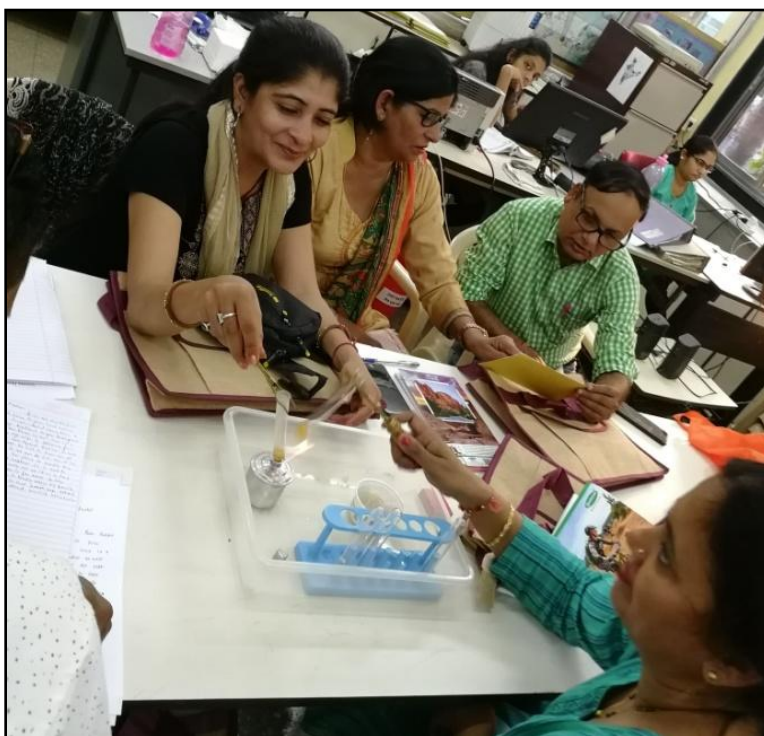


**Report of the workshop for science teachers  
organized by  
Haryana State Council for Science, Innovation and Technology &  
Homi Bhabha Centre for Science Education, TIFR, Mumbai**

**CESME, HBCSE  
(Under PMMMNMTT scheme of MHRD)**

Date: December 09-13, 2019



**Homi Bhabha Centre for Science Education  
Tata Institute of Fundamental Research  
December 2019**

The workshop for Secondary Science Teachers of Haryana State Council for Science, Innovation and Technology (HSCSIT) was organized by Homi Bhabha Centre of Science Education as part of CESME (HBCSE) activities under PMMMNMTT scheme of MHRD. Thirty-six teachers from 33 schools attended the workshop. Following is a brief report.

### **Objectives of the workshop**

1. To develop in the teachers, an in-depth understanding of fundamental facts & concepts in major scientific disciplines and science education.
2. The primary objective of the workshop was to empower teachers to be the interlinking bridges between the students & the world of science through exposure to a wide range of sessions based on science concepts, hands-on activities & demonstrations.
3. The workshop also aimed at introducing the teachers to teaching methods of teaching science, using innovative games and individual/group activities.
4. Sensitizing the teachers about inclusive education and teaching science and technology in inclusive classrooms was yet another objective of this teacher development workshop.

### **Contents of the workshop**

#### 1. Sessions based on pedagogical aspects of science education

- Way to assess Prior Knowledge
- Understanding the Concept Map
- Describe the Nature of Science
- Inclusive Science Education

#### 2. Sessions based on hands-on activities and demonstrations related to various topics in science

- Fun with science
- Understanding life processes
- The chemistry of carbon compound
- Cube: Simple model system
- Orientation to stem games
- Sound and optics
- Hands-on microscopy
- Twist in the fibres
- Experimental learning: electricity and magnetism
- Understanding chemical
- Our friendly microorganisms

Overview of some of the sessions/activities conducted in the experimental domain

Sr.No.	Lab	Sessions/activities
1	Integrated Lab	<ul style="list-style-type: none"> <li>• Demonstrations of simple experiments related to air pressure, centre of gravity etc.</li> <li>• Making homopolar motor using battery cell, Copper wire, safety pin and magnet.</li> <li>• Lectures and activities related to understanding life processes, the chemistry of carbon compounds, types of fibres, microscopy, sound &amp; optics etc.</li> </ul>
2	Cube Lab	<ul style="list-style-type: none"> <li>• Group activities, discussions related to various topics in biology.</li> <li>• Observation of drosophila, earthworm and microorganisms,</li> <li>• Orientation to stem games</li> </ul>
3	Computer Lab	<ul style="list-style-type: none"> <li>• Blink Arduino IDE by a computer program</li> </ul>

3. Visit to Nehru Science Centre & Nehru Planetarium.

### **Feedback of the workshop-**

#### Daily face to face feedback sessions

The feedback obtained from the participants, for each session, can be classified under three major categories, namely, i) the effectiveness of the workshop ii) mode of content delivery by the resource person and iii) suggestions for further improvement.

