiner, 2016), the principle behind MBO is to make sure that everybody within the project management and implementation has a clear understanding of the aims, or objectives, of that project, as well as awareness of their own roles and responsibilities in achieving those aims. The complete MBO system is to get project managers and empowered employees acting to implement and achieve their plans, which automatically achieve those of the project. Raj (2012) added that much attention should be paid to the project flow of work, task configurations, and

relationships of project management teams because successful execution is enhanced by good project management techniques, efficient work flows and procedures between functional management groupings, adequate and timely information and feedback, and good leadership.

### **Resource Based Theory**

The theory states that actors lacking essential resources will strive to establish relationships with others to get the resources (Pfeffer & Salancik, 2003). Institutions depend on multidimensional resources like labor, capital, raw materials among others in achieving their objectives especially in cases where they are unable to come out with countervailing initiatives for all these multiple resources. Thus, organizations move through the principle of criticality and principle of scarcity (Pfeffer & Salancik, 2003). According to the theory, organizational survival occurs not only because organizations depends on their environment, but also because the environment is not dependable (Porter, 2008). The environment changes as resources flow and new organizations enter and exit. As the surrounding circumstances change, organizations face the prospect of either not surviving or adapting in response to these environmental challenges. The diversification of an organization's activities does not reduce its dependence on the environment, but merely alters the nature of the interdependence and structures of organizational dependence so that it is more readily managed (Pfeffer & Salancik, 2003).

This theory is important to the study because it can be used to demonstrate the extent to which one organization can go to acquire resources to execute its plans in order to achieve its goals (Jones, 2007). However, the theory assumes that organizations comprise of internal and external coalitions which emerge from social exchanges that are formed to influence and control behavior (Mullins, 2005). The environment is assumed to contain scarce and valued resources essential to organizational survival. As such, the environment poses the problem of organizations facing uncertainty in resource acquisition. Organizations work towards two related objectives. These are: acquiring control over resources that minimize their dependence on other organizations and control over resources that maximize the dependence of other organizations on themselves. Attaining either objective is thought to affect the exchange between organizations, thereby affecting an organization's power.

### **Control Theory**

Control theory uses the notion of modes of control to describe all the efforts put forward in ensuring individuals in a project act in a way that is consistent with project goals and objectives (Kerzner, 2007). According to Tiwana (2009), the concept of control is based on the principle that the controller and the controlee have different interests. It is the controller's mode of control that helps in overcoming the different interests so as to achieve the project goals and objectives. The modes of control may distinguish between formal and informal mechanisms (Tiwana, 2009).

Formal modes of control are defined as behavior control and outcome control (Kerzner, 2007). The former consists of articulated roles and procedures and rewards based upon those rules while the latter refers to the mechanisms for assigning rewards based on articulated goals and outcomes. According to Tiwana (2009), the informal modes of control are carried out by the control modes labeled as clan and self. Clan are the mechanisms of a group sharing common values, beliefs, problems etc. These mechanisms work through activities as hiring & training of staff, socialization etc. The control mode of the self is about individually defined goals and can be carried out through the mechanisms of individual empowerment, self-management and self-set goals.

In the context of public project implementation and management, the project manager and the project teams have different interests (Kerzner, 2007). In order for the project manager to control cost and schedules during the project execution phase, they have to formulate different procedures that ensure that teams are compliant. The control mechanisms and rules must also be aligned with the overall project goals as well as the goals of individual teams (Tonnquist, 2010). Based on this understanding, this research will use control theory to focus on monitoring and control in different phases of project implementation.

## **EMPIRICAL REVIEW**

Past studies on public projects have shown that there are countless challenges that affect their successful implementation including poor project planning, inadequate quality manpower, inadequate finance and poor project monitoring (Chandra, 2010; Oladipo, 2008). This has culminated in projects becoming uneconomical as a result of time and cost over-runs and eventual retarded economic development. On the local front, public projects in TIVET institutions are no exception to these challenges of successful project implementation. This study reviews project implementation challenges categorized under project planning, project feasibility, government support and economic conditions.

