

Course Code: RC-SS-135-3

Course Title:

LEARNING BY DOING: ICT TOOLS FOR SECONDARY SCIENCE CLASSROOMS

Rationale:

Science educators have always been concerned with helping student learn science by doing science. The progression from hands-on activities to minds-on activities in a learning event is seen as an important way of learning science. However this form of learning science places a great deal of constraint on the typical science classroom. For instance, it is known that students tend to spend so much of their time with the hands-on activity that they do not have enough time left for minds on work for meaningful learning to occur. In recent years a number of highly interactive tools have been developed specifically for science learning. There is thus a need to explore how these modern power tools could be used effectively to promote learning in the secondary science classroom.

Objectives:

The main objective of the course is to develop participants' knowledge and skills in incorporating highly interactive ICT tools specifically developed for the teaching and learning of science to support student learning of science by doing science as hands-on and minds-on activity.

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

1. Identify and demonstrate the use of the major power tools available for teaching and learning of science
2. Create hands-on and minds-on science lessons that incorporates the use of power tools
3. Use the lesson quality improvement process to design, develop and evaluate hands-on and minds-on science lessons that incorporates the use of power tools

Course Contents:

This course emphasizes the effective application of theory into practice. Emphasis will be given to discussions and activities that involve the effective use of power tools in teaching and learning of science.

The major areas include:

1. Hands-on and minds-on learning;
  - 1.1. Issues in science learning
  - 1.2. Approaches that support hands-on and minds-on learning
  - 1.3. Designing a hands-on, minds-on lesson
2. Power Tools
  - 2.1. Data Logging Systems
  - 2.2. Simulations

- 2.3. Virtual Laboratory Simulations
- 3. Integration of Power Tools in hands-on, minds-on science lessons
  - 3.1. Integration issues
  - 3.2. Teaching and learning approaches that support the use of power tools
  - 3.3. Designing a hands-on, minds-on lesson incorporating the use of power tools
  - 3.4. Assessing learning
- 4. Lesson quality improvement process
  - 4.1. The lesson quality improvement process
  - 4.2. Develop quality lesson plans that illustrate the integration of power tools in a hands-on, minds-on science lesson using the lesson quality improvement process

Duration: Four weeks

Participants: Science educators or key secondary science teachers

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