

**PERCEPTION OF MATHEMATICS AND SCIENCE TEACHERS IN  
PUBLIC SECONDARY SCHOOL OF THE EFFECTIVENESS OF THE  
TRAINING PROGRAM ON STRENGTHENING MATHEMATICS AND  
SCIENCE EDUCATION (SMASE) IN KIAMBU COUNTY**


**PERIS WANJIRU GACHU**

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## DECLARATION

This research project is my original work and has not been presented for the award of degree in any other university.

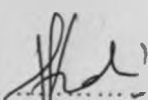
Signature.....

Date 18/11/2013

**GACHU PERIS WANJIRU**

**REG. NO. D61/61512/2010**

This project has been submitted for examination with my approval as a university supervisor.

Signature.....

Date 18/4/2013

**FLORENCE MUINDI**

**LECTURER**

**DEPARTMENT OF BUSINESS ADMINISTRATION**

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I thank the almighty God for good health, strength, resilience and grace to go through this program. It is by his grace that I have come this far.

Worthy of my special mention is my husband and son who has been my pillar of strength and encouragement especially when the going was tough. Also my parents and siblings have been of great support throughout the program. I love you all.

I also appreciate my supervisor Florence Muindi and moderator Prof. K'obonyo who patiently and competently guided me through this project, thank you for all your assistance.

## **DEDICATION**

I dedicate this project to my husband Samwel Kamunge and my son Alvin Kamunge for walking with me throughout this program. Thank you for your prayers, encouragement and support. You have been an invaluable source of strength and I thank God so much for you.

## ABSTRACT

The objective of this study was to perception of mathematics and science public secondary school teachers on the effectiveness of the strengthening mathematics and science education (SMASE) training program in Kiambu County. The study used the descriptive survey research design. The sample size of the study was 176 respondents. Primary data was collected by use of questionnaires consisting of both open-ended and closed-ended questions. The findings revealed that there is a positive relationship on the perception of respondents on their reaction towards SMASE training program, they agreed that learning took place after the training, that there was a change in their behavior after the training and also agreed that there were good results after the training. This study recommends that the SMASE program managers seek new strategies on how they can include smaller programs for science and mathematics students from the various schools. Teachers accept that the SMASE training program is effective and there is a need to change the attitude and behavior towards the same. The study also recommends that proper measures of performance be put in place and that the right strategies be used to ensure their implementation. Proper evaluation measures of performance or results obtained from the science and mathematics subjects need to be used for this will help establish whether concepts learnt in the SMASE training program have been applied or not.

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## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

Training enables to people acquire skills and they not only make themselves more productive, able to produce more and for a given period of time and effort but also make themselves more productive since most work is done in teams. Therefore ones productivity generally depends on others productivity, thus the more the training one has, the more others can learn from him about performing certain task and the more the two can interact in production (Booth & Shower 1996). Training is a process that tries to improve skills or add to the existing level of knowledge so that the employee is better equipped to do his present job, or to mould him to be fit for a higher job involving higher responsibilities. That is, training is a learning experience which seeks a relatively permanent change in an individual that will improve his ability to perform his job, (Khanka, 2011).

According to Beardwell and Holden (1997) recognition of the importance of training in recent years has been heavily influenced by the intensification of overseas competition and the relative success of economies such as Japan, Germany and Sweden where investment in employee development is considerably emphasized. Technological developments and organizational change have gradually led some employers to realization that success relies on the skills and abilities of their employees, and this means considerable and continuous investment in training and development. Betts (2000) agrees that any country with a highly trained workforce has a distinct advantage over those which have neglected this vital factor. Some of the importance of training is that it leads

to improvement of job performance and also improved quality and quantity of products and services. Also training helps to reduce learning time required to help employees reach acceptable standards of performance. Training ensures the creation of more favorable attitudes towards work and the organization. Also it helps employees in their personal development and career advancement and minimizes supervision time (Nzuve, 2010). Graham & Bennet (1998) agrees that under favorable circumstances, training has an important function of motivation and by improving employee ability to perform the tasks required by the company, training allows better use to be made of human resources, by giving employees a feeling of mastery over their work and of recognition by management their job satisfaction is increased.

### **1.1.1 Concept of Perception**

Perception is the process people use to make sense out of their environment by selecting, organizing and interpreting information from the environment, (Daft 2000). Investment in training and development programs is very important and so is employees' perception of the effectiveness of the training and development programs since perception influences behavior. The reason perception affects the organization's process is because if employees cant perceive the goal or aim of the organization properly, then they might not be working towards it either and if they are not working towards it , then the organization faces a gap between what is required of the people and what is actually being done. Perception is largely selective. Selectivity of perception acts as a filter through which potentially important or favorable experiences will be allowed to flow, while potentially unimportant or unfavorable experiences are locked out. Extensions of this are selective exposure and selective retention (Kibera & Waruinge, 1998).

People emerge with different perceptions of the same stimulus object because of 3 perceptual processes; selective attention, selective distortion and selective retention. Selective attention occurs when people exposed to tremendous amount of stimuli and they choose to have a heightened awareness of stimuli that meet their needs and minimal awareness of stimuli irrelevant to their needs. Selective distortion describes the tendency of people to twist information to personal meaning. Selective retention asserts that people will forget much of what they learn and tend only to retain information that supports the beliefs and attitudes for chosen alternatives (Kotler, 1998).

Cole (2002) defines perception as the process of organizing, interpreting and integrating external stimuli received through the senses; the mental process involved in identifying and subjectively interpreting objects, concepts and behavior; the attainment of awareness, insight and understanding. Employee perception is a factor that can make a huge difference in the quality of the workplace. When employees view the employer, their work, and their relationships within that workplace as being positive, there is a good chance the employee will be productive and remain with the employer for a long time. Negative perceptions of the company and the working environment can cause qualified employees to seek opportunities elsewhere. Some of the factors that can impact employee perception include how well the employer communicates with employees, the nature of the working conditions, the policies and procedures of the business in general, and how much trust and respect is present between managers, employees, and coworkers. In addition, the benefits paid and how they relate to the work assigned can also have a huge impact on the perception of an employee. McShane & Glinow (2008) defines perception as the process of receiving information about and making sense of the world around us. It

entails deciding which information to notice, how to categorize this information, and how to interpret it within the framework of our existing knowledge. Donnelly et al 1992 agrees that selective perception occurs when people block out new information, especially when it conflicts with what they believe. Thus when people receive information, they apt to hear only those parts that conform to or reaffirm their beliefs. Information that conflicts with preconceived notions either is not processed or is distorted to confirm our preconceptions.

### **1.1.2 Concept of Training**

Training is the act of improving one's knowledge and skills to improve his/her job performance. Training is job oriented. It bridges the gap between what the employee has and what the job demands. For that matter, imparting training to employees working in all organized sectors of human activity is no longer a matter of debate. As a matter of fact, of late, the need for training has been recognized as an essential activity not only in the business organizations, but also in academic institutions, professional bodies and the government departments (Khanka, 2011). Training according to Cole (1997) is any learning activity which is directed towards acquisition of specific knowledge and skills for the purposes of an on occupation or task. It is about acquisition of skills to increase the performance of employees. Training of employees enhances their ability to give better and quality services. This can be noted through their response to customer demand, their speed of service delivery and improved public relation skills. Training is specific to the needs of an organization. It helps people to perform better in a job either through improving their fit with job requirements or through creating a better fit with overall

strategies, philosophies, and culture of the organization as whole (John and Donald, 1995).