### **Project Planning and Project Implementation**

Project planning is the collection of baseline data, needs assessment, developing an action plan, implementation plan and evaluation plan (Kalinova, 2007). The target groups for the project need to be well defined before goals, activities and resources required are formulated. The purpose of project planning is to ensure timely completion of a project including formal closure and transfer of lessons learnt from the project to other projects. Kalinova (2007) further argued that project planning and management of a project, irrespective of its complexity, requires the opinions of a system based on the number of stakeholders involved. According to Anderson (2004), during project planning, sufficient attention must be accorded in the formulation of the project goals and objectives because these are the most vital elements of planning. Even though good project plan does not necessarily result to a good project, any project built on a weak foundation may lead to a good idea resulting into a poor project (Anderson, 2004).

Project planning also involves outlining of the time and cost required by the project. Brown & Hyer (2010) identified estimating project cost as a core part in project planning in addition to identifying the purpose, defining the scope, determining customer requirements, identifying tasks and estimating time. Project planning answers the question: what does the organization hope to accomplish by successfully completing a given project and the expected organizational results (Diallo & Thuillier, 2005). It is important to underscore the critical role that project planning plays in successful project implementation. Khang & Moe (2008) thus contend that project planning requires excellent forward thinking, which includes details of the implementation process, stages and milestones, task timeliness, fallback positions and re-planning. This implies that the initial project planning is not sufficient enough because some projects often take wrong turns and the initial solutions may prove unfounded thereby necessitating re-planning and going back to the drawing board.

The understanding of project planning and management process can be enhanced by applying the project management work book and methodology and project management guide as tools. According to Chanzu & Kaswira (2016), one of the main reasons for the challenges experienced by complex projects is poor articulation of the assumptions during planning stage. Some of the stakeholders may perceive uncertainty about how the change process will progress and therefore pay limited or no attention to the early and midterm changes that occur in the quest for longer term goal. Ondari & Gakera (2013) postulate that, during project planning, clarity of the early steps needs to be undertaken towards the realization of the long-term outcome. The project planning process identifies the necessary and sufficient preconditions required to realize a certain long term outcome. Backward mapping is applied to enable the planners to think from the long-term goals backwards to the intermediate and later early term changes expected to cause the targeted change.

Chanzu & Kaswira (2016) found that regular participation of the community and other stakeholders in project identification, initiation and planning positively influences project successful implementation. They recommended the use of community participatory approach to avoid disparities in the participation of the community during planning and implementation of projects. Limited application of participatory approach may lead to unexpected problems and changes during the latter stages of the project (Nganga, 2011). Alinaitwe (2011) advises therefore that proper project planning is done to eliminate these unexpected project problems during implementation. Mwanzia (2010) postulates that planning facilitates appropriate management of project stakeholders' expectations and concerns because failure to address these may result in countless project failures. Key project stakeholders tend to have the resources and capability to stop projects and their expectations should therefore be properly analyzed during the planning stage. Chandra (2010) cited poor project planning as a major constraint in successful implementation of public projects in India culminating in projects becoming uneconomical as a result of time and cost over-runs. Oladipo (2012) identified poor project

planning as one of the key impediments to successful project implementation in addition to inadequate quality manpower, inadequate finance and poor project monitoring.

### **Project Feasibility**

Project feasibility encompasses three critical success factors (CSF) namely; favourable legal framework; project technical feasibility and stakeholder involvement. Wallenborn (2010) noted that the legal environment within which a TIVET project is being implemented influences the project's success. There's need for clarity, broadness and flexibility in the legal environment. According to Pongsiri (2012), a transparent and sound regulatory framework is necessary in public projects because it provides assurance to the funding bodies. It is critical to attracting major players in mega projects that the government may otherwise not be able to finance. Giuffrida (2007) warns that development partners are always looking for a clear and transparent legal basis because project funding often revolves about the partners knowing their ownership rights and obligations.

Currently, the legal frame work for TVET under the TIVET Bill of 2008 provides for the establishment of a TVET Authority to oversee the TVET systems (GoK 2008). This was intended to strengthen the mechanisms for the implementation of any TVET reforms and enhance the capacity of the sub-sector. However, reports indicate that a sizeable number of private institutions cannot be properly traced in government registration records, implying that they operate illegally (Kingombe, 2008; Ngure, 2013). Such gaps may not allow projects in TIVET to be developed unless a rigorous legal framework is introduced prior to the commencement of the project (AFD, 2015). Weak legal framework may lead to challenges in processes of acquiring the legal TTIs land title deeds as well as preparation and approval of the works designs (Wachira et al., 2009). According to Li et al. (2005), a favourable legal framework is an indication of seriousness and willingness to implement a project as it gives reassurance of long-term and effective support.

