

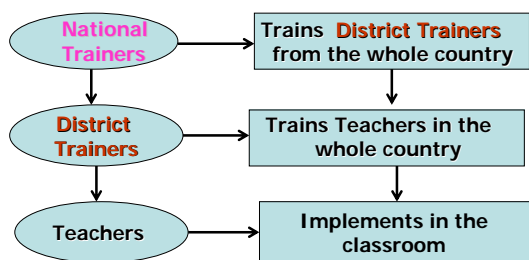
## SMASSE Project Kenya

### What is **SMASSE** Project?

- ✳ An **A**cronym for **S**trengthening of **M**athematics and **S**cience in **S**econdary **E**ducation
- ✳ Kenya education System
- ✳ 8-4-4 System of Education
- ✳ 8 years in Elementary
- ✳ **4 years in Secondary (SMASSE FOCUS)**
- ✳ 4 years in University

- ✳ Joined venture between the Kenya government through MoEST, and Government of Japan through JICA initially on pilot basis
- ✳ Mainly involved in In-Service Training (INSET) of Serving Teachers in Mathematics and Science in Secondary Schools in Kenya
- ✳ System of operation is the Cascade System of INSET

### Cascade System of Training



### Why **SMASSE**?

- ✳ Consistently poor performance in Mathematics and Science
- ✳ Ministry of Education Science and Technology (MoEST) and other stakeholders intervened
- ✳ **Baseline Survey**
  - ✳ Attitude
  - ✳ Pedagogy /Teaching Methodology
  - ✳ Mastery of Content
  - ✳ Developing teaching / learning materials
  - ✳ Administration and Management
- ✳ **SMASSE** aims to strengthen teacher competence by addressing these areas of concern

### SMASSE Intervention

#### ASEI movement through PDSI approach

The **SMASSE** Team came up with;

#### **ASEI** movement

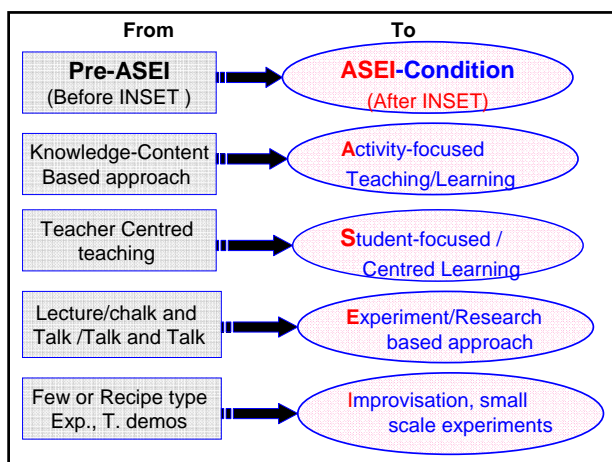
**Activity**  
**Student**  
**Experiment**  
**Improvisation**

THE AIM;

A shift from  
Ineffective classroom practices  
to  
Effective classroom practices

#### ASEI /PDSI Pedagogic Paradigm Shift

- Is simply a shift from  
The **Ineffective practices** during Pre-ASEI condition (before INSET)  
to  
The **Effective practices** of ASEI condition (After INSET)
- Based on four basic principles



### During INSET teachers are:

- Exposed to carefully selected activities that enhance interest, understanding and retention
- (Knowledge (Minds-on), Skills (Hands-on) and Attitude (Hearts-on) )**
- Given opportunity to work together and come up with more activities
  - Demonstrate how to effectively use the same (through peer teaching at 1<sup>st</sup> )
  - Actualize in the school

### To Attain 'ASEI' condition; 'Plan, Do, See, Improve (PDSI)' Approach (A must)

**Plan** activities based on ASEI principles

**Do** the planned activity

**See** or evaluate the process if objectives were achieved as planned

**Improve** on the whole process based on outcome of evaluation

### Plan

Teachers to appreciate usefulness of carefully planning of

- Teaching / Learning activities
- materials
- examples before the lesson (Apart from schemes of work)

Emphasis is on how instructional activities will enable learners to:

- Get the rationale/value for the lesson
- Understand individual concepts and connections among them
- Retain the learning and apply it in real life situations
- Get rid of learning difficulties and misconceptions
- Have more interest in the lessons

### Do ( Implement / Execute the Planned Activity)

Teachers are encouraged to;

- Present lessons in varied interesting ways to arouse learners' interest e.g. through role play, story telling
- Ensure active learner participation
- Be a facilitator the teaching/learning
- deal with students' questions and misconceptions
- Reinforce learning at each step

Teachers carry out peer teaching on the ASEI lessons and later actualize in schools (during INSET)

### See (Evaluate) ( Lesson study)

Retraining on lesson evaluation

- ☐ Continuous as the lesson progresses and
- ☐ After the lesson

By ;

- ❖ Observing students perform,
- ❖ Getting feedback and evaluating teaching process against the work plan.