Nzuve (2010) argues that training includes all the processes whereby employees are shown and taught the necessary skill for performing a particular job. Consequently, any education which is technical in nature should be regarded as training. Training should be comprehensive in enough to allow an employee to understand the nature of work to be performed. Therefore, the training given should be appropriate to the type of work to be performed. After new employees are hired by a company, they often go through a training period, prior to being assigned major job duties. This training is usually intended to orient them to the positions and to give them the information they need to carry out their daily responsibilities, (www.employee training).

### **1.1.3 Effectiveness of Training**

For training to be effective, its purpose should be clearly defined in terms of 'criterion behavior' required as a result of training and the term 'terminal behavior' expected. Also the content of the training should be related to the work contexts of the participants. Ideally, their work should be made a central feature of the subject matter. Every opportunity should be taken to embed learning at work. The training techniques used should be appropriate to the purpose of the course and to the characteristics of participants- their jobs, learning needs, previous experiences, level of knowledge and skills, and how receptive they will be to being taught. A blend of different techniques should be used where appropriate (Armstrong, 2007). DeCenzo (2010) agrees that management should explicitly state the desired results of training for each employee. It is

not adequate to say we want change in employee knowledge, skills, attitudes, or behavior; we must clarify what is to change and by how much. These goals should be tangible, verifiable, timely, and measurable. They should be clear to both the supervisor and the employee.

Assessing how far the investment in training has been worthwhile is the 'bottom line' of the systems approach to training. The main question is: has training had the effects on individual and corporate performance that it was intended to have? (Tyson & York, 1996). In the evaluation phase of the training process, the effectiveness of the training programme is assessed. Companies can measure effectiveness in monetary or nonmonetary terms. Whatever the terms, the training should be judged on how well it addressed the needs it was designed to meet. A very least companies should estimate the cost and benefits of a training programme, even if these cannot be directly measured. Without such information, training's financial value cannot be demonstrated, and upper management may feel there is no compelling reason to continue the training effort, (Gomez-Mejia et al, 2010). Khanka (2011) adds that the following steps are important in developing training programmes; identification of training needs, setting training objectives, designing training methods, administration of training programmes, and evaluation of training.

#### **1.1.4 Strengthening Mathematics and Science Education Training Programme (SMASE)**

Strengthening mathematics and science education (SMASE) program at secondary school level was declared in the Seventh National Development Plan of Kenya to establish

industrialization and its sustainability. On the other hand, Japan declared “the educational cooperation to African countries” at the general meeting of UNCTAD (United Nations Conference on Trade and Development) in April 1996. The declarations of both countries realized the fruition of SMASE (1) project from July 1998. In line with Kenyan government policy, the SMASE project was launched to enhance mathematics and science education by in-servicing secondary school teachers in the country with assistance of Japan International Cooperation Agency (JICA). The project was launched in the then Kiambu district in the year 2001, ([www.SMASE.com](http://www.SMASE.com)).

The project, therefore, conducted intensive baseline study in the very first year of operation (1999) in order to grasp the situation of mathematics and science education for its preparation. This was carried out in the then Kisii, Gucha, Butere-Mumias, Kakamega, Maragua, Muranga and Kajiado District. Among this study, the views on educational objectives and on teaching approaches were asked both to students and to teachers by means of multiple-choice questionnaires. The initiative was in response to the continuous poor performance in mathematics and science despite effort of employing qualified teachers, increasing salaries, providing equipments and constructing laboratories and mathematics classrooms. SMASE in-service program was made available and compulsory to all mathematics and science teachers in the country in 2004 at the district level. The Activity, Student, Experiment and Improvisation (ASEI) through Planning, Doing while Seeing then Improving (PDSI) approach introduced through the SMASE project is an attempt to improve performance, (Maina, 2009).

SMASE training program was started with the aim of upgrading performance in mathematics, chemistry, biology and physics. The teachers are trained during either in April or August holidays for one week whereby the teachers must attend and those who are not able to, must formally write to the Teachers Service Commission (TSC) explaining why they were not able to attend. This program is important since it aims at equipping teachers with skills about proper classroom control. Also the teachers are trained on how to present subject concepts in a way that is simple and clear to the learners. The main objectives of the programme was; to enhance and upgrade capability of Mathematics and Science teachers in terms of teaching methods, knowledge and management of experimental equipment in Mathematics and Science, to enhance frequent and regular interactions among Mathematics and Science teachers, and to establish and institutionalize In service trainings in all districts of the country (Maina, 2009).

### **1.1.5 Public Secondary Schools in Kiambu County**

Education in Kenya was introduced by the missionaries in the early days. The missionaries interacted with locals in the coastal town of Mombasa and set up one of the earliest mission schools in the country at Rabai in 1846. Before independence elementary education was based on the colonial system of education. In 1967 Kenya together with Uganda and Tanzania adopted 7-4-2-3 system of education. Later in 1984, 8-4-4 system of education was introduced in Kenya which adopted 8 years of primary education, 4 years of secondary education and 4 years of university education. The objectives of secondary education was that it should provide the learner with opportunities to: acquire necessary knowledge, skills and attitudes for the development of the self and the nation;



promote love for and loyalty to the nation; promote harmonious co-existence among the peoples of Kenya; develop mentally, socially, morally, physically and spiritually; enhance understanding and respect for own and other people's cultures and their place in contemporary society; enhance understanding and appreciation of inter-relationships among nations; promote positive environmental and health practices; build a firm foundation for further education and training; develop ability for enquiry, critical thinking and rational judgment; develop into a responsible and socially well adjusted person; promote acceptance of and respect for all persons; enhance enjoyment in learning; identify individual talents and develop them; build a foundation for technological and industrial development; and develop into a self individual who appreciates work and manages time properly ([www.education in kenya.com](http://www.educationinkenya.com)).

Kiambu County has 218 secondary schools. 5 are National schools while 213 are County schools which are either day schools, boarding schools or boarding and day schools. All the subjects in secondary schools are grouped into 4 departments i.e. languages, science, humanities and applied science departments. It is in science department that we have mathematics, physics, chemistry and biology and therefore SMASE training program trains teachers in this department. The county has approximately 10 SMASE training stations. In each station there are 12 trainers i.e. 3 for mathematics, 3 for biology, 3 for chemistry and 3 for physics. The training runs for one week during April or August holiday where by all the subject teachers should attend, (SMASE training programme - 2011).

## **1.2 Research Problem**

Many organizations invest a lot in the training of its employees while anticipating to get positive results. In some cases these results may not be obtained, for instance, when the trainees see no purpose in the training, when it is regarded as punishment or a sign of displeasure or when the training seems irrelevant to the training needs. Another challenge is that training is expensive, often trainees are not producing while they are being trained and they might leave the company as soon as their training ends, and individual firms can sometime recruit competent employees at low cost from outside. Also workers' job expectations typically increase in consequence of training, so that if trained employees are not immediately put on to work that requires them to exercise their recently acquired competencies they might become disaffected and look for other jobs where they can use their new skills, (Graham & Bennet, 1998). Just as equally important as investment in training programmes is employees' perception of the effectiveness of the training programmes since perception influences behavior. Paauwe and Richard (1997) concluded that positive perception of employees with respect to employee selection, training, personnel planning and reward has an effect on human resources management results like satisfaction, motivation, retention, trust and involvement.