The TIVET sector in Africa and Kenya in particular has exhibited different approaches initiated to support the sector. One of them is partnerships through both local and international partnerships all aimed at a vibrant TVET sector (Government of Kenya, 2008). In Kenya, a number of the key stakeholders are involved in TIVET projects (Nyerere, 2009). The Government is involved as a provider of training services through technical institutions, curriculum development, and staff payments among others. Civil societies and Non-Governmental Organizations (NGOs) lobby the government to implement recommendations related to the sector, partake in curriculum development and implement TVET in the informal sector. The business sector (Federation of Kenya Employers, Kenya Private Sector Alliance and the Kenya National Chamber of Commerce) mainly acts as a link between institutions and the industry while the International Labor Organization (ILO) ensures that Kenya conforms with the international labour laws and standards and that it is signatory to international labour protocol and conventions. According to Li et al. (2005) the attitude of all the stakeholders in a project has

an influence on the quality of outputs. The interaction between project participants is a key factor in project management in all the interactive processes namely planning, communication, monitoring and control and project organization in order to facilitate effective coordination throughout the project life. In conclusion, TIVET projects success can be guaranteed if all the key stakeholders and participants work together as a team with predetermined common goals, objectives and defined procedures for collaborative engagement.

### **Government Support and Project Implementation**

All public sector projects are under the ultimate responsibility of the government because of its governance role in project delivery and investment benefit realization (Commonwealth Secretariat 2013). Underlying the core role of governance is a commitment from the national government, its industries and education institutions to take ownership of TIVET. According to Grootings (2007), the success and sustainability of TIVET projects depends on policy development, formulation and implementation based on broad ownership and fit within existing state institutions. In many developing countries, there is a strong reliance on international donor assistance to facilitate education reform. This often results in the transposition of policies and models taken from other contexts with little regard to local conditions and imperatives.

Conclusions based on a UNESCO TVET Survey carried out in 2004 (Kroner, 2006) provide a good summary of the issues relating to the importance of the government on TIVET projects in Sub-Saharan Africa (SSA). First, the involvement of a large number of government ministries, departments and agencies is an indicator of a broad variety of opportunities for vocational learning within a given country. Second, most governments boast already established structures and frameworks for information, communication, collaboration and co-ordination among relevant ministries, departments and agencies. Third, most governments have set national qualifications frameworks to facilitate integration of general education and TVET skills development as a prerequisite for learners to horizontally and vertically move within the education and training system in the course of learning and working (Kroner, 2006).

In Tanzania, education is core to its economic development and the Government of Tanzania (GoT) has given the sector high priority in its development agenda. The government's support is highlighted by funding towards the realization of TVET. Preparation of skilled work force as well as improving the quality of education are some of the main features of the country's educational policy (African Development Fund, 2014). According to Konayuma (2008), the sustainability of TIVET project outcomes has primarily been attributed to the level of ownership by the country. In Tanzania, the state's strong support, sense of ownership and the extensive participation in the development of the project forms a strong foundation for the institutional sustainability of the project.

However, there exists some weaknesses from governments in the implementation of TIVET projects (African Union, 2007). According to (Tikly, 2003), the use of outdated curriculum has

been cited as one of the failures by the government while setting strategies that would link education and training to specific growth paths and prioritizing skills and proficiencies that would lead to a more competitive edge (Tikly, 2003). In Kenya, the duplication of the program and lack of ownership by the line ministries has led to the laxity in curriculum development with Kenya Institute of Curriculum Development (KICD) being unable to regularly update and revise the curriculum due to insufficient funds, poor research and lack of adequately qualified personnel. This is in line with observations that updating and revising of curricula in most African countries often takes place after a major crisis in the labour market or critical problems of graduates' unemployment (Penson & Tomlinson, 2010).

In Kenya, the support from the government has been demonstrated by its investments towards the TIVET sector albeit slow in implementation of related projects (Ngure, 2013). Between 2005 and 2010, the total costs and projections over 5 years (2014 – 2018) for TVET investment programme was estimated to be Kshs. 6.3 billion. Over Ksh3.4 billion having been spent by 2008 on issues of transition from primary, development of skills strategy and enhancement of ICT within the sector among others (Nyerere, 2009). The second level of government support is reflected in the implementation of Vision 2030 Second Medium Term Plan (MTP) 2013 to 2017 whose goal is to equip the youth with necessary skills, capital and opportunities to create wealth (GoK, 2013).

