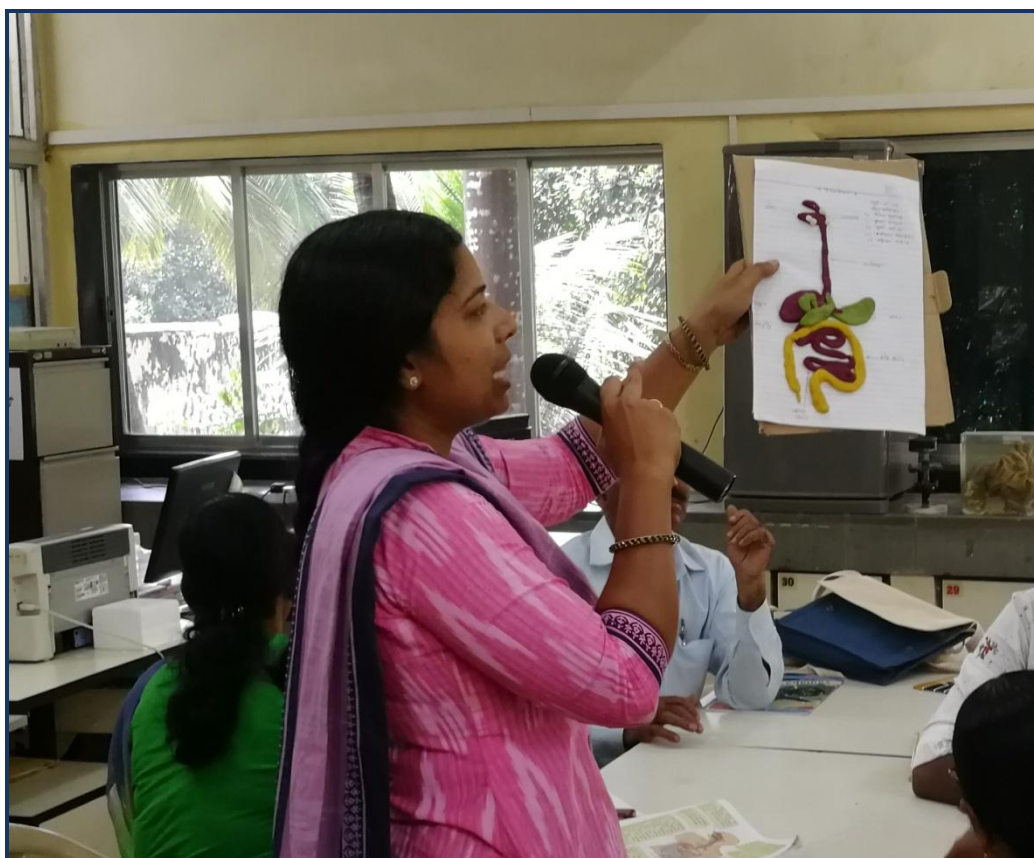


**Report of the Second Workshop for Middle School Teachers of
Residential Tribal Schools
CESME, HBCSE
(Under PMMMNMTT scheme of MHRD)**

Date: November 25-29, 2019



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

The second workshop for middle school teachers of residential tribal schools was organized by Homi Bhabha Centre of Science Education as part of CESME (HBCSE) activities under PMMMNTT scheme of MHRD. Forty one teachers from 24 schools attended the workshop. Following is a brief report.

Objectives of the project

1. To identify the professional needs of the Ashram school teachers with special reference to teaching of science and mathematics.
2. To design the faculty development programme for meeting the professional needs of the ashram school teachers.
3. To study the impact of the Faculty Development Program.
4. To develop materials and research articles based on the program.

Thematic framework of the second workshop

The workshop was designed around the following themes:

- Conceptual clarities about subject content in science and mathematics

1) Science

Systems of living organisms & skin

Sound & hearing

Simple motor & electromagnet

Cell structure & Microorganisms

Science of magnet

Exploring light

Changes- Physical

Learning Basic Astronomy

Elements, compounds, and mixtures

2) Mathematics

Area-Perimeter

Algebra Part-2

Ratio and Proportion

L.C.M. & H.C.F

- Innovative pedagogical strategies for active engagement of learners in science and mathematics classes
 Mathematics lab
 Amazing activities
 Making pinhole camera
 When teaching, while learning
- Current researches in science and mathematics education relevant to their context
Learning from research project
- Exposure to conducting action research
 Keeping observation records of students' learning (daily/weekly)
- Catering to the learning diversity in the classroom with special reference to science and mathematics education
 Inclusive science education
- Designing innovative but low cost learning resources for science and mathematics education
 Fun learning methods: Natural resources
- Designing innovative assessment tools
 Ways to assess prior knowledge
- Mode of transaction of the themes