In addition, they were encouraged to share their problems related to the hospitality provided by the organizers ie. HBCSE (if any). Prompt solutions were provided to those problems.

#### Witten feedback

The teacher participants' responses collected through written feedback forms indicated that they were positive about the

- quality & quantity of the content and the level of the content, delivered in the workshop,
- use of multimedia like text, audio, images, animations, video and interactive content,
- inclusion of the latest developments in the field of science/technology education etc.

All the 36 participants advocate that the quality of the workshop was really good and the sessions were engaging. Selection of the topics and the guidance provided to the teachers during the workshop were highly appreciated by them. Most of the teachers mentioned that the activities in the workshop were relevant, feasible and doable in their school.

Some of the representative feedbacks are as follows:

### **1. Strengths of the workshop**

- Learnt different ways of Science teaching & also interesting ways to show the scientific concept.
- Helped to develop a positive attitude toward teaching science.
- Enjoy(ed) many sessions- got very good guidance and information out of (beyond) textbook; linked knowledge with real-life (nature).
- Sessions are an interdisciplinary way of relating art with science.
- Learnt how more than one model can be used to explain the different concepts effectively and also learnt that before coming to any conclusion we should do proper observations.
- Enhanced not only knowledge but also built confidence and understanding of Science Education & Technology.
- (Learnt to) assemble & dismantle the instruments without any fear.
- Appreciated and enjoyed the visit to Nehru Science Centre & Nehru Planetarium.
- Good facilities and hospitality.

### **2. Perceived weaknesses of the workshop**

- Lack of time management- More activities and less number of hours available led to fast presentations.
- Some teachers are not following timetable sincerely or not coming on regular time.
- Some participants could not think and visualize some of the scientific and technological concepts. Hence they weren't able to construct and view that instrument. They can miss this wow moment of that experiment.

### **3. Suggestions for further improvement**

- Coverage of content should be more.
- There should be more activities/practical sessions like 'Fun with Science' using available resources.
- The session should begin with activities and then the theory can be discussed. So that sessions become interesting.
- More time should be given for some activities.
- It should be focused more on learning by doing.

#### 4. Suggestions for including other topics

- Sessions like 'Makerspace' should be more. Because it's a new technology and teachers would like to learn.
- Overall the feedback of the teachers was very encouraging and perhaps visits can be conducted to follow-up about what is happening on the ground.

#### Glimpses of sessions conducted during the workshop



Activities conducted during the workshop



## Annexure A: List of Teacher Participants

Workshop for Haryana State Council for Science, Innovation and Technology (HSCSIT),  
Science Teachers

Centre of Excellence in Science and Mathematics Education (a scheme of PMMMNMTT)  
Homi Bhabha Centre for Science Education, TIFR, Mumbai

**No. of Participants** = 36 (Female = 03, Male = 33)

**No. of Schools** = 33

Sr. No.	Name of the participant	Gender	Designation	Institution
1	Saudeep	Male	TGT Science	GSSS Peoda, Kaithal-136027
2	Hardeep Singh	Male	PGT Chemistry	GSSS Peoda, Kaithal-136027
3	Mangal Singh	Male	PGT Physics	GSSS, Kaithal-2150
4	Kapil Thakral	Male	TGT Science	G.H.S. Kathwar, Kaithal-2218
5	Amit Manhar	Male	PGT Biology	GSSS Patli, Dabar
6	Prabhat Kumar Saran	Male	PGT Physics	GSSS Baragudha (4024)
7	Vinod Kumar	Male	TGT Science	GHS, Chamal
8	Sandeep Kumar Sandha	Male	TGT Science	Govt. Middle School, Jakhan, Fatehabad
9	Naveen Kumar Singla	Male	PGT Chemistry	Aarohi Model Sr. Secondary School, Sirsa
10	Mahender Attri	Male	TGT Science	GSSS, Kaunt (Bhiwani)
11	Shailesh Kumar	Male	PGT Physics	Govt. Sr. Sec. School, Leghan (432), Bhiwani
12	Kuldeep Singh	Male	PGT Chemistry	Govt. Sr. Sec. School, Beholi (2347), Kurukshetra
13	Anil Kumar	Male	PGT Physics	Govt. Sr. Sec. School, Behali (2347), Kurukshetra
14	Rajesh Kumar	Male	TGT Science	GSSS, Atelskhurd, Dadri
15	Surendra Kumar	Male	TGT Science	GSSS, Chhapan, Dadri
16	Suresh Kumar	Male	TGT Science	GSSS, Bhodia Khera, Fatehabad
17	Sudhir Sangwan	Male	PGT Biology	GSSS, Badhra, Dadri
18	Pawan Kumar	Male	PGT Physics	GSSS Bhageshwari, Dadri
19	Ashwani Kumar	Male	PGT Chemistry	GSSS, Jathlana, Yamuna Nagar
20	Rajeev Kumar	Male	PGT Physics	GSSS, Kharwan, Yamuna Nagar
21	Rakesh Kumar	Male	PGT Chemistry	GSSS Bhaini Kungar (0677), Bhiwani
22	Lakhani Ram	Male	TGT Science	Govt. Middle School, Khera, Kishoper, Bhiwani
23	Kaushal Kumar	Male	TGT Science	GGHS, Rathiwas (4232), Pataudi Gurugram
24	Vikram Singh	Male	Science Master	GSSS, Kanti (3876), Ateli, Mohinder Garh
25	Sachdev Singh	Male	TGT	G.M.S. Dhami Kojinda (4450), D.Mahinder Garh
26	Surender Singh	Male	TGT	GGSSS, Mandhana (3942), Mohindergarh