The Kenya government funds training and development through provision of equipment, trainers' salaries, research, monitoring and evaluation in TVET institutions and universities (GoK, 2013). For instance, the cost of training artisans at the youth polytechnics is borne fully by the government. In addition, to encourage women to enroll in the science and engineering courses, the government meets all their training costs. Despite the fact that some of the TIVET programs are highly subsidized, the heads of public institutions have in the past highlighted cases where some students are unable to meet the required payments, leading to drop-outs, or delay in completion of courses (Simiyu, 2009). This impacts on the overall implementation of the TIVET projects.

### **Project Monitoring and Control**

Project monitoring and control ensures that the implementation of project is undertaken in accordance with the terms and conditions (Cherop, 2016). Monitoring and control provides timely reports of all the significant project milestones and also coordinates internal monitoring and evaluation of the supply chain function in respect of the project being undertaken. Meredith and Mantel (2012) cited time (schedule), cost (budget) and scope (performance) as the key project items that need to be monitored and controlled.

Time and cost of public projects are clearly prescribed in the public procurement plan format (Chanzu & Kaswira, 2016). According to section 47 (b) of the public procurement and oversight authority (PPOA) act 2005 and Regulation 31 of the Procurement Regulations (2006), public

project contract variation is effective only if the price variation is based on the prevailing price index obtained from Central Bureau of Statistics or the monthly inflation rate issued by the Central Bank of Kenya. Further, the quantity variation for goods and services must not exceed 10% of the original contract quantity while the quantity variation for works must not exceed 15% of the original contract quantity. The price or quantity variation can only be executed within the period of the project implementation as per the contract.

Project monitoring and control process should be perceived as a closed-loop system with revised plans and schedules following corrective actions. According to Brown & Hyer (2010), the planning-monitoring-controlling cycle is continuously in process until the project implementation is completed. As such, the monitoring and control process should be constructed as an integral part of the organizational structure of the project. Brown & Hyer (2010) highlight the importance of defining the key factors to be monitored and controlled in terms of scope, cost and time and the boundaries within which they should be controlled. They view monitoring as any tracking system from a simple checklist to sophisticated dashboard style approaches, for identifying variances from the original plan (Brown & Hyer, 2010). Chandra (2010) observed that as part of the planning process, a public project team should agree on the appropriate approach for monitoring key performance indicators (KPIs) during the life of the project implementation.

The concept of project control refers to the set of processes, decisions, and actions involved in responding to public project variances. Project control portends a project change management process for deciding when changes are appropriate and when to stay the course. Chandra (2010) identified project characteristics as a key factor that undermines effective project monitoring and control which tends to ultimately impact on the level of project implementation success. Project characteristics encompass the project's size, complex undertakings involving many organizations and people rendering it difficult to keep track of physical performance and expenditure on hundreds or even thousands of activities relating to the project (Chandra, 2010). Project characteristics poses more challenges of coordination and communication difficulties in cases where several organizations and people are involved in the implementation of the same project. Frese (2012) concurs that effective project implementation requires continuous monitoring and measurement of time, milestones, people and equipment schedules. According to Reiss (2012), properly done project monitoring and control will give the first hint that initial planning may not be going according to schedule.

## **RESEARCH METHODOLOGY**

### **Research Design**

A research design refers to the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure (Kothari, 2004). It constitutes the blueprint for collection, measurement and analysis of the

following key questions about the study. In this study, a descriptive research design was used. This method was suitable for this study because it allowed flexible data collection. This design also ensured complete description of the public project implementation situation and provided proper and succinct recommendations to the management of projects in TIVET institutions.

### **Target Population**

Population is the specific group of items that contains the desired information and can answer the research questions (Cooper & Schindler, 2008). The target population in this study consisted of all the public and TVETA accredited institutions in Nairobi County offering at least Diploma courses as at December 2016. There were 18 TVET institutions (Appendix I). This population was appropriate owing to the number of projects in TTIs under TVETA as shown in table 1.

