



**Action Research:
Enhancing Teaching and Learning in Science and Mathematics
through Resolving Classroom Problems**

Malaysia In-Country Course
15 - 19 February 2016

1. Rationale

Effective teachers spend a great deal of time reflecting on their teaching. In most cases the teachers' decision to plan and implement the lessons are influenced by their reflections based on the results from previous classes taught. To harness teachers' reflective skills more systematically, it involves a series of steps described in an action research. Action research is a form of self-reflective inquiry widely used in school-based curriculum, professional development and school improvement. It is considered by educators at present as an alternative and innovative approach to a more traditional theory-based approach in educational research. Thus, participatory action research is a powerful innovation to bridge existing gaps between theory and practice in teaching science, mathematics and other learning areas across the curriculum. Through action research, teachers/educators are encouraged to develop their own innovative approaches to enhance classroom teaching and learning process across school curricular areas.

2. Course Objectives

The main purpose of this course is to provide participants the necessary information that may transform into innovative knowledge and skills to enable them to design, conduct and write a report on action research in their own classrooms. At the end of the course, the participants should be able to:

- Acquire basic knowledge and application on the nature and philosophy of action research;
- Raise awareness on the effectiveness and implication of action research in teaching and learning of science, mathematics, and other areas across the school curriculum;
- Demonstrate reflective skills in their teaching practices;
- Describe alternative methods/strategies used in conducting action research;
- Develop skills necessary to improve the teaching and learning of science, mathematics and other learning areas through action research; and
- Design classroom action research projects.

3. Course Contents

The course will primarily involve discussions through brainstorming and workshops activities that will enable participants to acquire skills involved in initiating action research projects in school settings. The participants, in small groups, shall each design a small-scale action research project aimed to improve classroom practice. The major topics included in the course are:

A THE THEORETICAL FRAMEWORK OF ACTION RESEARCH IN SCHOOLS

a) Introduction to Research in Education

- The Research Process in the 21st Century
- Different Research Approaches: Quantitative and Qualitative

b) Historical and Philosophical Background of Action Research

- History and Nature of Action Research
- Philosophical Background of Action Research
- Methods of Action Research

c) Teachers as Researchers

- Reflective Practices of Teachers
 - Elements of Reflective Practices
 - Characteristics of Reflective Teachers

d) Getting Started with Action Research

- Focusing on Issues and Problems
- Identifying a Statement of Problem
- Making hypotheses

e) Knowing More about your Issue

- Literature Review: What, Why and How
- Resources for Literature Review
- Sourcing for Literature

f) Data Collection Methods and Instruments

- Classroom Documents and Records
- Teaching Logs and Journals
- Observation
- Interview
- Survey Questionnaire
- Test
- Other Direct/Indirect Methods

g) Analysing and Interpreting Data

- Analysing Qualitative Data
 - Identifying and Examining Patterns or Themes
 - Making Interpretations
- Quantitative Data Analyses
 - Computing Statistical Indices
 - Making Interpretations

B THEORY INTO PRACTICE: Designing Action Research Project Proposal

a) School Visit

- Structured and Unstructured Interviews
- Classroom Observation

b) Outdoor Study

- Educational Visit to UNESCO Heritage Site
- Nature Study encompassing Science/Maths Learning at Penang Hill

c) Using the Action Research Process in Designing an Action Research Project

- Identifying Research Focus
- Formulating a Statement of Problem
- Planning Action/Intervention
- Planning Data Collection and Analysis

d) Drafting Action Research Project Proposal

4. Duration: 30 Hours

5. Participants: i. Malaysian primary and secondary science/mathematics teachers who have **NOT** attended any Action Research course.
ii. Maximum 30 teachers

6. Facilitators: Mr. Lee Shok Mee and Dr. S. Kanageswari Suppiah Shanmugam

COURSE OUTLINE

Date: 15 - 19 February 2016

Facilitators: Mr. Lee Shok Mee (LSM) and Dr. S.Kanageswari Suppiah Shanmugam (SKS)

Section	Topic/Activity	Hours	Staff	Suggested Approach	Intended Outcomes/Output
1.0 The Theoretical Framework of Action Research in Schools (16 hours)					
1.1	<i>Introduction to Research in Education</i> <ul style="list-style-type: none"> • The Research Process in the 21st Century • Different Approaches to Research <ul style="list-style-type: none"> - Quantitative - Qualitative 	2	SKS	Discussion Brainstorming and Workshop Activities	<ul style="list-style-type: none"> • Define and learn the concept of educational research in the 21st century • Identify the phases of research process • Differentiate qualitative and quantitative methods
1.2	<i>Historical and Philosophical Background of Action Research</i> <ul style="list-style-type: none"> • History and Nature of Action Research • Philosophical Background of Action Research • Models of Action Research 	2	SKS	Exposition Discussion Workshop	<ul style="list-style-type: none"> • Understand the rationale of action research within the context of classroom and educational research • Identify the key concepts and characteristics of action research • Know the various models of action research
1.3	<i>Teachers as Researchers</i> <ul style="list-style-type: none"> • Reflective Practices of Teachers <ul style="list-style-type: none"> - Elements of Reflective Practices - Characteristics of Reflective Teachers 	2	LSM	Individual Reflection Group Discussion	<ul style="list-style-type: none"> • Understand the importance of the role of teacher as researcher • Relate personal reflective teaching practices • Compare the different characteristics of reflective teaching
1.4	<i>Getting Started with Action Research</i> <ul style="list-style-type: none"> • Focusing on Issues and Problems • Identifying a Statement of Problem • Making Hypotheses 	4	LSM/ SKS	Brainstorming Workshop Group Discussions	<ul style="list-style-type: none"> • Characterise and evaluate a researchable problem • Formulate research questions • Define testable hypotheses