The sessions were conducted by various transactional strategies like-

- a. Lecture cum demonstrations
- b. Hands-on-activities
- c. Group activities
- d. Assessment

The effectiveness of the workshop was assessed as follows-

Daily face to face feedback sessions - The organizers conducted daily feedback sessions with the participants in which the opinions of the participants were sought with regard to the relevance and usefulness of the content for their professional context, mode of the content delivery by the resource

persons, further enrichment in their knowledge and skills, difficulties (if any) faced by them with regard to workshop and even related to hospitality provided by HBCSE. Prompt solutions were provided to those problems.

Perception of teachers collected through written feedback

The perceived effectiveness of the workshop was found out from the participants through data collected through two kinds of written instruments. The first part helped to gather data related to the perceptions of the participants with regard to

- level of the content, delivered in the workshop,
- strategies of participants' engagement in the sessions,
- use of multimedia,
- content enrichment with respect to latest developments in the field of science/ mathematics education and
- development of confidence among the participants in designing innovative learning resources/activities.

Thus teachers had to rate the workshop on different parameters on a five point scale in which 1 denoted strongly disagree and 5 denoted strongly agree, providing the range of the perceptions of the participants.

Table 1. Average feedback scores obtained for various parameters

Sr.No.	Parameters	Average
1	The level of content chosen was just right	4.28
2	The facilitators involved me in many hands on activities	4.48
3	I enjoyed the multi-media nature of presentations	4.46
4	The sessions gave us idea about the latest developments in Science and Mathematics education	4.61
5	As a result of this training, I feel more confident now in my capacity to develop learning resources / activities creatively	4.53

The descriptive analysis showed that- the mean scores of the participants' perceptions ranged from a high of 4.61 of perceived gain in the ideas about latest development in science/mathematics education, followed by 4.53 for the perceived increase in the confidence level of the participants about designing creative learning resources/activities, 4.48 for perceived enjoyment in the engagement in activities, 4.46 for the perceived usefulness of multimedia nature of the presentations to 4.28 for the perceived level of the workshop content. The averages are all above 4 indicating the perceived effectiveness of the success of the workshop.

The second part of the survey sought the qualitative opinions of the participants in the context of their ideas for making changes in their pedagogical practices as a result of the workshop, the perceived quality of the workshop, weaknesses of the workshop, suggestions for further improvement in the organization of the workshop and suggestions for the new themes/ topics for upcoming workshops.

For this five open ended questions were asked to the participants.

1. What will you do differently in your science/mathematics lessons as a result of this workshop?
2. What do you feel were the strengths of this workshop?
3. What do you feel were the weaknesses of this workshop?
4. How can we further improve these workshops?
5. What additional areas do you require to be added in our next workshop?

The participants' responses are grouped under the consolidated themes as follows:

1. Ideas of the participants about the changes in their future pedagogical practices:

- a) Changes in content transaction- The participants are highly influenced by their learning in the workshop and expressed their desires for making changes in their day to day content transaction. Some of the changes that they wrote they would undertake are those highlighted in the workshop, namely---
 - Teaching in simple language
 - Teaching with hands on activities
 - Teaching with real life examples
 - Teaching by involving the students in experiments
 - Teaching through games
 - Using the prior learning of the students while teaching
 - Using mathematical tricks
 - Using practice exercises for consolidation of the content.
- b) Designing learning resources suitable for the local context- According to some participants they would like to design learning resources which will suit their local context as not everything learned in the workshop can be replicated there.

2. Strengths of the workshop

All the 38 participants endorsed that the quality of the workshop was very good. They attributed this success to need based selection of the themes, active engagement of the participants in the sessions,

good guidance provided and perceived relevance, feasibility and usability of the different activities shown in the workshop.

Some of the opinions were:

- Got very good guidance;
- Helped to develop positive attitude toward teaching science;
- Got information out of textbook;
- Linked knowledge with real life;
- Good facilities and hospitality.

3. Perceived weaknesses of the workshop

Majority of participants (32) could not show any weakness. Still some of them pointed at the following:

- a. Lack of time management- Less time and more activities, many activities and less number of hours available led to fast presentations, stressful, timing not as per the age of the participants;
- b. Conceptual clarity- some concepts like astronomy were difficult to understand, difficult for the students to understand, not very useful for examination point of view, need the guidance for how to perform in examination, certain concepts and activities are difficult from tribal children's point of view.

