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# Mathematics and Science Teachers' Perception and Expectation of SMASSE in-Service Training in Kenya

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## 1.0 ABSTRACT.

This is a report of an academic study that was conducted in NAROK COUNTY of Rift-Valley province – Kenya in 2014. The purpose of this study was to identify mathematics and science teachers' perception and expectations of SMASSE in-service training. The accessible sample was teachers of Mathematics and Sciences who were undergoing SMASSE in-service training from randomly selected schools. All teachers of Mathematics and Sciences undergoing SMASSE in-service training from the selected schools were used as respondents.

The study was guided by a Model of Stages in the Innovation Decision Process as conceptualized by Rogers in 1983. The design for this study was survey. A trainees' questionnaire and interview schedule for COUNTY Quality Assurance and Standards Officer and principal of SMASSE INSET center were data collection instruments. Data collected was analyzed using both descriptive (frequencies and percentages) and inferential statistics (Chi-square).

The study found out that SMASSE goals may not be achieved because of some concerns about class sizes and teachers' workload. Teachers' welfare during the training is not catered for and the organization and location of the training center need to be decentralized for convenience.

The study recommends inclusion of all stakeholders in designing, organizing and running of the teachers' in-service training.

## 2.0 Background of the study.

The Strengthening of Mathematics and Science in Secondary Education (SMASSE) Project was started in Kenya in 1998. This was in response to the poor performance by students at Kenya Certificate of Secondary Education (KCSE) examinations in Mathematics, Biology, Physics and Chemistry. Reports from the Kenya National Examinations Council (KNEC) indicate for instance that in Mathematics the average mark



obtained by candidates between 1999 and 2003 was below 20%. A similar trend has been exhibited in physics and chemistry. In physics the problem of poor performance was also coupled by dwindling numbers of candidates taking the subject. In 2002 only 54,180 out of 197,090 representing 27% of the total candidature did physics while in 2003, 55,877 candidates out of 207,730 candidates, representing 26.8% of the total candidature sat for physics. (KNEC: 2003).

Stakeholders in education in Kenya especially educationists and the SMASSE baseline studies of 1998 have attributed the poor performance in mathematics and sciences to several factors ranging from the abstract nature of the subjects, the attitude of the teachers, learners and the community about the subjects, poor syllabus coverage, inappropriate teaching and learning methods and lack of basic teaching and learning resources (SMASSE Home Page 2005).

Alarmed by the poor performance in these subjects, the Kenya Government felt that the prospect of

having Kenya become a newly industrialized nation by the year 2020 was in jeopardy. Thus it sought assistance from the Japanese Government on the possible remedy to the situation. The Japanese government was better placed for this because their new education system in Mathematics and Science was better than other countries as revealed in a series of International Mathematics and Science Studies (IMSS).

SMASSE project is a joint venture between the Ministry of Education (MOE) - Kenya and the Japanese International Cooperation Agency (JICA). Based on the baseline studies conducted at the onset of SMASSE in 1998, the project was geared to address the following factors deemed to affect the performance of Mathematics and Sciences.

- Attitudinal factors
- Teaching Methodology
- Mastery of Content
- Professional Interaction for a teacher
- Development of teaching/learning materials and
- Administrative factors. (MOE, 1998).



These factors were to be addressed through in-service training of Mathematics and Science teachers in the whole country.

### 3.0 Statement of the Problem

Mathematics and Sciences are regarded as cornerstones in a bid to attain technological advancement and thereby industrialization. Poor performance at K.C.S.E. in these subjects has drawn concern from various stakeholders. This is a handicap towards realizing the national development goal of industrialization by 2020.

The government of Kenya in liaison with the Japanese government through J.I.C.A. came up with SMASSE project to remedy the situation. The project seeks to strengthen the teaching and learning of Mathematics and Sciences in the secondary school through increased practical activity, improvisation of learning resources and preparation of lessons that are learner-centered as opposed to the teacher-centered as has been in practice.

The greatest challenge to SMASSE was reported during COUNTY INSETs across the country where participants threatened to boycott the training, went on strike or demonstrated against the training on the one hand. The teachers' unions on the other hand strongly spoke against its organization and the welfare of the participants during the training. Since Mathematics and Science teachers are very important in the adoption and the actual implementation of the programme on the ground, it is important to consider their perceptions and expectations of SMASSE INSET since this can affect the adoption and implementation of the project

On the importance of receivers' perception of an innovation Rogers (1983) says;

“It is the receivers' perception of the attributes of innovations, not the attributes as classified by experts or change agents that affect their rate of adoption”.

