



**ISTIC**  
INTERNATIONAL SCIENCE, TECHNOLOGY AND  
INNOVATION CENTRES FOR SOUTH-SOUTH  
COOPERATION UNDER THE AUSPICES OF UNESCO



KEKANTONAN TENAGA, SAINS, TEKNOLOGI,  
ALAM SEHAT DAN PERTIWIHAN BELIA



# **TRAINING WORKSHOP ON DEVELOPING THINKING SKILLS THROUGH INQUIRY-BASED SCIENCE EDUCATION (IBSE)**

**22-26 OCTOBER 2018**

**KUALA LUMPUR, MALAYSIA**



# TRAINING WORKSHOP ON DEVELOPING THINKING SKILLS THROUGH IBSE

## BACKGROUND

Many developing countries are faced with basic issues in science education such as the shortage of qualified science teachers, lack of facilities including laboratories and equipment and poor methods of delivery in the teaching of this subject. Teaching tends to be teacher centred and prescriptive thus leaving little opportunity for children for investigation and discovery leading to disinterest in the subject. Science requires a teaching approach in which pupils should be actively engaged in carrying out inquiry and discovery and the use of evidence to formulate hypotheses and theories. Learning by doing is based on personal investigation that helps pupils to develop cognitive processes as well as the sense of curiosity and creativity. Inquiry based activities allow pupils acquire new communication skills, through discussions in the classroom and with the teacher. Instead of the usual memorisation and concentration of scientific concepts and formulas, IBSE insists on the appropriation of knowledge through individual investigation and questioning attitude leading the pupils to learn by experimenting in partnership with the teacher. Hence the use of the hands and the brain lends itself as an appropriate teaching and learning strategy for science.

Inquiry based science education (IBSE) has been recognised as an effective method of teaching science. The inquiry based learning approach based on the French "*La main a la pate*" (literally translated as "hands in the dough") developed by the French Academy of Sciences in 1996 led by Nobel Laureate George Charpak, Prof. Pierre Lena and Prof. Yves Quere originated out of concern for the lack of interest in science subjects and the need to find an innovative way of renewing the teaching of science. The approach, now disseminated in more than fifty countries, both developed and developing, emphasises raising pupils' curiosity, creativity and reasoning by including them in the investigative and discovery process through experimentation. The approach also strengthens pupils' language skill through the use of science note books.

## RATIONALE

IBSE is an innovative teaching pedagogy that calls for the active participation of pupils in the learning process through maximising children's' natural curiosity, identification of problems, possible explanations or solutions, hypothesis to be tested, design of protocols to be tested involving several choices, the actual investigation, confirmation of the assumption, structure of knowledge in response to the questions raised and comparison with established facts. All the steps are in line with pedagogy recommended in the current Malaysian primary school science syllabus.

By using IBSE in teaching, it is hoped that learning science for pupils will be appealing and meaningful. This can contribute to increased interest in learning the subject and minimise the current issues facing school science education today. Hence the ultimate beneficiary will be pupils.

The training programme examines the basic principles of inquiry-based science approach to science and technology education in an effort to re-emphasise and revive the importance of learning. The expectation is that participants implement the approach in their own practice and disseminate what they have learned to colleagues and other science educators in their own institutions and national settings.

## OBJECTIVE

- a. To re emphasise the basic principles of inquiry-based science education
- b. To provide opportunities for science teachers to try out IBSE in the teaching of science in their classes;
- c. To experience the process of inquiry-based science teaching and learning; and
- d. To provide strategies on developing thinking skills.

## **PARTICIPANTS**

Participants will comprise between 35 – 40 science educators from developing countries who need to upgrade their skills in IBSE or who have not yet attended workshops on IBSE.

### **International Participants:**

The organiser will bear the local cost (accommodation, food and meeting package) to qualified participants who are selected to attend this training workshop.

Participants are required to seek travel grant from their organisations to pay for their travel expenses to Kuala Lumpur, Malaysia.

### **Malaysian Participants:**

The organiser will bear the local cost (food and meeting package) to qualified participants who are selected to attend this training workshop.

Malaysian participants will have to bear their own travel and accommodation expenses. Limited sponsorship on accommodation is available for Malaysian participants based on merit and need on case by case consideration.

## **WORKSHOP DURATION AND VENUE**

The training workshop will be held in Kuala Lumpur, Malaysia from 22-26 October 2018.

## **APPLICATIONS**

For **International** Participants:

Applicants from the NAM member countries except those from Malaysia should submit their applications using the prescribed form (**enclosed**) directly to the NAM S&T Centre through Email: [namstcentre@gmail.com](mailto:namstcentre@gmail.com) latest by **Monday, 8<sup>th</sup> October 2018**.

