High Level Forum on

**Inquiry Based Science Education (IBSE)– *La main a la pate***

**Higher Education Commission- HEC, Islamabad - Pakistan**

(11 May 2017)

**Concept Note**

**Introduction**

Basic knowledge in science as well as uptodate technical know-how and innovativeness are indispensible 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 work place 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 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.

**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.

**Background**

ECOSF: As an initiative of ECO Science Foundation (ECOSF), IBSE programmes was launched in ECO region in June 2015 with an IBSE Capacity Building workshop for national programme leaders (including PSF & PAEC Pakistan) in Astana-Kazakhstan. The programme was launched with collaboration and cooperation of national governments/organizations and international partners;viz.,*La main a la pate* Foundation 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) and Iran (Jan 2017). More IBSE Capacity Building workshops are planned in the region in 2017 and beyond as one of the flagship project in order to strengthen the science base for advance S&T research and higher education in the ECO member countries.

HEC: In 2010, the then Federal Ministry of Education of Pakistan was devolved to be responsibility of Provinces, while Higher Education Commission (HEC) as national body has continued to nurture and promote higher education in Pakistan. HEC while analyzing the standards and performance of science students and graduates realized that the diminishing standard of science graduate was tracing down in what and how they are taught at school and college level! The HEC has therefore decided to strengthen science base of future graduated especially in STEM subjects and has launched a project entitled; “Hand holding of Schools” by the Universities across Pakistan.

**Aims& Objectives of the Forum and beyond**

In view of the above background, ECO Science Foundation after discussions with different stakeholders including HEC and the ECOSF’s French partners- *La main a la pate*Foundation of France and the Embassy of France, proposed to jointly organize aHigh Level Forum on IBSE hosted by HEC. The Forum is being organized with Pakistan Science Foundation- PSF (PSF has been engaged in IBSE with French since 2010), Provincial Departments of Education and numerous other potential players on board.The lead speaker would be one of the co-founders of *La main a la pate* of France, Professor Pierre Lena of the Academy of Sciences of France. However, other major stakeholders will also contribute.

The ultimate aims and objectives of the Forum and the IBSE Programme are as under:

* Get more students studying science and mathematics at the primary and secondary school levels;
* Improve science literacy and understanding in the community;
* 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; and
* 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.
* Gain insights into activities that not only can encourage and motivate students in science through the hands-on activities but convince decision makers to pursue IBSE *La main à la pâte* for STEM education;
* Develop a national action plan for disseminating IBSE in the country;
* Define the roles of decision makers/planners in operationalising IBSE- *La main à la pâte* in the country.

**Participants of the Forum**

Forum intends to bring together all stakeholders especially the Decision Makers/Planners/High Level Government Officials (Ministers, Secretaries, Head of Organizations, etc), Curriculum Developers, Faculty of Education at Universities and Provincial Institutions for Teacher Education (PITES), Education Campaigns and NGOs engaged in education and science across Pakistan as well as media representatives.

**Venue**

Higher Education Commission of Pakistan, Sector H-9, Islamabad