Hence the major aim of the study was to investigate the Science and Mathematics teachers' perception and expectation of SMASSE in-service training. Specifically the objectives of the study were:



1. To investigate the perceptions and expectations of Mathematics and Science teachers towards goals of SMASSE.
2. To determine what the Mathematics and Science teachers perceive and expect of the organization and location of the training.
3. To find out what Mathematics and Science teachers perceive and expect of the provision of their welfare during SMASSE INSET.
4. To determine what the Mathematics and Science teachers perceive and expect of attributes to consider in selecting SMASSE trainers.

### 5.0 Justification of the study

Several authors of education related literature have written in support of teachers' in-service training .Shiundu and Omulando (1992:233) say;

In-service training is justified because of the explosion in knowledge and the need to have teachers keep abreast of new developments in knowledge. No teacher can claim to be fully equipped in knowledge sufficient to last him through his teaching career.

As much as it is important to enable teachers undergo in-service training, it is equally important to consider their perceptions and expectations in

organizing the training. When this is captured, it will enhance their rate of adoption of an innovation. Stressing on this Rogers (1983) notes;

“It is the receivers' perception of the attributes of innovations, not the attributes as classified by experts or change agents that affect their rate of adoption”

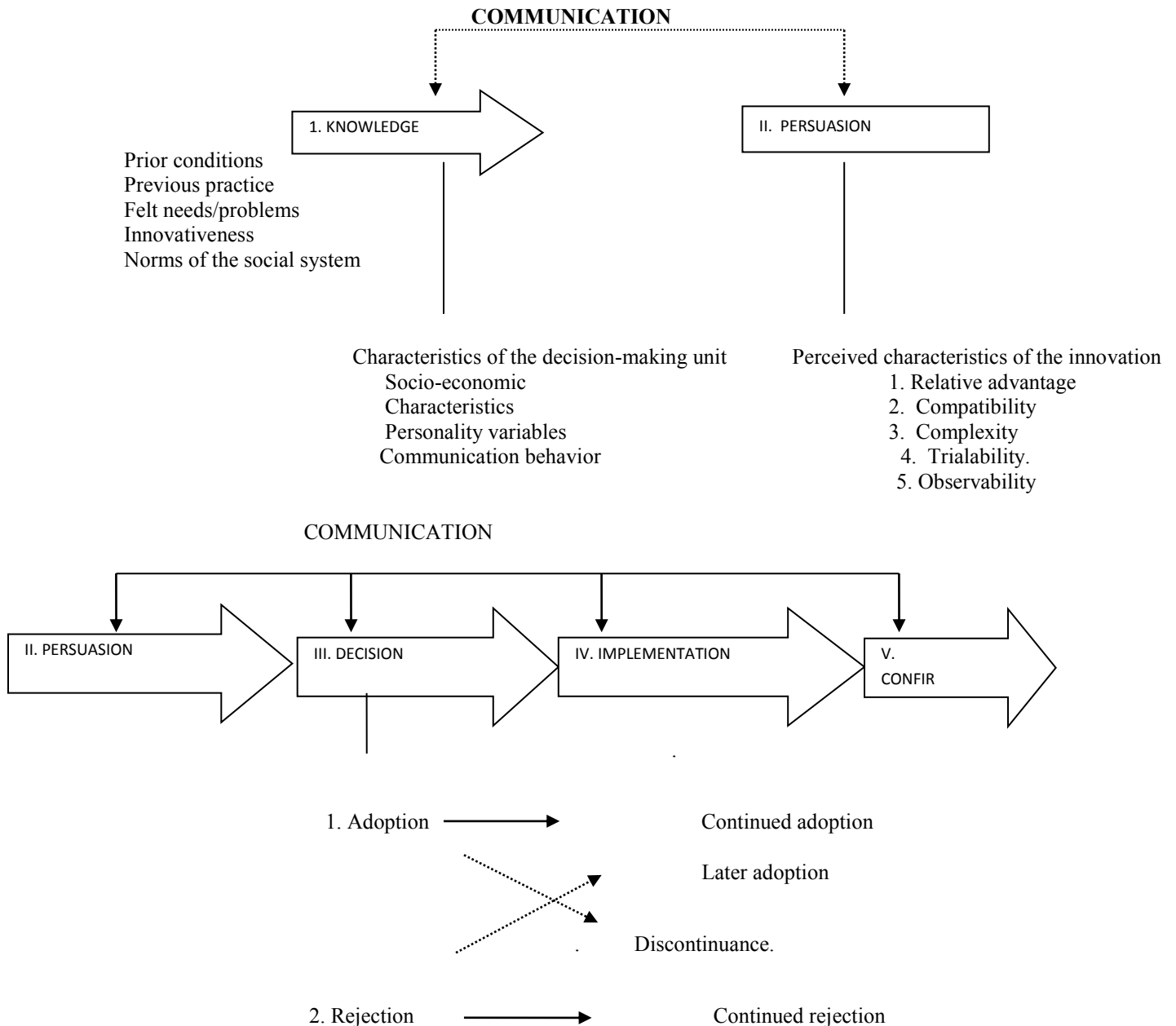
The study was therefore justified on grounds that there is very little research on in-service training in Kenya. The study also seeks to find out why teachers are neither willing nor enthusiastic about SMASSE project as frequently reported in media.