**Table 1: Target Population**

<b>Respondent Category</b>	<b>Number</b>
Principals	18
Heads of Departments and Sections	108
Total	126

### **Sampling and Sample Size**

Sampling is the process of selecting units (people, organizations) from a population of interest so that by studying the sample, one may fairly generalize their results back to the population from which they were chosen (Ngechu, 2010). The aim of the sampling design is to identify the characteristic of the population while saving time, money and giving the researcher accurate solutions and answers to the research questions within a short time period. Sampling technique is the procedure a researcher uses to gather people, places or things to study (Orodho & Kombo, 2002). In this case, it refers to the procedure the researcher will use to select the final sample to study. Using random sampling, the study considered 7 respondents from each of the 18 public and TVETA accredited institutions consisting of the principals, heads of departments and sections. Therefore, the sample size was 126.

### **Data Collection Instruments**

The study relied on primary and secondary data. Primary data was collected using a questionnaire of closed and open-ended questions formulated in line with the objectives of the study. The closed and open-ended questions facilitated the collection of factual information to aid in analyzing the data. The questions were also based on a 5-point Likert scale. The researcher delivered the questionnaires to the respondents then collected them later. This ensured the capturing of all the issues required and also ensured high response rates. Secondary data was obtained from both internal and external documentation through review of the public project in

TTIs, policy and/strategy documentations as well as from various published sources, the internet and websites of relevant organizations and institutions.

### **Data Analysis and Presentation**

Data analysis involves examination of the information (data) that has been collected in a survey or experiment and making deductions and inferences (Kombo & Tromp, 2006). Before analysis, data must be cleaned, edited, coded and categorized so that accurate deductions and inferences can be made in order to answer the research questions (Sekaran, 2006). The completed questionnaires were checked and edited for completeness and consistency before processing the responses. The data was then appropriately coded and categorized in groups that related to the variables being interrogated. Content analysis was used to analyze qualitative data which involved making inferences from the empirical studies and determining whether these studies are consistent or divergent. On the other hand, Statistical Package for Social Sciences (SPSS V.21) was used to enter quantitative data while analysis was done using descriptive statistics to generate frequencies and percentages. Data was presented in form of frequency tables, percentages, mean scores and standard deviation for easier interpretation and deduction. The relationship between the independent and dependent variables was modelled using the following linear regression model:

$$Y = 3.374 + 0.089X_1 + 0.023X_2 + 0.330X_3 + 0.167X_4$$

Where: Y is the successful project implementation and  $\beta_0$  is constant,  $X_1$  is project planning,  $X_2$  is project feasibility,  $X_3$  is government support,  $X_4$  is monitoring and control and  $\varepsilon$  is the error term.

## **RESEARCH RESULTS**

### **Project Planning**

The study found that to a great extent, the application of Logical Framework tool in project planning and assessment of the expected output affect the implementation of public project in TIVET institutions. These results are consistent with those of Tonnquist (2010) and Zwikael and Saleh (2006) who established that project planning and scheduling of the project's tasks informs the financial planning. Project planning should therefore focus more on the role level rather than the activity level.

Further findings showed that projections of completion can be a challenge to project implementation to a great extent particularly when the range of input in the project plans e.g. material, labour are put into consideration. This is consistent with the findings of Chandra (2010) who cited poor project planning as a major constraint in successful implementation of public projects which may culminate in projects becoming uneconomical. In addition, evaluation of time schedule of project outcomes and range of activities in the project plan can, to a great

extent, be a challenge to public project implementation in TIVET institutions. Oladipo (2012) also cited poor project planning as one of the key impediments to successful project implementation.

### **Project Feasibility**

Study findings showed that favourable legal framework affects implementation of public projects to a very great extent which is consistent with Wallenborn's conclusion that the legal environment within which a project is being implemented influences the project's success and therefore, there is need for clarity, broadness and flexibility in the legal environment (Wallenborn, 2010). The findings are also in line with Pongsiri (2012); that a transparent and sound regulatory framework is necessary in public projects because it provides assurance to the funding bodies. It is critical to attracting major players in mega projects that the government may otherwise not be able to finance.

Project technical feasibility; appropriate risk allocation and sharing; support and responsibility of public and private sectors; strong private consortium and stakeholder support were also found to affect implementation of public projects to great extent. Li et al. (2005) also established the same results whereby the attitude of all the stakeholders in a project has an influence on the quality of outputs. They recommended that attention be given to the interaction between project participants because it is a key factor in project management in all the interactive processes like planning, communication, monitoring and control and project organization. These facilitate effective coordination and implementation throughout the project life. In conclusion, TIVET projects success can be guaranteed if all the key stakeholders and participants work together as a team with predetermined common goals, objectives and defined procedures for collaborative engagement.

