

Course Code: RC-SM-136-3

**Course Title:
MEANINGFUL LEARNING IN SECONDARY MATHEMATICS THROUGH
INTERACTIVE TECHNOLOGIES**

Rationale:

Students often have difficulty learning mathematics because mathematics concepts are generally abstract. Such concepts are difficult to understand as they do not make sense or meaning to the students. Meaningful learning is the learning from which the learners make personal meaning and have the ability to use what was learned to solve new problems, answer new questions, or facilitate the learning of new subject matter. Meaningful learning can be facilitated using interactive technologies. Interactive technologies are media that can provide a meaningful setting that allow for an engaging and meaningful experience for the students. Interactive technologies help them make sense of the mathematics they study by enhancing their ability to visualise and increasing their opportunity to develop modeling skills. In this course, interactive technologies such as electronic calculators, interactive whiteboard, and dynamic mathematics software will be utilised in promoting and enhancing meaningful learning in mathematics.

Objectives:

The main objective of the course is to develop participants' knowledge and skills in using the various interactive technologies available to enhance students' meaningful learning in Secondary Mathematics.

At the end of the course, participants are able to:

1. develop an understanding on how the use of interactive technologies in mathematics classrooms can promote meaningful learning in mathematics;
2. develop assessment materials and instruments to gauge students' understanding of mathematical concepts;
3. design and create mathematics lessons and other instructional materials to develop mathematical skills and promote meaningful learning in mathematics through interactive technologies and
4. use the lesson quality improvement process to develop quality lesson plans that illustrate meaningful learning in mathematics using interactive technologies.

Course Contents:

This course emphasises a good grounding of theory, classroom practice and lesson quality improvement process. Emphasis will be given to discussions and activities to demonstrate the strategies involved in the teaching and learning of mathematics using interactive technologies to promote meaningful learning in secondary mathematics.

The major areas include:

1. Major issues and trends in meaningful learning in mathematics
 - 1.1 The nature and philosophy of mathematics
 - 1.2 Concept development and misconception in mathematics
 - 1.3 Learning difficulties in mathematics
 - 1.4 Engaged and learner-centred learning
 - 1.5 Interactive technologies in mathematics
2. Affordances of interactive technologies
 - 2.1 Interactivity
 - 2.2 Visualisation
 - 2.3 Conjecturing
 - 2.4 Modeling
 - 2.5 Generalisation
3. Using some interactive technologies in promoting and enhancing meaningful learning in mathematics
 - 3.1 Electronic calculators
 - 3.2 Interactive whiteboard
 - 3.3 Dynamic mathematics software
4. Developing assessment for meaningful learning in mathematics materials.
5. Planning, designing, developing and trying out quality sample lesson plans/activities/materials with emphasis on the principles of instructional design to develop and promote meaningful learning in mathematics through interactive technologies.

Duration: Four weeks

Participants: Mathematics educators or key primary mathematics teachers

Expected Output: Project work report (Group report)
Multiplier effect action plan (Individual action plan)