### 6.0 Conceptual Framework

The study was guided by a Model of Stages in the Innovation Decision Process as conceptualized by Rogers E. (1983). He defines innovation-decision process as the process through which an individual (or other decision-making unit) passes from just knowledge of an innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea and to

confirmation of this decision. The model can be presented diagrammatically as shown below.

**Model of stages in Innovation decision process.**



.Fig. 1: Model of stages in the Innovation Decision Process. (Rogers: 1983)



The model identifies 5 stages in the innovation - decision process. These are:-

- Knowledge which entails information on prior conditions, previous practice, felt needs, innovativeness and norms of the social system.
- Perceived characteristics of the innovation entail relative advantage, compatibility, complexity, trialability and observability.
- Decision stage is where a decision is made whether to adopt or reject an innovation.
- Implementation is characterized by continued adoption, later adoption, discontinuance or continued rejection.
- Confirmation stage is where an innovation is taken to be the norm or declared as a flop.

The innovation decision process is discussed below; Rogers highlights a five stage process of making a decision on an innovation, that is, to either adopt or reject it. The first stage is the knowledge which commences when the individual (or other decision-making unit) is

exposed to the innovation's existence and gains some understanding of how it functions. Knowledge of an innovation can arise from previous practice or felt needs/problems. Roger (1983) identifies two types of knowledge about an innovation as software information which is embodied in an innovation and serves to reduce uncertainty about the cause-effect relationships that are involved in achieving a desired outcome and principles knowledge which consists of information dealing with the functioning principles underlying how the innovation works.

The second stage is persuasion where the individual forms a favorable or unfavorable attitude toward the innovation. At this stage the individual is more psychologically involved with the innovation: he or she actively seeks information about the new idea. Here, selective perception is important in determining the individual's behavior at the persuasion stage, for it is at this stage that a general perception of the innovation is developed.



An individual is motivated at the persuasion stage to seek innovation - evaluation information which is the reduction in uncertainty about an innovation's expected consequences. Here an individual usually wants to know the answers to such questions as; "what will its advantages and disadvantages be in my situation?" Answers to these questions form a firm basis on making a decision on the innovation. It is assumed that the persuasion will lead to a subsequent change in behavior (that is adoption or rejection) consistent with the attitude held.

Most important at the persuasion stage are the perceived characteristics of an innovation i.e. relative advantage, compatibility, complexity, trialability and observability. These characteristics are discussed below.

- **Relative Advantage**

This is the degree to which an innovation is perceived as being better than the idea it supersedes. The degree of relative advantage can be expressed in economic profitability, in status giving or other ways. In the case of SMASSE,

improved student performance in Mathematics and Science in KCSE examinations. Relative advantage affects the rate of adoption of an innovation. It may also indicate the strength of the reward or punishment resulting from the adoption of an innovation. The sub dimensions of relative advantage include the degree of economic profitability, low initial cost, a decrease in discomfort, a savings in time and effort, and the immediacy of the reward.