### **Government Support**

Regarding government support, the findings showed that, to a very great extent, government guarantee influences public projects implementation in TIVET institutions. Government goodwill; policy development; structures and frameworks for information, communication, collaboration and co-ordination were found to affect public project implementation to a great extent. On the other hand, the sense of project ownership by the government was found to affect implementation to a moderate extent. Similar results were obtained by Grootings (2007); that the success and sustainability of TIVET projects depends on policy development, formulation and implementation based on broad ownership and fit within existing government institutions. The support as defined by the involvement of a large number of government ministries, departments and agencies is an indicator for a broad variety of opportunities for vocational learning within a given country. In addition, governments boast already established structures and frameworks for information, communication, collaboration and co-ordination among relevant ministries,

departments and agencies which enhance the implementation of projects in TIVET institutions (Kroner, 2006).

### **Project Monitoring and Control**

Monitoring aspects of the project in terms of cost of project activities; the quality of project output and the scope of projects implementation were found to affect public project implementation to a great extent. According to Cherop (2016), project monitoring and control ensures that the implementation of project is undertaken in accordance with the terms and conditions. The process provides timely reports of all the significant project milestones and also coordinates internal monitoring and evaluation of the supply chain function in respect of the project being undertaken.

### **CORRELATION ANALYSIS**

A correlation is a number between -1 and +1 that measures the degree of association between two variables. A positive value for the correlation implies a positive or direct relationship. A negative value for the correlation implies a negative or inverse association (Zikmund, 2011). Table 2 shows a summary of the correlation coefficient results.

**Table 2: Correlation Coefficients**

		<b>Public Project Implementation in TIVET Institutions</b>	<b>Project Planning</b>	<b>Project Feasibility</b>	<b>Government Support</b>	<b>Monitoring and Control</b>
Public Project Implementati on in TIVET Institutions	Pearson Correlation Sig. (2-tailed)	1				
Project Planning	Pearson Correlation Sig. (2-tailed)	0.471	1			
Project Feasibility	Pearson Correlation Sig. (2-tailed)	0.309	0.038	1		
Government Support	Pearson Correlation Sig. (2-tailed)	0.248	0.120	0.364	1	
Monitoring and Control	Pearson Correlation Sig. (2-tailed)	0.442	0.223	0.254	0.633	1
		0.032	0.052	0.083	0.579	

The correlation analysis depicts a positive relationship between the project planning and project implementation, where the correlation coefficients was 0.471 and a p-value of 0.000. The study also found that project feasibility correlate positively with correlation coefficients of 0.309 and p-value of 0.002. The study further established that there is a positive relationship between government support and public project implementation in TIVET institutions with a correlation coefficient of 0.248 and p-value of 0.031. Additionally, the study found that there is a positive relationship between project monitoring and control and public project implementation with a correlation coefficient of 0.442 and a p-value of 0.032.

## **REGRESSION ANALYSIS**

Regression analysis was conducted to establish the relationship between project planning, project feasibility, government support and project monitoring and control and successful implementation of public projects. The main purpose of regressions is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable. Regression tests were done which included Model goodness of fit. The coefficient of determination is a measure of how well a statistical model is likely to predict future outcomes (Table 3). The coefficient of determination, R<sup>2</sup> explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (measuring firm performance) that is explained by all the independent variables (project planning, project feasibility, government support and project monitoring and control).

**Table 3: Coefficient of Determination**

<b>Model</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>Std. Error of the</b>
Project Planning	0.097	0.009	0.003	0.718
Project Feasibility	0.257	0.066	0.060	0.697
Government Support	0.365	0.085	0.076	0.564
Project Monitoring and Contro	0.275	0.076	0.194	0.820

A multiple regression analysis was conducted to establish the relationship between various dimensions of strategic change and firm performance and the four independent variables. Table 4 shows a summary of the multiple regression analysis. From the regression model, for every added unit in project planning, project feasibility, government support and project monitoring and control, there will be an increase in successful public project implementation by 0.089, 0.023, 0.330 and 0.167 respectively. These further results infer that all the explanatory variables of the study are statistically significant (P = 0.0067, P = 0.046, P = 0.0015, P = 0.0041). In statistics, a significant level of p < 0.05 is significant. This means that the four predictor variables are useful for predicting the successful implementation of public projects in TIVET institutions.