SMASE training program is facing a number of challenges. First, the teachers were not involved in its establishment and they therefore do not own it and many only attend because they must. Also, the teachers are not given an opportunity to express what they need to be trained on and what is relevant in the teaching process. In this case, according to the teachers they are trained on issues that are not essential. This leads to frustration since the teachers feel that they are not fully involved. This also leads to lack of

implementation of what is learned by the teachers when teaching. The main objective of the program is to help in improving the performance of the mentioned subjects. This improvement has been minimal and even sometimes a negative deviation in some subjects. For instance, the following is K.C.S.E performance in Rev. Musa Gitau Secondary School in Kikuyu from 2008 to 2012. Arranged from 2008-2012; Mathematics 1.89, 3.00, 2.30, 2.89, 3.22, Chemistry 2.69, 2.90, 2.28, 2.89, 3.40, Biology 3.45, 3.35, 3.11, 3.53, 3.71, Physics 2.02, 3.00, 3.05, 3.10, 6.33. From this data above, the deviations have been minimal and in some instances a negative deviation occurred. For instance, there was negative deviation in 2010 except in physics. Since all the teachers in the school attend the training, the performance is expected to be better than this.

Previous studies have been done on various aspects of training and development. Some of the studies include; Odhiambo (2011) focused on the perception of the employees of Kenya Power and lighting Company Limited on the effectiveness of training and development programs. The findings was that the perception of employees on the effectiveness of the training and development function is of strategic importance as employees are the driving force behind any successful productivity. If staff perception of what is expected of them is consistent with the actual expectations of the organization, then the result is effective performance. Gakuru (2006) studied the relationship between training practices and performance in companies listed in the Nairobi Stock Exchange and found that companies practicing systematic training recorded higher profits than companies practicing non-systematic training. Also the effectiveness of the training method was the greatest determinant of training in companies practicing systematic training while companies practicing non-systematic training considered cost first before

choosing a training method. Nguku (2006) in his survey of staff training and development practices in the state corporations in Kenya found that increase productivity instructions can help employees increase their level of performance on their present assignments which leads to increased specialization, productivity and increased organization's products. This was the major reason as to why their organizations conduct training and development to employees. Research has not been done in the context of secondary school mathematics and science teachers and therefore the purpose of this study is to evaluate the perception of teachers towards the effectiveness of SMASE training program in Kiambu County. This statement leads us to the question: what is the perception of science and mathematics teachers on the effectiveness of SMASE training program in Kiambu County?

### **1.3 Research Objective**

To establish the perception of Mathematics and Science public secondary school teachers on the effectiveness of the Strengthening Mathematics and Science Education (SMASE) training program in Kiambu County.

### **1.4 Value of the Study**

The findings will enable the school heads to come up with a follow up program for the teachers who attend the program so as to ensure that they are able to implement what they are trained during teaching process. The findings will also enable the policy makers on the program to re-evaluate the program so as to see if the program is meeting its objectives. Also, they will be able to identify the areas in which the teachers are dissatisfied so as to improve on those areas and thus make the program more effective.

The study will help the human resource development department at the Ministry of Education to diagnose the present perception of teachers with respect to the effectiveness of the training and development programs hence they will be able to initiate any change if necessary. Also the human resource development head of department will use the findings to formulate relevant policies on training and development investment.

Students and future scholars will use the research findings as a source of knowledge and for reference for carrying out research in similar or related topics. This is from the suggested areas that need further research.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presented the literature reviewed with regard to training programs. The chapter hence provided detailed information on training and development, training and development programmes and the measures of the effectiveness of training and development programmes.

### **2.2 Employee Training**

Training is a planned process to modify attitude, knowledge or skills behavior through learning experience to achieve effective performance in an activity or range of activities. Its purpose, in the work situation, is to develop the abilities of the individual and to satisfy the current and future needs of the organization (Beardwell & Holden, 1997). According to Betts (2000), training provides a source for the individual to achieve competence in technical and technological aspect, in performing tasks, and in improving skills. To be effective, these learning activities must be integrated and applied at all organizational levels in a continuous development program. Armstrong (2006) argues that training is the use of systematic and planned instructions activities to promote learning. It involves the use of formal processes to impart knowledge and help people to acquire the skills necessary for them to perform their jobs satisfactorily.

Training represent the short-term acquisition of knowledge, skills and attitudes which individuals need to learn in order to be able to effectively undertake their job role (Walton, 1999). According to David et al (1999), training typically focuses on providing employees with specific skills or helping them correct deficiencies in their performance.

Its scope is on individual employees and focuses on immediate organizational needs. Its goal is on fairly quick improvement in workers' performance. Training strongly influences present performance levels. Nzuve (2010) agrees that training is the imparting of proficiencies and knowledge that are specifically related to relatively narrow areas of employment. Training enables people to acquire new knowledge, learn new skills and perform tasks differently (better) than before. It attempts to teach a person how to perform particular activities or a specific job.

Okumbe (2001) defines training as the process of providing teachers and other employees with specific knowledge and skills in order to enable them to perform specific teaching tasks. It is a short term educational process which utilizes systematic and organized procedures by which non-managerial personnel learn technical knowledge and skills for a definite purpose. Armstrong (2006) adds that training is the planned and systematic modification of behavior through learning events, programmes and instruction, which enable individuals to achieve the levels of knowledge, skills and competence needed to carry out their work effectively. Every organization needs well-adjusted, trained, and experienced people to perform its activities. As jobs in today's dynamic organizations become more complex, the importance of employee education has increased. Employee training is a learning experience: it seeks a relatively permanent change in employees that improves job performance. Thus, training involves changing skills, knowledge, attitudes, or behavior. This may mean changing what employees know, how they work, or their attitudes towards their jobs, co-workers, managers, and the organization (DeCenzo, 2010).

## 2.3 Training Programs

Training consists of programmes which are deliberately planned to improve performance at the individual, group and organizational levels. When there is a remarkable improvement in performance it shows that there has been gainful acquisition of knowledge, skills and attitudes. For a training programme to be useful in an organization, specific training objectives must be stipulated and the training is thus designed to meet specific job behaviors which are desired by the organization. A well designed programme enhances employees' abilities to learn new work methods and also helps them to adjust to changes in both the content and context of teaching or any assigned job. The training program must be evaluated constantly in a well planned manner. (Okumbe 2001).

Beardwell & Holden (1997) states that a careful use of training methods can be a very cost-effective investment in the sense of using the appropriate method for the needs of a person or a group. However, it have been frequently mentioned that organizations often use inappropriate methods which can be both costly and time wasting and bring very little improvement in the performance of the employee. Training is an expensive undertaking and should not be undertaken for the sake of it. It should be planned for just like any other management of human resource function. When properly done, it can benefit both the organization and the employee(s). Training activities will need to be designed and evaluated according to the demand of the organization (Nzuve 2010).