1.5	Knowing More about your Issue <ul style="list-style-type: none"> Literature Review: What, Why and How Resources for Literature Review Sourcing for Literature 	2	LSM/ SKS	Workshop Discussion Exploring the Internet	<ul style="list-style-type: none"> Recognise the importance of literature review Identify resources, including the Internet to acquire credible literature
1.6	Data Collection Methods and Instruments <ul style="list-style-type: none"> Classroom Documents and Records Teaching Logs and Journals Observation Interview Survey Questionnaire Test Other Direct/Indirect Methods 	2	LSM/ SKS	Exposition Workshop Discussion	<ul style="list-style-type: none"> Identify various data collection methods/ techniques Acquire knowledge about the data relevant to the research Gain understanding on the issues related to validity and reliability by triangulation
1.7	Analysing and Interpreting Data <ul style="list-style-type: none"> Analysing Qualitative Data <ul style="list-style-type: none"> Identifying and Examining Patterns and Themes Making Interpretations Quantitative Data Analyses <ul style="list-style-type: none"> Computing Statistical Indices Making Interpretations 	2	LSM/ SKS	Exposition Workshop Discussion Hands-on Activities	<ul style="list-style-type: none"> Analyse qualitative and quantitative data Use of computer software to analyse quantitative data Making interpretations from statistical indices
2.0	Theory into Practice: Designing Action Research Project Proposal (14 hours)				
2.1	School Visit <ul style="list-style-type: none"> Structured and Unstructured Interviews Classroom Observation 	2	LSM/ SKS	Discussion Interview Observation	<ul style="list-style-type: none"> Gain and develop experience and skills for identifying issues for actions research through interaction with teachers, pupils and observation. Gain reflection skills on emerging and existing issues through open discussions about the

					strengths and challenges, and improvements in the classroom
2.2	Outdoor Study <ul style="list-style-type: none"> Educational Visit to UNESCO Heritage Sites Nature Study (Science/Maths trail) at Penang Hill 	2 (extra time)	LSM/ SKS	Educational tour Field study	<ul style="list-style-type: none"> Outdoor study as a pedagogical tool to enhance classroom instruction
2.3	Using the Action Research Process in Designing an Action Research Project <ul style="list-style-type: none"> Identifying Research Focus Formulating a Statement of Problem Planning Action/Intervention Planning Data Collection and Analysis 	4	LSM/ SKS	Discussion Hands-on Activities	<ul style="list-style-type: none"> Prepare action research proposal to resolve an identified classroom problem
2.4	Drafting Action Research Project Proposal	6	LSM/ SKS	Workshop Presentation	<ul style="list-style-type: none"> Acquire skills in writing an action research project proposal

DISTRIBUTION OF HOURS

No.	Topics/Activities	Hours	Percentages (%)
1.	Action Research: Theoretical Inputs	16	53
2.	Theory into Practice: Designing Action Research Project Proposal	14	47
	TOTAL	30	100



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COURSE SCHEDULE (Tentative)

15 - 19 February 2016

Facilitators: Mr. Lee Shok Mee (LSM) and Dr. S.Kanageswari Suppiah Shanmugam (SKS)

VAR=various

Day/Time	Day 1: 15 February 2016 [Monday]	Day 2: 16 February 2016 [Tuesday]	Day 3: 17 February 2016 [Wednesday]	Day 4: 18 February 2016 [Thursday]	Time	Day 5: 19 February 2016 [Friday]
08:30 10:30	08:00-08:30 Registration	(Day 1) Recap & Feedback	(Day 2) Recap & Feedback	(Day 3) Recap & Feedback		(Day 4) Recap & Feedback
	08:30 – 09:00 Opening /Briefing: VAR/LSM/SKS 09:00-10:30 Introduction to Research in Education SKS	Identifying Issues and Problems in Your Classroom LSM	Getting Started with Action Research 2 SKS	Analysing and Interpreting Data SKS	08:00 10:00	Drafting Action Research Project Proposal 1 LSM/SKS
10.30 -11.00	Tea Break				10:00-10:30	Tea Break
11:00 13:00	Historical and Philosophical Background of Action Research SKS	Data Collection Methods and Instruments LSM/SKS	School Visit LSM/SKS	Designing an Action Research Project 1 LSM/SKS	10:30 12:15	Drafting Action Research Project Proposal 2 LSM/SKS
12.30-14.30	Lunch				12:15-14:45	Lunch
14:30 16:30	Teachers as Researchers LSM	Getting Started with Action Research 1 LSM	Outdoor Study LSM/SKS	Designing an Action Research Project 2 LSM/SKS	14:45 16:45	Drafting Action Research Project Proposal 2 Course Evaluation LSM/SKS
						16:15 – 16:45 Closing LSM/SKS/VAR
24-hour <i>Wi Fi</i> available in the campus						Till we meet again!