The immediacy of the reward normally explains why preventive innovations have an especially low rate of adoption. A preventive innovation is a new idea that an individual adopts in order to prevent the possibility of some unwanted future event. Sometimes incentives are used to speed up the rate of adoption especially in preventive innovations.

### **Compatibility**

This is the degree to which an innovation is perceived as consistent with the existing values, past experiences and needs of potential adopters.



An innovation can be compatible or incompatible with socio-cultural values and beliefs, previously introduced ideas or client needs of innovations.

Compatibility can be affected by;-

- Technology clusters; - This consists of one or more elements of technology that are perceived as being closely related.
- Naming an innovation; - The selection of a name of innovation is a delicate and important matter because the potential adopter's perception of the name affects his/her rate of adoption.
- Positioning an innovation;- The basic assumption here is that an individual will behave toward a new idea in a manner that is similar to the way he or she behaves towards other ideas that the individual perceives as similar to the new idea.

- **Complexity**

This is the degree to which an innovation is perceived as relatively difficult to understand and use.

- **Trialability**

This is the degree to which an innovation may be experimented with on a limited basis. New ideas that can be tried on the installment plan will generally be adopted more rapidly than innovations that are not divisible.

**e) Observability**

This refers to the degree to which the results of an innovation are visible to others.

Decision making is the third stage. This occurs when an individual (or other decision-making unit) engages in activities that lead to a choice to adopt or reject an innovation. Four categories of decisions can be deduced i.e. continued adoption, later adoption, discontinuance and continued rejection.

The fourth stage is implementation which occurs when an individual (or other decision-making unit) seeks reinforcement for the innovation decision already made, but he/she may reverse this decision if exposed to conflicting messages about the innovation.





The fifth stage is confirmation where an innovation is declared to be successful or a flop.

## **7.0 RESEARCH DESIGN AND METHODOLOGY.**

### **7.1 Area of Study**

The study was conducted in Trans Nzoia COUNTY of Rift Valley province in Kenya. The COUNTY was chosen for research because the problem of poor performance in Mathematics and Sciences was more pronounced in Trans Nzoia than the neighboring Bungoma and Uasin Gishu COUNTYS. In the 2005 KCSE results the COUNTY was ranked 3<sup>rd</sup> last in the province. (DEO's office Trans Nzoia: 2006).

### **7.2 Research Population.**

The target population for this study was 270 teachers of Mathematics and Sciences in Trans Nzoia COUNTY who were attending SMASSE in-service training at St. Brigids Girls High School, (April 2004-2006 attendance record)..

### **7.3 Sampling procedures.**

The study was undertaken in 18 randomly selected schools in Trans Nzoia COUNTY. which a total of 93 teachers of Science and Mathematics formed the study sample. There was a return of eighty one (81%) questionnaires which gives a return rate of eighty seven (87%) percent.

### **7.4 Research Design**

This study adopted descriptive survey design in an attempt to establish the Mathematics and Science teachers' perception and expectation of SMASSE INSET.

### **3.5 Research Instruments.**

- **Questionnaires**

A questionnaire with both closed-ended and open-ended questions was administered to the 93 teachers while interviews were contacted to the principal of the INSET centre school and the COUNTY Quality Assurance and Standards Officer (DQASO) in-charge of SMASSE in the COUNTY in order to reinforce and confirm the responses given in the questionnaire.



## 8.0 Background Information of the Respondents.

A total of 93 teachers were involved in this study. Eighty Seven percent of the total

questionnaires were returned and used for analysis. Out of the returned responses 71.6% were males while 28.4% were females. Table 1 gives more details about respondents

Table 1 Background Information of the Respondents.

Item	Attribute.	Frequency	Percentage.
Gender	Male	58	71.6
	Female	23	28.4
Age bracket	Up to 25years	7	8.7
	26-39	40-1	50.6
	40 and above	33	40.7
Professional qualification	Untrained	7	8.7
	Certificate	2	2.5
	Diploma	27	33.3
	B.ED	31	38.3
	BA/BSC/PGDE	13	16.0
	M.ED	1	1.2
Teaching experience	Up to 5years	18	22.2
	6-15	30	37.0
	16 and above	33	40.7
Designation in the school.	Head teacher (HM)	2	2.5
	Deputy HM	3	3.7
	H o D	25	30.9
	H o S	21	25.9
	Ass.teacher.	30	37.0

From the table above, we note that majority of the respondents were male at 71.6% with females at 28.4%. On age, majority were between 26 to 39 years, as 40.7% over 39years while those below 25years were 8.7%. Pertaining to professional qualification, they were mostly degree and diploma holders. The respondents were evenly distributed

across the categories as 40.7% had taught for over 15 years,37% taught for between 6 and 15years. Majority of the respondents were either heads of department/subject or assistant teachers.