While many organizations carry out excellent training programs, the final and perhaps most vital stage is often ignored. As Easterby-Smith and Mackness (1992) wryly state, training evaluation is commonly seen as a feedback loop, starting with course objectives



and ending by collecting end-of-course reactions which are then generally filed away and not acted upon. At the end of a training phase it is essential to see whether training has effectively met the business objective. Beardwell and Holden (1997) agrees that evaluation of training programs is one of the most important but often the most neglected or at least adequately carried out parts of the training process. Nzuve (2010) defines evaluation of training as the systematic collection of descriptive and judgmental information necessary to make effective training decision in relation to the selection, adoption and modification of various instructional activities. The criteria for evaluating training programs are determined by the training objectives. Many training programs try to accomplish several objectives such as behavior change and provision of new information.

Training evaluation checks whether training has had the desired effect. Training evaluation ensures whether candidates are able to implement their learning in their respective workplaces, or to the regular work routines. It is the phase when learner's skills and knowledge are assessed again to measure the effectiveness of the training. This phase is designed to determine whether training has had the desired effect at individual, department and organizational levels. Evaluation can be done through various techniques like Observation, Questionnaire, Interview, Self diaries and Self recording of specific incidents (Nzuve 2010).

## **2.4 Measures of Effectiveness of Training**

Cascio (2000) Dowling and Welch (2005) all agree that as a result of the financial investments organizations make in training, it is important for them to provide evidence that training efforts are fruitful. Organizations must ensure that training leads to desired

work outcomes. Pettinger (2002) asserts that for training to be effective, all training programmes require specific, precise and clear objectives. Training like any other Human Resource Management function, can be very wasteful if not carefully planned, implemented and supervised. Okumbe (2001) agrees that for a training programme to be useful in an organization, specific training objectives must be stipulated and the training is thus designed to meet specific job behaviors which are desired by the organization.

Training must be strategic. Effective training initiatives will be specific to the firm. For the course to work, the tailored course needs to absorb the spirit of the organization, its problems, and issues it faces. Training can only be strategic if it is incorporated into the overall corporate business strategy. It is in this way that the Human Resource development function attains the status it need to survive and to have a long term impact on overall business performance and respond to significant competitive and technological pressures. Dessler (2008) notes that not all employees see the need for, or the value of, development and the means that reward system need to be supportive of the development strategy. If we want employees to learn new skills and become multi-skilled, it is skills development we need to reward rather than the job that is currently done. Harrison (1993) found that these links are not very strong in most organizations.

Training needs to be continuous because of the constantly changing business environment. Changing technology and patterns of work means that training must be a continuous process throughout a working life if it is to be successful. Hacket (1996) agrees that skills acquired for one job may be transformed, modified and supplemented for other jobs. Okumbe (2001) adds that training should be seen as a “womb to tomb” management activity. According to Nair and Rao (2000), most Japanese organizations are

committed to continuous development of their human resource. Large companies in Japan follow a philosophy of lifetime education. Cole (1997) argues that training job is never finished so long as the organization remains in business. He asserts that training is not a "one stop process."

To ensure effectiveness, the training programme must be evaluated constantly in a well-planned manner. Such evaluation should include: the extent to which training objective are being met, the extent to which training has brought about behavior change in the participant, the extent to which training programme has brought about the attainment of organizational goals and the extent to which the training programmes were varied and reliable (Okumbe, 2001). Cole (1997) states that training programmes should be evaluated frequently so that necessary improvement may be made in it from time to time. Hackett (1996) concurs that every element of a training programme must be considered to ensure that training happens according to plan and with the desired results. There must be specific and realistic learning objectives, a clear learning sequence, varied and appropriate learning methods, a suitable location far from extraneous activity during the training period and one that allows variable seating, competent and knowledgeable trainers and adherence to the training schedule.

According to Kirkpatrick (2009) there are four levels of evaluating training programmes. Level one measures Reaction; how your trainees reacted to the training. Obviously, you want them to feel that the training was a valuable experience, and you want them to feel good about the instructor, the topic, the material, its presentation, and the venue. Level two measures learning; what your trainees have learned. How much has their knowledge

increased as a result of the training? Level three measures Behavior, at this level, you evaluate how far your trainees have changed their behavior, based on the training they received. Specifically, this looks at how trainees apply the information. Level four measures Results. At this level, you analyze the final results of your training. This includes outcomes that you or your organization have determined to be good for business, good for the employees, or good for the bottom line. Nzuve (2010) agrees that the criteria for evaluating training programmes are determined by the training objective. Many training programmes try to accomplish several objectives such as behavior change and provision of new information. Some of the criteria for evaluating training programmes are reaction, learning, behavior and results. Cole (2002) identified a number of evaluation strategies that are linked to training effects. Training can bring about a chain of reactions in the organization that at each key stage an evaluation strategy can be selected. For instance, training-centered, reaction-centered, learning-centered, job-behavior related organization development and cost-benefit analysis.

For training to be successful, the employee perception is crucial in that the trainees must want to learn, they should recognize their own deficiencies and perceive the training offered as relevant for remedying personal shortcomings (Cole, 2002). The programme should be steady, progressive and not exceed the intellectual capacity of employees. Participants' progress should be regularly monitored and trainees should be able to assess how well they are doing. Training methods should be varied, interesting and require active contributions from course participants (Bennet, 1994). For a training programme to be effective, it must be perceived as useful and available by employees who seek it (Price et al., 2005). It is important to know that favorable comment from trainees need not

indicate an effective programme, enjoyable and popular courses are not necessarily the best (Bennet, 1994).

Effective training programme should deliver results. There should be improved output levels, better quality of production and less time taken to complete tasks though the payoffs to investments in training might not be immediately apparent. Other intangible benefits not measureable in purely financial terms include improved morale, better personal relationships and greater attachment to the firm (Bennet, 1994). In view of the foregoing, we can conclude that for training to be effective, it presupposes effective selection, effective supervision and an appropriate management style, the opportunity to transfer learning to the workplace, career paths and promotional possibilities, appropriate incentives and rewards. It also presupposes some degree of planning and linkage to the strategy of the organization, and is, therefore, implicit within the Organizational Development (OD) (Beardwell & Holden, 1997).

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents the research methodology that was used by the study. This chapter covers the research design, target population, sample design, data collection and data analysis and presentation.

### **3.2 Research Design**

The study used the descriptive survey research design. This design was appropriate for the study since it helped to understand the situation on the ground. Also the survey design gives an accurate account of a particular situation. It can be used to describe possible behavior, attitudes and values. It is also a suitable method of collecting information by administering questionnaire of which the findings can be generalized because the population is too large to observe directly.

### **3.3 Target Population**

The target population was the science and mathematics teachers in public secondary schools in Kiambu County. The total number of these schools was 218. The population was 872 science and mathematics teachers.

### **3.4 Sample Size and Sampling Design**

Twenty percent (20%) of the schools (218) schools were selected i.e. 44 schools. Four teachers per school were picked from those teaching biology, chemistry, physics and

mathematics giving a total of 176 teachers. Hence the sample size of the study was 176 teachers. Convenience sampling was used to pick these schools.

### **3.5 Data Collection**

Primary data was collected by use of questionnaires consisting of both open-ended and closed-ended questions. These questionnaires consisted of two sections. Section one provided teacher's profile/demographic information. Section two covered the perception on the effectiveness of SMASE training program.