Sr. No.	Name of the participant	Gender	Designation	Institution
27	Sunil Kumar	Male	PGT Biology	GGSSS, Mandhana (3942), Mohindergarh
28	Sandeep Kumar	Male	PGT Biology	GSSS Bairawas (3861), Mohindergarh
29	Manoj Kaushik	Male	PGT Physics	SCERT Haryana
30	Sewa Rani	Female	TGT Science	G.M.S. Tabar Panchkula
31	Kamlesh Sharma	Female	TGT Science	G.M.S. Naggal Ruttal, Panchkula
32	Tilak Raj	Male	T.G.T. Science	GSSS Kharainti (2704), Rohtak
33	Sarika Chutani	Female	PGT Biology	GSSS Garnauthi (2653)
34	Kuldeep Singh	Male	T.G.T. Science	GSSS Chiri (2650), Lakhan Majra, Rohtak
35	Jitendra Nara	Male	PGT Physics	GMSSS Sanghi, Rohtak
36	Dr. Madhup Kumar	Male	PGT Biology	SCERT, Gurugram, Haryana

### **Annexure B: List of Resource persons at the workshop**

Sr.No.	Name of the Resource persons (From HBCSE)
1	Sugra Chunawala
2	Narendra Deshmukh
3	Arunan & Cube Team
4	Jude Dsouza
5	Deepa Chari
6	Vinod Sonawane
7	Vijay Lale
8	Karun Hambir
9	Rohini Karandikar
10	Meena Kharatmal
11	Mayuri Pawar
12	Pranav Khot
13	Mayuri Tawade
14	Kalpana Kharade
15	Kunda Karbhari
16	Ravi Sinha
17	Sandhya Thakur



## Annexure C: Schedule

Workshop for Haryana State Council for Science, Innovation and Technology (HSCSIT), Science Teachers

December 09-13, 2019 at HBCSE, TIFR, Mumbai

Centre of Excellence in Science and Mathematics Education (a scheme of PMMMNMTT)

Day/Time	09:00-09:30	09:30-10:45		11:00-01:00		02:00-03:45		04:00-06:00
<b>Day 1</b> 09/12/2019 <b>Monday</b>	Registration [PRO Cell]	<b>Ways to Assess Prior Knowledge</b> Narendra Deshmukh	<b>T E A  B R E A K</b>	<b>Fun with Science</b> Mayuri Pawar, Karun Hambir, Pranav Khot, Vinod Sonawane	<b>L U N C H  B R E A K</b>	<b>Understanding Life Processes</b> Sandhya Thakur, Narendra Deshmukh	<b>T E A  B R E A K</b>	<b>The Chemistry of Carbon Compound</b> Kunda Karbhari
<b>Day 2</b> 10/12/2019 <b>Tuesday</b>	Feedback VCS/KK	<b>CUBE: Simple Model System</b> Arunan and CUBE Team		<b>Orientation to STEM Games</b> Ravi Sinha Jude Dsouza		<b>Sound and Optics</b> Deepa Chari Mayuri Pawar, Karun Hambir		<b>Understanding the Concept Map</b> Meena Kharatmal
<b>Day 3</b> 11/12/2019 <b>Wednesday</b>	Feedback VDL/KK	<b>Visit to</b>		<b>Nehru Science Centre</b>		<b>&amp;</b>		<b>Nehru Planetarium</b>
<b>Day 4</b> 12/12/2019 <b>Thursday</b>	Feedback KTH/KK	<b>Describing the Nature of Science</b> Sugra Chunawala		<b>Hands on Microscopy</b> Narendra Deshmukh, Karun Hambir		<b>Twist in the Fibres</b> Vijay Lale		<b>Experiential Learning: Electricity and Magnetism</b> Vinod Sonawane, Mayuri Pawar, Pranav Khot
<b>Day 5</b> 13/12/2019 <b>Friday</b>	Feedback NDD/KK	<b>Inclusive Science Education</b> Kalpana Kharade		<b>Understanding Chemical Reaction</b> Vijay Lale		<b>Conclusion &amp; Valedictory</b>		