The selection will be made strictly on the basis of the academic background and professional experience of the applicants and the interest of their parent organisations in the subject area, as will be seen from the documents to be submitted by them. For this purpose, a 3-4 page write-up (**in MSWord**) should be enclosed with the Nomination Form on what qualifies the applicant for participation in this workshop and how the applicant and his/her institution and country will benefit from the Training. This write-up may eventually be published in the form of a chapter of a book after appropriate modifications after the completion of the Training Workshop that the NAM S&T Centre may publish in follow up of this event.

For **Malaysian** Participants:

Link: <https://goo.gl/forms/PFmXCDXTkDhEhHQf1>

### **Medium of Instruction**

The training programme will be conducted in English.

## **FINANCIAL ARRANGEMENTS FOR INTERNATIONAL TRAVEL**

This will be conveyed separately to individual applicants by the NAM S&T Centre.

## **SECRETARIAT & ENQUIRIES**

International Science, Technology and  
Innovation Centre for South-South  
Cooperation under the auspices of  
UNESCO (ISTIC),  
902-4, Jalan Tun Ismail  
50480 Kuala Lumpur, Malaysia

Tel: +603-2694 9898 ext. 112

Fax: +603-2698 4549

Email: [adzim@istic-unesco.org](mailto:adzim@istic-unesco.org)

Website: <http://www.istic-unesco.org>

Centre for Science & Technology of the  
Non Aligned and Other Developing  
Countries (NAM S&T Centre),  
Core – 6A, 2<sup>nd</sup> Floor, India Habitat Centre,  
Lodi Road,  
New Delhi – 110003, India

Tel: +91-11-24645134; 24644974

Fax: +91-11-24644973

Email: [namstcentre@gmail.com](mailto:namstcentre@gmail.com);  
[namstct@gmail.com](mailto:namstct@gmail.com)

Website: [www.namstct.org](http://www.namstct.org)

## WORKSHOP PROGRAMME

Day 1	22 OCTOBER 2018 (Monday)
8.30 am – 9.00 am	Registration
9.00 am – 9.45 am	Opening
9.45 am – 10.00 am	Group Photo
10.00 am – 10.30 am	Tea break
10.30 am – 11.00 pm	Science Education and Sustainable Development Goals
11.00 am – 1.00 pm	Hands-on activity 1: Classification of Living Species
1.00 pm – 2.15 pm	Lunch
2.15 pm – 4.00 pm	Hands-on activity 2: According to the La main a la pate approach and analysis of the activity – measuring time
4.00 pm – 4.30 pm	My Science Journal
4.30 pm – 5.00 pm	Reflection on day's programme
5.00 pm	Tea / Adjournal

Day 2	23 October 2018 (Tuesday)
8.30 am – 10.30 am	Hands-on activity 3: Raising questions: Kinds of questions learners raise when exploring a phenomena in their environment
10.30 am – 11.00 am	Tea break
11.00 am – 12.00 pm	Changing non-investigable question into investigable question & Types of Questioning
12.00 pm – 1.00 pm	Applying IBSE into Practice in Class
1.00 pm – 2.15 pm	Lunch
2.15 pm – 3.30 pm	Hands-on activity 4: Inter - disciplinary project. Theme: Water
3.30 pm – 4.30 pm	Hands on Activity 5: Earth Science and natural Disaster 1
4.30 pm – 5.00 pm	Reflection
5.00 pm	Tea / Adjournal

<b>Day 3</b>	<b>24 October 2018 (Wednesday)</b>
8.30 am – 10.30 am	Hands-on activity 6: Climate Change Education
10.30 am – 11.00 am	Tea break
11.00 am – 12.30 pm	Analysis of practice through video
12.30 pm – 1.00 pm	Resources for Teachers
1.00 pm – 2.15 pm	Lunch
2.15 pm - 4.00 pm	Hands-on Activity 7: Earth Science and Natural Disaster 2
4.30 pm – 5.00 pm	Preparation for Micro Teaching
5.00 pm	Tea / Adjourn

<b>Day 4</b>	<b>25 October 2018 (Thursday)</b>
7.45 am – 11.30 am	Field Visit
11.30 am – 1.00 pm	Preparation for Micro – Teaching
1.00 pm – 2.15 pm	Lunch
2.15 pm – 5.00 pm	Preparation for Micro – Teaching
5.00 pm	Tea / Adjourn

<b>DAY 5</b>	<b>26 October 2018 (Friday)</b>
8.30 am – 10.30 am	Micro-Teaching
10.30 am – 11.00 am	Tea Break
11.00 am – 12.30 pm	Micro-Teaching
12.30 pm – 2.30 pm	Lunch and Friday Prayers
2.30 pm - 4.00 pm	Round up and Feedback session
4.00 pm – 4.30 pm	Workshop Evaluation
4.30 pm – 5.00 pm	Closing and Certificate Presentation
5.00 pm	Tea and End of Programme