## 9.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

### 9.1 Discussion of Findings

The study sought to answer the following major research question;

What are mathematics and science teachers' perceptions and expectations of SMASSE INSET? This led to the following subsidiary questions; What are the perceptions and expectations of mathematics and science teachers towards the goals of SMASSE?, What do mathematics and science teachers perceive and expect of the organization and location of the training?, What do mathematics and science perceive and expect of the consideration of their welfare during SMASSE INSET?, and What do mathematics and science teachers perceive and expect of attributes to consider in selecting SMASSE trainers.

### 9.2 Teachers' Perception and Expectation of SMASSE Goals

From the findings of the study teachers' perceptions and expectations were almost the same. This implies that the training was to a large extent met teacher's expectation of what goals of SMASSE should constitute. It further indicated that teachers recognize the need for in-service training. They are also in tandem with the general concerns about the subject. This reaffirms the results of research study by Omoro (2001) revealed that teachers' desire to participate in all staff development programmes is more than the actual participation. The objectives were found to be ideal and achievable if concerns raised about the class size, teachers' workload and availability of equipments are addressed. This was necessary because a teacher is required to train in

one subject only despite the fact that one teaches at least two subjects. Suggestions made include;

- ⇒ Training simultaneously in both subjects.
  - ⇒ Organize workshops/seminars in the subjects in which they haven't been trained
  - ⇒ Organize similar but shorter training in the subject after the fourth circle
  - ⇒ Issue handouts in the second subject
- This arose from the fact that SMASSE in-service training allows a teacher to train in one subject only and yet the Teachers' Service Commission (T.S.C.) requires them to teach two. This in a way may undermine the objectives of the training since while at school the teachers will be required to also teach the second subject in which they have not undergone training.

The questionnaire also asked teachers to state factors which may enable or hamper the achievement of SMASSE goals. On one hand those which may enable the achievement of the goals were listed as follows;

- ⇒ Performance in Mathematics and Science seem to be improving since the inception of the programme.
- ⇒ Mathematics and Science teachers in the COUNTY have come together and organized common examinations in the subjects. This in a way has standardized the assessment and evaluation procedures in the COUNTY. It has also led to uniform syllabus coverage in all schools in the COUNTY.
- ⇒ Some also felt that with the inception of Constituency Development Funds (C.D.F) construction and improvement of laboratories can be achieved.



On the other hand it was noted the achievability of the goals could be hampered by the following factors;

- ⇒ The workload for a teacher is heavy and therefore they lack the time to improvise and develop teaching aids.
- ⇒ It is impossible to improvise some material and equipment for practical lessons in schools where they are lacking hence making the programme irrelevant.
- ⇒ The syllabus is too wide to allow adequate learner-centered approach to teaching to be practiced. This is because such approaches are time consuming.
- ⇒ Over enrollment in some schools hamper the implementation of learner centered approach as it may be impossible to engage them in the stipulated time of 40 minutes per lesson.
- ⇒ Inadequate libraries and books make research and eventual input by the learner into the lesson minimal.
- ⇒ Failure to incorporate SMASSE in the basic teacher training course may hamper its implementation and make the course more costly. This arises from the fact that SMASSE is not taught at teacher training institutions.
- ⇒ Decisions pertaining to the training are made at the top by officers who may not be in touch with the realities on the ground. This puts the ownership of the programme by the trainees in jeopardy, hence negative attitude.
- ⇒ Some trainers are not competent and mistreat the trainees who are their colleagues and worse some are their seniors in school.

### 9.3 Organization and Location of the training.

It was revealed that training materials are adequately supplied and management of time during the training is good.

However, the trainees suggested that the location be decentralized up to the zones to serve two purposes;

- Enable the acquisition of science materials to many schools in the COUNTY and
- Enable easy accessibility by the trainees so that there could not be the need for boarding.

