

**Regional Capacity Building Workshop on
Inquiry Based Science Education (IBSE)
at Pedagogical University of Tajikistan, Dushanbe
(25-29 September 2017)**

Concept Note

Introduction

Basic knowledge in science as well as up-to-date technical know-how and innovativeness are indispensable for countries aspiring to be part of ever-growing global competition. Sufficient understanding of scientific principles and concepts is requisite for the needs at the workplace and in daily lives in order to fully gain the many benefits that science has to offer. Thus a good foundation in science among students serves as the basis for scientific literacy, promotes better understanding of the environment and the world as well as for the preparation of future scientists and technocrats but above all, for nurturing the rational and creative global citizens. 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 which tend to be teacher-centered and prescriptive; thus leaving little opportunity for children for investigation and discovery leading to disinterest in the subject.

Concerned with these problems several countries have now embarked on efforts at the renewal of teaching science as early as at the preschool level. Science requires a teaching approach in which pupils are required to 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 to acquire new communication skills, through discussions in the classroom and with the teacher. Instead of the usual memorization and concentration of scientific concepts and formulas, the Inquiry Based Science Education (IBSE) insists on the appropriation of knowledge through individual investigation and questioning attitude leading the pupils to learn by experimenting in partnership among them and with the teacher. Hence the use of the hands and the brain, lends itself as an appropriate teaching and learning strategy for science.



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Inquiry Based Science Approach

Inquiry-based science education-IBSE is an approach to teaching and learning in general but especially the Science, Technology, Engineering and mathematics (STEM) subjects at all levels particularly the schools. IBSE approach comes from an understanding of how learners/students learn, the nature of science inquiry, and a focus on basic content to be learned. It also is based on the belief that it is important to ensure that students truly understand what they are learning, and not simply learn to repeat content and information. Rather than a superficial learning process in which motivation is based on the satisfaction of being rewarded, IBSE goes deep and motivation comes from the satisfaction of having learned and understood something. IBSE is not about quantities of information memorized in the immediate, rather it is about ideas or concepts leading to understanding that grows deeper and deeper as students get older.

It has been proved and globally recognized that IBSE initiatives throughout the world, especially the experience of LAMAP foundation in France that IBSE teaching methodology has been quite effective in improving the science and numeral literacy of school children. IBSE enables children to question and doubt every proposition, until and unless his/her proposition is supported by experiment and borne out by evidence. In other words, IBSE trains rational citizens who will base decisions on the assessment of evidence using scientific methodology.

As an initiative of ECO Science Foundation (ECOSF), IBSE programme was launched in the ECO region in June 2015 with an IBSE Capacity Building workshop for national programme leaders in Astana-Kazakhstan. The programme was launched with collaboration and cooperation of national governments/organizations and international partners; viz., *La main à la pâte* of France, the International Science, Technology and Innovation Center for South-South Cooperation under the auspices of UNESCO (ISTIC) Kuala Lumpur- Malaysia and the Inter- Academy Partnership (IAP) Science Education Programme (SEP). Subsequently, the national capacity building workshops have since been organized in Pakistan (Sept 2016), Iran (Jan 2017) and as well as holding of High Level Forum on IBSE in Pakistan (May 2017). Thus, this proposed Regional Capacity Building Workshop on IBSE in Dushanbe, Tajikistan is continuity and part of this program as one of the flagship projects of ECOSF in the region and beyond in order to strengthen the science base for advance S&T research and higher education in the ECO member countries.

The Workshop is being organized by ECOSF in collaboration with Pedagogical State University of Tajikistan, Academy Partnership – Science Education Programme (IAP-SEP), Academy of Sciences of Republic of Tajikistan, and International Science,



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Technology & Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC), the Islamic Development Bank (IDB).

Objectives of the Workshop are to:

- Get more students studying science and mathematics at the primary and secondary school levels;
- Prepare students to engage with science ideas and be knowledgeable about the way science and scientists work;
- Raise awareness of opportunities in science and technology-related careers;
- Increase the number of students choosing science and engineering careers to address the shortage of science and engineering graduates;
- Improve the quality of science classroom teaching practice;
- Link primary, secondary and tertiary (higher) education, scientific research and industry building on the strengths of each sector leading ultimately to knowledge based economic development in the ECO Region; and
- Improve science literacy and understanding in the community.

Expected Outcome

At the end of the workshop, participants should be able to:

- Recognize the philosophy and ten principles of *La main à la pâte*;
- Experience the process of inquiry-based science teaching and learning through various *La main à la pâte* lesson examples and activities;
- Gain insights into activities that not only can encourage and motivate students in science through the hands-on activities but also convince decision makers to pursue *La main à la pâte* approach for education;
- Develop a national action plan for disseminating and sharing of experiences on *La main à la pâte* with colleagues and teachers in their respective home countries;
- Define the roles of trainers and resource persons in operationalizing *La main à la pâte* in home countries;

Target Participants

Participants should be the Focal Points on IBSE for ECO Science Foundation and those Master science teacher trainers/curriculum developers/science



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supervisors/national trainers and/or decision-makers from ECO member countries, that will subsequently coordinate the implementation of IBSE in respective countries. About 25 participants (two from each country- one from science sector and the other from education), plus up to 40 participants from the host country (Tajikistan) are expected to attend the workshop.

Venue: Pedagogical State University of Tajikistan, 121, Rudaki Ave, Dushanbe, Tajikistan.

Date: 25-29 September 2017

Organizers

- ECO Science Foundation (ECOSF) [www.eco4science.org],
- The Pedagogical State University of Tajikistan
- Inter Academy Partnership – Science Education Programme (IAP-SEP)
- International Science, Technology & Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC)
- Academy of Sciences, Republic of Tajikistan

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