### **3.6 Data Analysis**

Data was checked for completeness and accuracy before analysis. Teachers' responses were coded. Descriptive statistics; percentages and frequency tables were used to analyze the various responses of the teachers on the perception of the effectiveness of Strengthening Mathematics and Science Education (SMASE) training program. Presentation of findings was by frequency tables, mean and standard deviation.

## CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

### 4.1 Introduction

This chapter presents the data analysis, interpretation and presentation of the study that was on perception of Mathematics and Science public secondary school teachers on the effectiveness of the Strengthening Mathematics and Science Education (SMASE) training program in Kiambu County. The analysis has been presented with regard to the various aspects that were sought from the study questionnaire; reaction to SMASE training, what learnt from SMASE training, change of behavior since SMASE training and, results after SMASE training.

### 4.2 Response Rate

The study targeted a total of 176 respondents who constituted of Mathematics and Science teachers from Kiambu County. A total of 176 questionnaires were therefore distributed. Out of these, 152 questionnaires received responses, as shown in Table 4.1.

**Table 4.1: Respose Rate**

|               | Frequency | Percentage |
|---------------|-----------|------------|
| Responded     | 152       | 86         |
| Not responded | 24        | 14         |
| Total         | 176       | 100        |

**Source: Author (2013)**



The table above shows that there was 86% response rate. This response rate was adequate for data analysis and conforms to Mugenda and Mugenda (2003) stipulation that a response rate of 70% and over is excellent.

### 4.3 Demographic Information of the Respondents

This section presents demographic information of the respondents. The information presented here includes gender, teaching experience and the teaching subjects.

#### 4.3.1: Gender of Respondents

The study sought to establish the gender of the respondents. Gender was important in this study because it will enable us to deduce how the different genders perceive the effectiveness of SMASE training program, as illustrated in Table 4.2.

**Table 4.2: Gender of Respondents**

|        | Number | Percentage |
|--------|--------|------------|
| Male   | 87     | 56         |
| Female | 69     | 44         |
| Total  | 156    | 100        |

**Source: Author (2013)**

According to the analysis results obtained above, the study found out that majority of the respondents were male as shown by 56% while the rest were female respondents as shown by 44% respectively. This implies that the respondent was keen enough towards achieving almost equal opinion counts from all gender evading a gender bias scenario.

### 4.3. 2: Teaching Experience

The study sought to establish the teaching experience of the teachers. This is important in determining whether the respondent have been there long enough to give accurate responses. It is also important as it influences perception of the effectiveness of SMASE training program. The findings were presented in Table 4.3.

**Table 4.3: Teaching Experience**

|               | <b>Frequency</b> | <b>Percentage</b> |
|---------------|------------------|-------------------|
| 0-5 years     | 32               | 21                |
| 6-10 years    | 69               | 44                |
| 11-15 years   | 33               | 21                |
| Over 16 years | 22               | 14                |
| <b>Total</b>  | <b>156</b>       | <b>100</b>        |

**Source: Author (2013)**

From the findings above, the study established that majority of the respondents had an teaching experience of between 6-10 years as shown by 44%, 0-5 years or 11-15 years as shown by 21% and over 16 years as shown by 14% respectively. Therefore, the teachers were in the teaching profession long enough to be in a position to give relevant information as sought by the study.

### 4. 3.3: Respondents teaching subjects

Besides, respondents were to indicate their teaching subjects. This was important so as to ensure that the respondents were the targeted group and gave the correct data. Also it was

to ensure that all the targeted subjects were covered. The findings were as shown in the Table 4.4.

**Table 4.4: Respondents Teaching Subjects**

|             | Frequency | Percentage (%) |
|-------------|-----------|----------------|
| Mathematics | 37        | 24             |
| Chemistry   | 42        | 27             |
| Biology     | 44        | 28             |
| Physics     | 33        | 21             |

**Source: Author (2013)**

From the Table 4.4 above, majority of the respondents indicated that they taught biology as their teaching subjects as shown by 28%, chemistry as shown by 27%, mathematics as shown by 24% and physics as shown by 21% respectively. In this case all the targeted subjects; mathematics, biology, chemistry, and physics.

#### **4.4 Perception on the Effectiveness of SMASE Training Program**

This study sought to establish the perception of Mathematics and Science public secondary school teachers on the effectiveness of the Strengthening Mathematics and Science Education (SMASE) training program in Kiambu County. To achieve on the objectives of the study, the study used a 5-likert scale where 1 was strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree. Since the scale ranged from 1 to 5, therefore means that the mean score of a given statement is guided by the following that;  $1 \leq x \leq 5$ . An expansion of the intervals give a range of the type;

1≤1.5<2.5<3.5<4.5≤5. Where 1≤1.5 strongly disagree, 1.5≤2.5 disagree, 2.5≤3.5 Neutral, 3.5≤4.5 agree, 4.5≤5 Strongly agree respectively. There are four levels of evaluating training were considered in analyzing SMASE training program. These levels are: Reaction, Learning, Behavior and Results.

#### 4. 4.1: Reaction to the SMASE training program

The study required the respondents to indicate their level of agreement on statements related to reaction which is the first level of evaluation with regard to the SMASE training program. The results are as shown in Table 4.5.

**Table 4.5: Reaction to the SMASE training program**

|   | Mean | St. Deviation |
|---|------|---------------|
| Attending the trainings is usually worth my time.                 | 3.75 | 0.92          |
| The topics taught in the training are applicable during teaching. | 3.87 | 0.98          |
| The trainers are usually well prepared                            | 3.85 | 0.97          |
| The objectives are clear  | 3.89 | 0.99          |
| There is clear linkage of objectives to education goals           | 4.21 | 1.16          |
| There is feedback and implementation of teacher's suggestions     | 4.20 | 1.16          |
| Teachers are involved in choosing the training topics             | 4.02 | 1.06          |
| The trainings are usually a Success.                              | 3.74 | 0.92          |
| I like the venues and presentation of topics                      | 3.75 | 0.92          |

Source: Author (2013)

According to the results displayed in the table above, majority of the respondents were in agreement that, attending the trainings is usually worth their time as shown by a mean score of 3.75, the topics taught in the training are applicable during teaching as shown by a mean score of 3.87, the trainers are usually well prepared as shown by a mean score of 3.85, the objectives of the training are clear shown by a mean score of 3.89, there is a clear linkage of objectives to education goals as shown by a mean score of 4.2, there is feedback and implementation of teacher's suggestions as shown by a mean score of 4.2, teachers are involved in choosing the training topics as shown by a mean score of 4.02, the trainings are usually a success shown by 3.74 and that they like the venues and presentation of topics as shown by the mean score 3.75 respectively. The findings reveal that there is a positive relationship on the perception of respondents on and the reaction of SMASE Training Program in that; attending the trainings is usually worth their time, the topics taught in the training are applicable during teaching, the trainers are usually well prepared, the objectives of the training are clear, there is a clear linkage of objectives to education goals, there is feedback and implementation of teacher's suggestions, teachers are involved in choosing the training topics and that they like the venues and presentation of topics.

#### **4.4.2: Learning after the SMASE training program**

The respondents were required by the study to indicate their level of agreement on statements related to learning the second level of evaluation with regard to the SMASE training program.