It was also suggested that the timing of the training should have been in August instead of April in Trans Nzoia because April is the planting season in the COUNTY. On designing an in-service for teachers Frazer Abder (2003:80), observes that the organizers of an in-service programme should realize that teachers have lives outside the classroom. On the same, MacDiarmid (1995:2) in Hirsh (1997) states,

The changes teachers must make to meet the goals of reform entails much more than learning new techniques. They go to the core of what it means to teach. Because these changes are so momentous, most teachers will require considerable time to achieve them.

The organization of the training should include all stakeholders. As it is now, the Provincial Director of Education (P.D.E) office is excluded from the programme and yet it is the main staffer of secondary schools in the province. The basic secondary teacher training institutions like universities are excluded in the programme, yet they are the initial molders of teachers. It was noted that the training should include all the categories of teachers i.e. those still in college, out of college but not practicing and those practicing. However, the training only considers practicing teachers implying that those fresh graduates who are not practicing are not considered. This may hamper the achievement of the objectives of the training and it may be more



costly if a fresh training shall be done to cater for them.

Teachers' views on the duration, timing and number of cycles of the training were not considered. This in a way contravenes The International Conference of Education Recommendation Number 66 (UNESCO - IBE 1975) which states:

Continuous education should be an integral part of the teachers' education process and should therefore be arranged on a regular basis for all categories of the education personnel. Procedures should be as flexible as possible and adaptable to and in line with the teachers' individual needs and to the special features of each region.

This has led to technical appearance, absenteeism and boycott of the training as those concerned have other pressing commitments which include, distance learning programmes, for Trans-Nzoia, April is a planting season and most of the teachers practice farming and holiday tuition programmes.

The long process of bureaucracy has made it abit cumbersome for some schools to borrow materials/equipment from the INSET centre to use in their schools. Some schools are far from the centre especially those in Turkana COUNTY that depend on St. Brigids Girls in NAROK and Nasokol Girls in West Pokot COUNTY.

In planning a professional development programme, senior managers and subject matter specialists in each professional discipline should guide and shape the scope and content of professional development for that discipline. Information concerning professional development processes is availed to all employees to help them identify options and develop plans to realize their professional development goals. It is also imperative for employees to anticipate what is required to develop

in their current development paths or to bridge to different areas. This helps them to understand the knowledge, skills, abilities and experiences required to advance within or between disciplines.

The purpose of professional development is to enhance current performance and enable individuals to take advantage of future opportunities. This will hence enable an individual to contribute to improved performance.

To achieve success in professional development, an individual, management and the organization have varied but complimentary responsibilities. Individuals should asses their aptitudes, strength, and developmental needs with their supervisors and determine what their career to be. They should also work with their supervisors to develop and Individual Development Plan (IDP) that supports both current job and long-term professional goals and schedule appropriate on the job training, required complimentary format training and development activities.

The management should support the development and training of their subordinates and determine the job-related knowledge, skills, abilities and experiences employees need to effectively accomplish the work of the organization. It should also counsel, coach and guide employees in their professional development planning and help the employee define the short and long-term development and training needs.

Failure to include all stakeholders (teacher educators, teachers, prospective teachers, employers and government representatives) may lead to failure of an in-service programme. Ross (1990) for example, noted that members of the teaching profession were eliminated from discussions of the



gradual adjustment of professional education courses to accommodate the changing needs of practicing teachers in Great Britain. As a result the accumulated experience of these professionals was not considered in the planning process. Ross (1990) warns of the dangers that can arise when centralized decisions are imposed on all teachers. In contrast, he suggests that involvement helps teachers to understand the rationale behind a program which in turn motivates them to support it and increase the feeling of ownership.

Commenting on in-service programmes in Canada, Frazer Abder (2003) says;

The challenges of helping teachers accept and embrace educational change remains an ongoing concern..... Must go beyond short-term "quick-fix" approaches and those teachers must have some ownership over the change process.

He further gives the experience of Philippines' in-service programme where he notes;

Professional and Curriculum design are relegated to external agents instead of local practitioners. This is problematic in two regards. First, it does not recognize the knowledge Filipino educators themselves bring to science education and second it risks decontextualizing science teaching and learning.