**Table 4: Multiple Regression Analysis**

	Unstandardized Coefficients		Standardized Coefficients Beta	t	Sig.
	B	Std. Error			
(Constant)	3.374	0.842		4.009	0.0000
Project Planning	0.205	0.105	0.089	0.849	0.0067
Project Feasibility	0.118	0.084	0.023	0.954	0.0046
Government Support	0.853	0.146	0.330	2.276	0.0015
Project Monitoring and Control	0.753	0.088	0.167	1.379	0.0041

Table 5 presents the regression model goodness of fit statistics to determine whether successful public project implementation has a linear dependence on project planning, project feasibility, government support and project monitoring and control. The study established a correlation value of 0.981. This depicts a very good linear dependence between successful public project implementation and the four predictor variables. An R2 value of 0.863 was established in the model and adjusted to 0.691. The coefficient of determination depicts that the four independent variables contribute about 86.3% to the variation in performance while other factors not included in the study contribute 13.7% of the performance. Therefore, further research should be conducted to investigate the other factors (13.7%) that affect public project implementation.

**Table 5: Regression Model Goodness of Fit**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate
1	0.981(a)	0.863	0.691	0.752

Further, Table 5 shows the ANOVA findings as explained by the P-value of 0.000 which is less than 0.05 (significance level of 5%) confirming the existence of correlation between the independent and dependent variables. The model shows the model fitness i.e. how well the variables fit the regression model. The sum of squares gives the model fit and hence the variables fit the regression model. From the results, the F ratio of 0.587 and the significance of 0.000 shows that there was no much difference in the means. Since F calculated is greater than the F critical (value = 2.371), this shows that the overall model was significant.

**Table 6: ANOVA**

	Sum of squares	Df	Mean Square	F	Sig or P-value
Regression	6.797	2	3.399	0.587	000 <sup>a</sup>
Residual	11.582	2	5.791		
Total	18.379	4			

Predictors: (Constant), project planning, project feasibility, government support and project monitoring and control.

## **CONCLUSIONS**

### **Project Planning**

The study concluded that there is a positive relationship between project planning and successful public project implementation. Thus, every improvement in planning and scheduling of project tasks and project financing will result into an increase in successful public project implementation. Therefore, project planning is useful for predicting the successful implementation of public projects in TIVET institutions.

### **Project Feasibility**

The study concluded that there is a positive and significant relationship between project feasibility and successful public project implementation. Enhanced project designing coupled with clear, broad, flexible and favourable legal framework and environment will increase the rate of successful public project implementation. Project feasibility provides assurance to the project financiers and it's therefore, as a predictor variables, very useful for predicting the successful implementation of public projects in TIVET institutions.

### **Government Support**

In conclusion, a significantly positive relationship between government support and successful public project implementation was established. Thus, every added unit in government support in terms of government guarantee, favourable policies and political goodwill is likely to will result into an increase in successful public project implementation. As a predictor variable, the study concluded that government is very important for the successful implementation of public projects in TIVET institutions.

### **Project Monitoring and Control**

The study concluded that a positive and significant relationship exists between project monitoring and successful public project implementation. An improvement in accuracy and timely availability of reports of all the significant project milestones will result into an increase in successful public project implementation. This means that the monitoring and evaluation of the supply chain function in respect of the project being undertaken is useful for predicting the successful implementation of public projects in TIVET institutions.

## **RECOMMENDATIONS**

### **Project Planning**

TIVET institutions should ensure that all tasks relating to public projects are properly planned and scheduled to appropriately inform the project financing. This is because poor project

planning can culminate in projects becoming uneconomical. Poor project planning is one of the key impediments to successful public project implementation.

### **Project Feasibility**

The administration of TIVET institutions should ensure that all public projects in their institutions are designed along clear, broad, flexible and favourable legal framework and environment for success. This provides assurance to the project financiers particularly for mega projects that the government may otherwise not be able to finance.

### **Government Support**

Regarding government support, the study recommends adoption of initiatives that can enhance the sense of projects ownership by the government because it may adversely affect their implementation. This can be done through the involvement of a large number of government ministries, departments and agencies is an indicator for a broad variety of opportunities for vocational learning within the country.

### **Project Monitoring and Control**

Project monitoring and control should be periodic. This will ensure timely availability of reports of all the significant project milestones and also coordinates internal monitoring and evaluation of the supply chain function in respect of the project being undertaken.

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