**Table 4.6: Learning after the SMASE training program**

|   | Mean | St. Deviation |
|---|------|---------------|
| I can now involve the students more during teaching.          | 3.92 | 1.01          |
| I have been able to learn how to use varied teaching methods. | 3.89 | 0.99          |
| It is now easier to present concepts during teaching.         | 3.96 | 1.03          |

**Source: Author (2013)**

On this question, the study revealed that majority of the respondents were in agreement that: Mathematics and Science teachers can now involve the students more during teaching as shown by a mean score of 3.92, Mathematics and Science teachers have been able to learn how to use varied teaching methods as shown by a mean score of 3.89 and that it is now easier to Mathematics and Science teachers to present concepts during teaching as shown by a mean score of 3.96 respectively. The findings reveal that there is a positive relationship on the perception of respondents on the learning in SMASE Training Program in that; Mathematics and Science teachers can now involve the students more during teaching, Mathematics and Science teachers have been able to learn how to use varied teaching methods and that it is now easier to Mathematics and Science teachers to present concepts during teaching.

### 4.4.3: Behavior after the SMASE training program

On a five likert scale, the research study sought the respondents level of agreement on statements related to behavior the third level of evaluation with regard to the SMASE training program. The results are as shown below.

**Table 4.7: Behavior after the SMASE training program**

|   | Mean | St. Deviation |
|---|------|---------------|
| I was able to put to use what I learned in the training.                        | 4.35 | 0.71          |
| SMASE training program makes me more effective in my work                       | 3.56 | 0.82          |
| I was able to teach the new skills, knowledge and attitude to other colleagues. | 3.64 | 0.86          |
| I am aware that I have changed my teaching approaches.                          | 3.72 | 0.90          |

**Source: Author (2013)**

The results displayed in the table above revealed that majority of the respondents strongly agreed that; Mathematics and Science teachers were able to put to use what they learnt in the training as shown by mean score of 4.35, SMASE training program makes them more effective in their work as shown by 3.56, they were able to teach the new skills, knowledge and attitude to other colleagues as shown by 3.64 and they are aware that they have changed their behavior and teaching approaches as shown by 3.72 respectively. The findings reveal that there is a positive relationship on the perception of respondents on the behavior after the SMASE Training Program in that; Mathematics and Science teachers were able to put to use what they learnt in the training, SMASE training program makes

them more effective in their work, they were able to teach the new skills, knowledge and attitude to other colleagues and they are aware that they have changed their behavior and teaching approaches.

#### 4.4.4: Results after the SMASE training program

Respondents were sought by the study to indicate their level of agreement on statements related to results the fourth level of evaluation with regard to the SMASE training program. The results were as shown below.

**Table 4.8: Results after the SMASE training program**

|   | Mean | St. Deviation |
|---|------|---------------|
| There is improvement in performance in my subject after undergoing the trainings. | 4.00 | 1.05          |
| There is change in attitude of students towards my subject(s).                    | 4.20 | 1.16          |
| I now enjoy teaching after the trainings.   | 4.12 | 1.12          |

**Source: Author (2013)**

According to the study findings, majority of the respondents were in agreement that; there is improvement in performance in their subjects after undergoing the trainings as shown by a mean score of 4.00, there is change in attitude of students towards their subject(s) as shown by a mean score of 4.20 and that; Mathematics and Science teachers can now enjoy teaching after the SMASE trainings as shown by a mean score of 4.12 respectively. The findings reveal that there is a positive relationship on the perception of respondents on the behavior after the SMASE Training Program in that; Mathematics and Science teachers were able to put to use what they learnt in the training, SMASE training



program makes them more effective in their work, they were able to teach the new skills, knowledge and attitude to other colleagues and they are aware that they have changed their behavior and teaching approaches.

#### **4.5 Factors Affecting the Effectiveness of SMASE Training Program**

In an open ended question, the study required the respondents to indicate the various factors influencing the effectiveness of the SMASE training program. On this question, majority of the respondents indicated lack of enough training materials or resources, lack of enough capacity on management to handle the large number of science and mathematics teachers, there is lack of enough skilled staff in the organization and that there is a need to introduce various outlets in all the 47 counties in Kenya. Other respondents also indicated that the SMASE training program could also incorporate the science and mathematics students directly so as to enhance the effectiveness in the same subjects multi-wise.

#### **4.6 Suggestions for Improvement of SMASE Training Program**

Respondents were required by the study to indicate suggestions for improvement of SMASE training program. On this question, the study revealed that most of the respondents were of the view that there is need to improve on the training materials, at the same time the management need to interact fully with the attendants. Some of the respondents had the view that there should be liberty whereby teachers can choose whether to attend or not, that the management should make it teacher friendly at the same time avoiding threats which would make it irrelevant.

## 4.7 Discussion

The study revealed that majority of the science and mathematics teachers were experienced and teaching more than one subject having taught for a period of 6-10 years. The study showed that majority of the respondents were in agreement that; attending the trainings is usually worth their time, the topics taught in the training are applicable during teaching, the trainers are usually well prepared, the objectives of the training are clear, there is clear linkage of objectives to education goals, there is feedback and implementation of teacher's suggestions, teachers are involved in choosing the training topics, the trainings are usually a success and that they like the venues and presentation of topics. This is in agreement with Cole (2002) that for training to be successful, the employee perception is crucial in that the trainees must want to learn, they should recognize their own deficiencies and perceive the training offered as relevant for remedying personal shortcomings

The study also found out that majority of the respondents were in agreement that: they can now involve the students more during teaching, they have been able to learn how to use and apply varied teaching methods and that it is now easier for them to present concepts during teaching respectively. Betts (2000) also confirms on the effectiveness of learning, that to be effective, these learning activities must be integrated and applied at all organizational levels in a continuous development program. Armstrong (2006) also revealed that training is the use of systematic and planned instructions activities to promote learning and that it involves the use of formal processes to impart knowledge and help people to acquire the skills necessary for them to perform their jobs satisfactorily.

The results of the study also found out that majority of the respondents strongly agreed that; they were able to put to use what they learnt in the training, SMASE training program makes them more effective in their work, they were able to teach the new skills, knowledge and attitude to other colleagues and they are aware that they have changed their behavior and teaching approaches. The results on behavior change agree with the argument presented by Beardwell & Holden (1997) that training is a planned process to modify attitude, knowledge or skills behavior through learning experience to achieve effective performance in an activity or range of activities.

The study found out that majority of the respondents were in agreement that; there is improvement in performance in their subjects after undergoing the trainings, there is change in attitude of students towards their subject(s) and that; they can now enjoy teaching after the SMASE trainings. The findings were therefore in line with Bennet (1994) who asserts that effective training programme should deliver results and that there should be improved output levels, better quality of production and less time taken to complete tasks though the payoffs to investments in training might not be immediately apparent.

# **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

## **5.1 Introduction**

This chapter presents the summary of the findings, conclusions and recommendations of the study on on perception of Mathematics and Science public secondary school teachers on the effectiveness of the Strengthening Mathematics and Science Education (SMASE) training program in Kiambu County. The data is based on the aspects on the effectiveness of the SMASE training program.