In her comments, the need for considering the input of teachers who are agents of change and implementers of an innovation is emphasized. Frazer-Abder (2003) goes further to state that the history of science teachers' professional development in the Philippines resembles teacher training worldwide, wherein teachers are assumed to be consumers of knowledge. The history and experience of teachers are not considered as relevant to their practice.

Unfortunately SMASSE in – service seem to have taken this path.

#### 9.4 Trainees' Welfare

On, incentives to the trainees, the questionnaire asked teachers to list down incentives which in their opinion could motivate them toward the training. Majority of the respondents felt that incentives given, if any, were inadequate. Those listed include;

- Adequate allowances such as;
  - Commuter allowances for commuters
  - Night-out allowances
  - Sitting allowance and out-off pocket
- Adequate accommodation facilities preferably in hotels and be made optional.
- Assurance for promotion after the training.
- Provision of enough practical equipments and materials so that the trainees can put into practice what they have learnt.
- Transparency and accountability on the part of organization that is, the COUNTY Planning Committee (D.P.C).
- Good interpersonal relations especially by the trainers.
- Fairness in the selection of trainers so that those selected should be more qualified than the trainees.

The accommodation offered is not ideal because of lack of privacy. The trainees are used to the privacy of their houses but during the training they are made to share a room in student dormitories in disregard of the responsibility one holds and the age. This in a way, discourages many from boarding and hence the training.



Entertainment and recreational facilities for the trainees given are inadequate. It is left to the schools acting as centers to provide these facilities most of which are meant for students and not the older people. This therefore denies teachers an opportunity to refresh after the training.

As regards allowances for the trainees, in NAROK COUNTY, they are given an inadequate and a uniform amount of money as bus fare irrespective of the distance traveled. This is quite inadequate considering allowances given to other government employees embarking on similar training. This has in a way demotivates the trainees.

### 9.5 Attributes to consider in selecting trainers.

Lastly, respondents suggested the following as attributes to be considered in selecting trainers.

- Mastery of the subject matter
- Those performing excellently in their subject especially under difficult teaching/learning conditions
- Be of good communication skills and public relations
- Should be highly qualified, competent, committed and experienced
- Should be responsible and of good moral integrity
- Be a researcher, resourceful and creative

There were high incidences of uncertainty pertaining to perception which may due to the lack of knowledge on personal information concerning trainers. However the expectation was that such attributes were mainly experience, qualifications, responsibility and interpersonal skills.

### 10.0 CONCLUSIONS

From the study the following conclusions were arrived at;

Mathematics and Science teachers feel there is need for SMASSE training.

- If sustained and concerns raised addressed, the programme can solve the problem of poor performance in Mathematics and Sciences.
- Teachers' expectations of the training are not met especially on matters surrounding their welfare, selection of trainers and location of the training.
  - Not all stakeholders were involved in the preparation and organization of the training and this could hamper achievement of the goals of the programme.
- Regional and social disparities were not considered in the organization of the training.

### 11.0 RECOMMENDATIONS.

- In order to achieve SMASSE goal, the Ministry of Education should regulate enrolment in schools so as to avoid incidences of over/under enrolment, revise the workload per teacher and curriculum to be covered downwards, employ more teachers of mathematics and science to enhance efficiency and effectiveness and set up funds to construct and improve laboratories and libraries in all secondary schools.
- In order to organize effective in-service training programmes there is need to include SMASSE in the basic teacher training programmes so as to avoid duplication of training, future programmes should be started at institutions of research such as universities so as to have a thorough evaluation before implementation and the Ministry of Education should decentralize the INSET centers down to the zonal level to enable easy accessibility and to allow room for day scholars. This will in a way reduce the cost of training as well as avoid inconveniencing the trainees.
- In order to motivate teachers the M O E to give allowances to teachers which are consumerate to



other government officers of the same level, SMASSE training should form a basis of promotion of teachers to a higher level and the government should compel DPCs to be transparent and accountable to the trainees since they are handling public funds.

- The DPCs should be compelled to uphold fairness and stick to the criteria when selecting trainees.

### 12.0 Recommendations for further research.

- A similar study with a larger sample should be carried out so that a generalization can be made about mathematics and science teachers' perception and expectation of SMASSE INSET
- There's need to carry out a study on the impact of SMASSE INSET on performance of mathematics and science at K.C.S.E level
- It is necessary to conduct a research to establish factors that hinder implementation of SMASSE at school level

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