Teachers are encouraged to involve the following during lesson evaluation;

- students
- fellow teachers
- administrators (DEO s, Principals)
- Quality Assurance and standards officers

Result ; Teachers are more open to evaluation

### Improve

- Lessons are improved based on the evaluation by all parties involved
- Enables teachers to;
  - ❖ see the good practices in the lesson and strengthen them
  - ❖ see weaknesses in earlier lesson and correct them
  - ❖ Avoid earlier mistakes in future lessons

### Lesson Study (summary)

- Teachers plan together based on areas of need
- Teach in a school and observe
- Identify the weaknesses and the strengths of the lesson
- Improve on the lesson
- Re-teach the lesson

### 2. Climbing Learning Method

- Was developed by Professor Noboru Saito of Naruto University of Education, Japan, Mathematics department
- It is based on the information creation learning model
- It utilizes a learning structural chart, referred to as **concept map**, **a research card** and **a table for reason of arrow lines** during lesson instruction
- In a Concept map, Concepts are arranged hierarchically with the basic concepts at the bottom going up to the top accordingly
- Stresses; Knowledge must be organized structurally and functionally

### In the *concept map*

students should fill in;

- the explanation of the learning elements,
- the formula,
- the examples
- self made problems and answers

### 3. Open-ended approach

### Why are they good practices?

#### Net Impact on teachers and learners;

- Through these approaches positive impact on skills, knowledge and attitudes
- significant improvement in performance where SMASSE has been in operation during the project period

The graph below shows some of those results in Kenya;

### A DEMONSTRATION

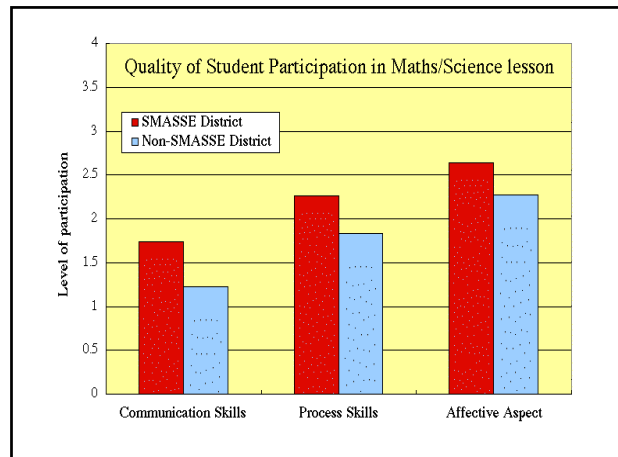
**Deducing the identities on the sum and the difference of squares**

### Misconception taken care of;

- Students in Kenya always have this misconception

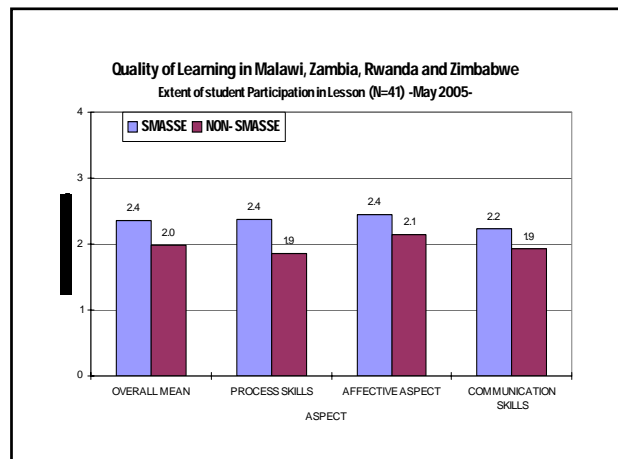
$$(a+b)^2 = a^2 + b^2$$

$$a^2 - b^2 = (a - b)(a + b)$$



**SMASSE** focuses on the African region through SMASSE-Western, Eastern, Central and Southern Africa (**WECSA**)

- Purpose; strengthening the quality of teaching and learning of mathematics and science in member countries
- adopted and adapted SMASSE's approaches as a way of improving classroom practice
- Impact of these approaches, in the classroom in Malawi, Zambia, Rwanda and Zimbabwe were as follows;



### SMASSE Project Impact Assessment Survey Results

- Nationwide survey
- Observations on the teachers and the learners after being exposed to the INSET

#### Net impact on Teachers;

- Plan better and more consistently
- Attend students' needs more
- Teachers are more open to team work
- More confident
- Try out new methods
- Face the challenge arising from lack of resources better
- Face the challenge of large classes better

### Net impact on Students

- Are actively involved
- Show great interest and responsiveness
- Attend lessons more punctually and regularly
- Do their assignments more neatly and promptly
- Carry discussions beyond class time
- Relationship with the teacher improves
- Students' interest and curiosity aroused relate mathematics to their real life experiences
- teamwork among students
- develop key competencies such as problem-solving, analysis, synthesis and application
- Their attitude gradually becomes positive
- Results gradually improves

All these are in line with the education goals

### Reforms expected;

- ▀ Positive impacts already mentioned as noted in the teachers and learners
- ▀ More include;
- ▀ positive Attitude for teachers and students
- ▀ Teachers will practice more effective Teaching Methodologies
- ▀ Teachers will have a better Mastery of Content
- ▀ Teachers will Develop effective teaching / learning materials
- ▀ There will be better Administration and Management in schools

### In summary

- ✳ These approaches are not a re-invention of the wheel
- ✳ A rallying point for the teachers to consciously focus on the student as the main player in the teaching /learning process
- ✳ A well planned lesson is the 1<sup>st</sup> step towards effectiveness in the classroom
- ✳ Evaluation provides basis for improved future performance
- ✳ Therefore **systematic work planning** and **evaluation** are very key

### In essence;

**Students should become more active in the learning process**

**while**

**Teacher carefully guides the process with more meaningful learning activities**