## **5.2 Summary**

The general objective of this study was to establish the perception of mathematics and science public secondary school teachers on the effectiveness of SMASE training program. A population of one hundred and seventy six respondents was drawn from all the teachers in Kiambu County. For the purpose of collecting data, the researcher developed and administered a questionnaire and the results obtained were analyzed using Microsoft Excel and Statistical Package for Social Sciences (SPSS).

Study findings indicated that males were more than females with a small difference and therefore this implies that the respondent was keen enough towards achieving almost equal opinion counts from all gender evading a gender bias scenario. The findings also showed that majority of the respondents had a teaching experience good enough and they were therefore in the teaching profession long enough to be in a position to give relevant information as sought by the study. Also the study findings showed the number of

teachers teaching mathematics, biology, chemistry and physics clearly indicating that all the targeted subjects were covered.

The findings revealed that there is a positive relationship on the perception of respondents on and the reaction of SMASE Training Program in that; attending the trainings is usually worth their time, the topics taught in the training are applicable during teaching, the trainers are usually well prepared, the objectives of the training are clear, there is a clear linkage of objectives to education goals, there is feedback and implementation of teacher's suggestions, teachers are involved in choosing the training topics and that they like the venues and presentation of topics. The findings revealed that there is a positive relationship on the perception of respondents on the learning in SMASE Training Program in that; Mathematics and Science teachers can now involve the students more during teaching, Mathematics and Science teachers have been able to learn how to use varied teaching methods and that it is now easier to Mathematics and Science teachers to present concepts during teaching.

The findings further showed that there is a positive relationship on the perception of respondents on the behavior after the SMASE Training Program in that; Mathematics and Science teachers were able to put to use what they learnt in the training, SMASE training program makes them more effective in their work, they were able to teach the new skills, knowledge and attitude to other colleagues and they are aware that they have changed their behavior and teaching approaches. Also the findings indicated that there is a positive relationship on the perception of respondents on the behavior after the SMASE Training Program in that; Mathematics and Science teachers were able to put to use what they

learnt in the training, SMASE training program makes them more effective in their work, they were able to teach the new skills, knowledge and attitude to other colleagues and they are aware that they have changed their behavior and teaching approaches.

It was revealed from the study that majority of the respondents indicated lack of enough training materials or resources, lack of enough capacity on management to handle the large number of science and mathematics teachers, there is lack of enough skilled staff in the organization and that there is a need to introduce various outlets in all the 47 counties in Kenya. Other respondents also indicated that the SMASE training program could also incorporate the science and mathematics students directly so as to enhance the effectiveness in the same subjects multi-wise.

### **5.3 Conclusions**

Following the study findings we can conclude that the SMASE training program is effective. This is because the findings revealed that there is a positive relationship on the perception of respondents on their reaction towards SMASE training program, they agreed that learning took place after the training, that there was a change in their behavior after the training and also agreed that there were good results after the training. Also the response from majority of the statements attracted a mean score of between 3.1 and 4.2 which implies that the mathematics and science teachers agree that the SMASE training program is effective.

## 5.5 Recommendations

This study recommends that the science and mathematics teacher retain the same motive and spirit towards attending the SMASE training for it is worth and of value. The study also recommends that the teachers be keen when choosing topics to be incorporated in the program to only pick those that will rather solve challenges in their duty of teaching the science and mathematics subjects. There is a need to also involve students when deciding which topics should be trained in the program so that students' problems are also addressed as teachers will gain approaches to dealing with them.

This study recommends that the SMASE program managers seek new strategies on how they can include smaller programs for science and mathematics students from the various schools. This will help them learn new concepts which they can as well share with the rest. The study recommends that representative students be picked every other time disregard of their performance in the same subjects for this, when shared, will help in reinforcing what the teachers learn from the SMASE program making it simple to implement.

This study recommends that teachers accept that the SMASE training program is effective and there is a need to change the attitude and behavior towards the same. This will see to it that they value the program at all times for its effectiveness in shaping the approaches they use in teaching as well as the approaches they use to change the behavior of students towards the science and mathematics teachers.

On results of the SMASE training program, the study recommends that proper measures of performance be put in place and that the right strategies be used to ensure their implementation. Proper evaluation measures of performance or results obtained from the science and mathematics subjects be used for this will help establish whether concepts learnt in the SMASE training program have been applied or not. Performance of the students in the said subjects should be used to evaluate the effectiveness of the SMASE training program all through.

### **5.5 Recommendations for Further Studies**

This study recommends that further studies be done where many schools are involved from the various counties. This will be in an effort to establish whether the same results on the effectiveness of the SMASE training program will be obtained. The studies to be conducted should incorporate various issues that regard to the SMASE training program so as to fully address the challenges towards the same. This study requested to know the factors that influence the SMASE training program but did not explain their effect. Further studies need to establish the effect of the said factors towards the effectiveness of the SMASE training program or other training programs.



## REFERENCES

- Armstrong, M. (2006). *A Handbook of Human Resource Management Practice, 10<sup>th</sup> Edition*. London: Kogan Page Ltd.
- Barber, P. J. and Legge D. (1976). *Perception and Information*. London: Methuen.
- Beardwell, I. et al. (1997). *Human Resource Management. A contemporary approach*. England: Pearson Education Ltd.
- Betts, P.W. (2000). *Supervisory Management, 7<sup>th</sup> Edition*. England: Pearson Education Ltd.
- Balkin, B. et al. (1999). *Managing Human Resources, 6<sup>th</sup> Edition*. New Jersey, U.S.A: Pearson Education, inc.
- Bennet, (1994). *Management*. London: Pitman Publishing.
- Bennet, R. & Graham, H.T. (1998). *Human Resource Management*. Great Britain: Pearson Professional Ltd.
- Booth, A.L. & Shower, D. J (1996). *Acquiring Skills, Market Failures, their symptoms and policy responses*. Great Britain: University Press.
- Cascio, W. F. (2000). *Managing Human Resources- Productivity, Quality of work, Profits, 8<sup>th</sup> edition*. New York: McGraw-Hill Irwin.
- Cole, G. A. (2008). *Personnel and Human Resource Management, 5<sup>th</sup> Edition*. London.
- Cole, G. A. (2002). *Organizational Behavior*. London.
- Cole, G. A. (1997). *Personnel Management: Theory and Practice 4<sup>th</sup> edition*. London: Letts Aldine.
- Crane, P. D. & Miner, J. B. (1995). *Human Resource Management. The Strategic Perspective*. U.S.A: HaperCoins College Publishers.
- Daft, L. (2000). *Management. 5<sup>th</sup> edition*. Dryden press.

- Decenzo, D. and Robbins, S.P (2010). *International Student Version*. John Wiley & Sons Pre Ltd. Asia.
- Dessler, G. (2005). *Human Resource Management, 10<sup>th</sup> edition*. Pearson Education Inc.
- D.E.O office kikuyu- *SMASE Training Programme*.
- Dowling et al. (2005). *International Human Resource Management, 5<sup>th</sup> edition*. U.K.
- Education in Kenya (2011); *Secondary Education in Kenya*. [www.education in Kenya.com](http://www.education in Kenya.com).
- Employee Perception (2010); *Factors affecting employees' perception*. [www.wisgeek.com](http://www.wisgeek.com)
- Kirkpatrick, D.L. (2009). *Evaluating Training Programmes, 3<sup>rd</sup> edition*. Berrett-Koehler Publishers.
- Gakuru, B.W. (2006). *Relationship between Training Practices and Performance*. Nairobi: Kenya
- Gibson, D. & Ivancevich, (1992). *Fundamentals of Management*. U.S.A.
- Gomez-Mejia et al(2010). *Managing Human Resources*. Pearson Education Inc: New Jersey.
- Hackett, P. (1996). *Managing People*. Singapore: Biddles Ltd.
- Harrison, R. (1993). *Employee Development*. London: Institute of Personnel Development
- Khanka, Dr. S.S (2011). *Human Resource Management (text and cases)*. S. Chand & Company Ltd: New Delhi, India.
- Maina, N. J (2006). *Training and Development Practices in the State Corporations*. Nairobi, Kenya.