The creation of the International Science, Technology and Innovation, Centre for South-South Cooperation under the auspices of UNESCO (ISTIC) is a follow up of the Doha Plan of Action which has been adopted by the head of States and Government of the Group of 77 and China, during the meeting in Doha, Qatar, from 12-16 June 2005 on the occasion of the Second South Summit of the Group of 77. The Summit urged UNESCO to develop and implement a programme for South-South cooperation in science and technology with the objective of facilitating the integration of a developmental approach into national science and technology and innovation policies, capacity building in science and technology through providing policy advice and exchange of experience and best practices, and creating a problem solving network of centres of excellence in developing countries as well as supporting the exchange of students, researchers, scientists and technologists among developing countries. ISTIC will act as an international platform for South-South cooperation in science, technology and innovation and make use of the network of the G77 plus China and the Organization of the Islamic Conference (OIC). The overall goal of ISTIC is to increase the capacity for management of science, technology and innovation throughout developing countries. ISTIC Secretariat is hosted by the Academy of Sciences Malaysia (ASM) for five years before making ISTIC an autonomous organisation. Details on ISTIC is available at [www.istic-unesco.org](http://www.istic-unesco.org)



The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre; [www.namstct.org](http://www.namstct.org)) is an inter-governmental organisation with a membership of 47 countries spread over Asia, Africa, Middle East and Latin America. The Centre was set up in 1989 in New Delhi, India in pursuance of recommendations of various NAM Summit meetings for the promotion of South-South cooperation in science and technology. The Centre undertakes a variety of programmes, including organisation of workshops, symposiums, meetings and training courses and implementation of collaborative projects. It also offers short-term research fellowships to scientists from developing countries in association with the Centres of Excellence in various countries. The Centre also produces technical books and other scientific publications in different subjects. These activities provide opportunity for scientist-to-scientist contact and interaction; familiarising participants on the latest developments and techniques in the subject areas; identification of the requirements of training and expert assistance; locating technologies for transfer between the members and other developing countries, dissemination of S&T information etc. In addition, the Centre encourages academic-R&D-industry interaction in the developing countries through its NAM S&T-Industry Network.



**CENTRE FOR SCIENCE AND TECHNOLOGY OF THE  
NON-ALIGNED AND OTHER DEVELOPING COUNTRIES  
(NAM S&T CENTRE)**

**TRAINING WORKSHOP**

**ON**

**DEVELOPING THINKING SKILLS THROUGH  
INQUIRY-BASED SCIENCE EDUCATION (IBSE)**

**Kuala Lumpur, Malaysia, 22-26 October 2018**

**NOMINATION FORM**

*PLEASE TYPE OR USE BLOCK CAPITALS;  
NO COLUMN SHOULD BE LEFT BLANK*

**SECTION –A**

(To be filled in by the nominee)

Please affix your scanned photograph
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- 1 Name (Prof/Dr/Mr/Mrs/Ms): .....  
(As in Passport)
- 2 Father's/Spouse Name: .....
- 3 Designation (Position held): .....
- 4 Nationality: .....
- 5 Date of Birth: ..... Place of Birth (City) ..... (Country).....
- 6 Passport No: .....Place of issue: .....  
Date of Issue: ..... Valid up to: .....  
(Please attach copies of the relevant pages of your Passport)
- 7 Name of the Parent Institution (Employer): .....  
Full Address (Office): .....  
.....  
Phone: ..... Fax: .....  
E-mail: .....
- 8 Full Address (Home): .....  
.....  
Phone: ..... Mobile: .....  
Fax: ..... E-mail: .....
- 9 Educational Qualifications: Highest Degree. ....  
Year of Award: ..... University: .....  
Field of Study: .....

10 Brief Bio data (CV): .....

(Maximum two pages, in MSWord; to be attached on separate sheet)

11 What in your opinion qualifies you for participation in this workshop and how you and your country will benefit from your participation in this Training Workshop?

Please enclose a write-up of about 3-4 pages on separate sheets on this matter, which may eventually be published in the form of a chapter of a book after incorporating appropriate modifications after the completion of the Training Workshop that the NAM S&T Centre may publish in follow up of this event.

Date: ..... Signature: .....

**SECTION -B**

**ENDORSEMENT BY NOMINATING AUTHORITY**

(The Applicant in a member country of the NAM S&T Centre may get the following endorsement signed by the Focal Point of the Centre in his/her country, *if he/she wishes to take advantages accrued to the official nominee of the country*. For the list of the member countries and names/addresses of the Focal Points please visit Centre's website [www.namstct.org](http://www.namstct.org).)

Signature: .....

Name (in full): .....

Designation: .....

Date: .....

**SEAL**

**Enclosures:**

1. Scanned copies of the relevant pages of Passport
2. Brief CV (maximum two pages, in MSWord) – Ref. No. 10
3. Compilation of your thoughts in regard to the theme of the Training Workshop (about 3-4 pages, in MSWord) – Ref. No. 11