- Mama, C. N. (2009). *An investigation of the effectiveness of SMASE training in Thogoto zone Kiambu west District*. Nairobi.
- Mcshane & Von (2008). *Organizational Behaviour, 4<sup>th</sup> Edition*. McGraw –Hill Int: USA
- Memonia & Pereck (1984). *Personnel Management*. Himalayas. Publishing House: New Delhi.
- Nair and Rao. (2000). *Excellence through Human Resource Development*.
- Nzuve, S.N.M. (2010). *Management of Human Resources. A Kenyan Perspective. Revised 4<sup>th</sup> Edition*. Tech & ProAssociates Publishers: Nairobi, Kenya.
- Nzuve, S.N.M & Singh (1992). *Introduction – to Manpower Management*. Silver Bites: New Delhi
- Okumbe, J. A. (2001). *Human Resource Management- An Educational Perspective*. Educational Development & Research Bureau: Nairobi, Kenya.
- Odhiambo, C. A. (2011). *Perception of Employees of K.P.L.C Ltd on the Effectiveness of Training and Development*. Nairobi , Kenya.
- Paauwe, J. and Richard, M. (1997). *Introducing Special Issues on Human Resource Management and Performance, the International Journal of Human Resource Management*. 3:260.
- Pettinger, R. (2002). *Mastering Employee Development*. Palgrave.
- Price A. (2007). *Human Resource Management- in Business context 3<sup>rd</sup> edition*. London.
- SMASE Training Program (2009); *SMASE Kenya*. www. SMASE. com
- Stewart, J. & Mcgoldrick, J. (1996). *Human Resource Development, perspective, strategies and practice*. Pearson Professional Ltd: Great Britain.
- Strudey, R. (2012). *Training and Development*. The University of Edinburg.

Trainingindustry.com – *Training Best Practices & Organizational Success.*

Training. (2011); *employee training.* www.employee training.com.

Tyson S. (2008). *Essentials of Human Resource Management, 5<sup>th</sup> Edition.* Elsevier Ltd:  
U.S.A.

Tyson, S. and York, A. (1996). *Human Resource Management, 3<sup>RD</sup> edition.* British  
Library Cataloguing in Publication Data: Britain.

Walton, J. (1999). *Strategic Human Resource Development.* Pearson Education Ltd:  
Great Britain.

## APPENDICES

### APPENDIX 1: QUESTIONNAIRE

Dear Participant, This questionnaire is part of a research project I am undertaking in public schools in Kiambu County on the perception of secondary school mathematics and science teachers on the effectiveness of SMASE training programme. Any information provided is confidential. You are not required to give your name nor the school you are in. Kindly tick in the appropriate box.

Thank you in advance.

#### SECTION 1: TEACHER'S PROFILE

1. What is your gender?  
Male            ( )  
Female         ( )
  
2. What is your teaching experience?  
0-5 years ( )  
6-10 years ( )  
11-15 years ( )  
Over 16 years. ( )
  
3. Which subject(s) do you teach?  
Mathematics ( )  
Chemistry ( )  
Biology ( )  
Physics ( )

## SECTION 2: PERCEPTION ON THE EFFECTIVENESS OF SMASE TRAINING PROGRAM.

4. To what extent do you agree with the following statements with regard to the SMASE training program? Rate using the scale of 1-5.

1 -strongly disagree, 2-disagree, 3-neutral, 4-agree, 5-strongly agree.

|   | Strongly Disagree<br>1 | Disagree<br>2 | Neutral<br>3 | Agree<br>4 | Strongly Agree<br>5 |
|---|------------------------|---------------|--------------|------------|---------------------|
| SMASE training program makes me more effective in my work         |                        |               |              |            |                     |
| Teachers are involved in choosing the training topics             |                        |               |              |            |                     |
| The topics taught in the training are applicable during teaching. |                        |               |              |            |                     |
| The trainers are usually well prepared.                           |                        |               |              |            |                     |
| The objectives are clear  |                        |               |              |            |                     |
| There is clear linkage of objectives to education goals           |                        |               |              |            |                     |
| There is feedback and implementation of teacher's suggestions     |                        |               |              |            |                     |
| Attending the trainings is usually worth my time.                 |                        |               |              |            |                     |
| I like the venues and presentation of topics                      |                        |               |              |            |                     |
| The trainings are usually a Success.                              |                        |               |              |            |                     |
| I have been able to learn how to use varied teaching methods.     |                        |               |              |            |                     |

|   |  |  |  |  |  |
|---|--|--|--|--|--|
| I can now involve the students more during teaching.                              |  |  |  |  |  |
| It is now easier to present concepts during teaching.                             |  |  |  |  |  |
| I was able to put to use what I learned in the training.                          |  |  |  |  |  |
| I was able to teach the new skills, knowledge and attitude to other colleagues.   |  |  |  |  |  |
| I am aware that I have changed my teaching approaches.                            |  |  |  |  |  |
| There is improvement in performance in my subject after undergoing the trainings. |  |  |  |  |  |
| There is change in attitude of students towards my subject(s).                    |  |  |  |  |  |
| I now enjoy teaching after the trainings.   |  |  |  |  |  |

5. Please indicate any other factors which affect the effectiveness of SMASE training program

a).....

b) .....

c).....

**6** What are your suggestions for improvement of SMASE training program?

a).....

b).....

c).....

**7** Any other comments regarding SMASE training program.

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**UNIVERSITY OF NAIROBI**  
**SCHOOL OF BUSINESS**  
**MBA PROGRAMME**

Telephone 020-2059162  
Telegrams: "Varsity", Nairobi  
Telex: 22095 Varsity

P.O. Box 30197  
Nairobi, Kenya

DATE 20/09/13.....

**TO WHOM IT MAY CONCERN**

The bearer of this letter PERIS WANJIRU GACHU.....

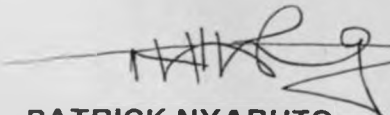
Registration No. B61/015/2/2010.....

is a bona fide continuing student in the Master of Business Administration (MBA) degree program in this University.

He/she is required to submit as part of his/her coursework assessment a research project report on a management problem. We would like the students to do their projects on real problems affecting firms in Kenya. We would, therefore, appreciate your assistance to enable him/her collect data in your organization.

The results of the report will be used solely for academic purposes and a copy of the same will be availed to the interviewed organizations on request.

Thank you.

  
**PATRICK NYABUTO**  
**MBA ADMINISTRATOR**  
**SCHOOL OF BUSINESS**