4. Suggestions for further improvement

27 participants had no suggestions for improving the quality of the workshop further. Never the less following are the suggestions given by the remaining participants:

- Timing of the workshop- Reducing the number of sessions in a day and increasing the duration of the workshop by one day, timing should not exceed from 10 to 5pm.
- Increasing the scope of participation- Involving other teachers from the school, involving the authorities in the workshop so that they too will understand the nature of the workshop.
- Transactional suggestions- using projector to show experiments and activities, making use of field trips.

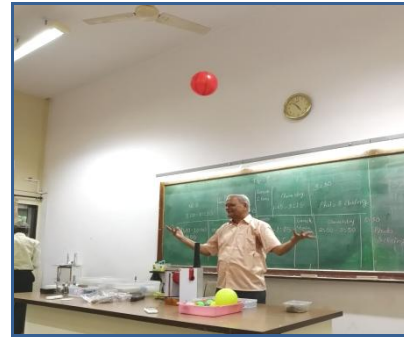
5. Suggestions for including other themes/topics

Following were the suggestions for including topics in future workshop

- Remaining topics from mathematics and science, simple interest, sound, geometrical structures, field based teaching, teaching mathematics through activity based learning.
- There were some out of the context suggestions like- training in English grammar, health and yoga, geography, history, Marathi etc. Teachers requested training students for scholarship examinations, which is not the mandate of HBCSE. This shows perhaps that the participants are not aware about the mission of HBCSE in general or they have unrealistic confidence in HBCSE

that it can solve any of their problems in education. Perhaps, a small session on the history of HBCSE, its vision and missions along with its societal contribution may be explained to the participants in future sessions.

Overall the feedback of the teachers is very encouraging and perhaps visits can be conducted to follow-up what actually is happening on the ground.



Activities conducted during workshops



Sessions conducted during the workshop



Learning by doing

Annexure A: Schedule

Workshop for Middle School Teachers of Residential Tribal Schools

November 25-29, 2019 at HBCSE, TIFR, Mumbai

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

Day/Time	09:00-09:30	09:30-11:00		11:15-12:45		01:45-03:15		03:30-05:00		05:15-06:45
Day 1 25/11/2019 Monday	Registration [PRO Cell]	Feedback & Discussion about students K. Subramaniam	Tea break 11:00-11:15	Systems of living organisms & Skin Sandhya T., Narendra D.	Lunch break 12:45-01:45	Sound & Hearing Mayuri P., Deepa C., Karun H.	Tea break 03:15-03:30	Area - Perimeter Harita R., Jeenath R., Sushant P.	Tea break 05:00-05:15	DIY: Simple Motor & Electromagnet Karun H., Pranav K.
Day 2 26/11/2019 Tuesday	Feedback Harita	Algebra Part 1 K. Subramaniam		When teaching, while learning Faruk Kazi		Cell structure & Microorganisms Sandhya T., Rohini K.		Science of magnet Vinod S., Mayuri P.		Exploring light Karun H., Mayuri P., Pranav K.
Day 3 27/11/2019 Wednesday	Feedback VDL	Inclusive science Education Kalpana Kharade		Changes - Physical & Chemical Kunda K., Prakash N.		Algebra Part 2 K. Subramaniam		Basic Astronomy Pritesh R.		Ratio & Proportion Aaloka K.
Day 4 28/11/2019 Thursday	Feedback Adithi	Learning from research projects Sugra Chunawala		Mathematics Lab Sushant P.		Making pinhole camera Deepa C., Mayuri P., Karun H.		Amazing activities Bhagwan Chakradeo		

Day/Time	08:45-09:00	09:00-10:00	10:00- 11:15		11:30-01:15		02:00-03:30	03:30
Day 5 29/11/2019 Friday	Feedback NDD	Ways to assess prior knowledge Narendra Deshmukh	L.C.M & H.C.F	Break 11:15-11:30	Fun learning methods : Natural Resources Adithi M., Anisha M., Rupali S., Arundhati D.	Lunch break 01:15-02:00	Elements, Compounds & Mixtures Vijay L.	Conclusion & Valedictory

Annexure B: List of Teacher Participants

Workshop for Middle School Teachers of Residential Tribal Schools
Centre of Excellence in Science and Mathematics Education (a scheme of PMMMMNMTT)
Homi Bhabha Centre for Science Education, TIFR, Mumbai

No. of Participants = 41 (Female = 12, Male = 29)

No. of Schools = 24

Sr. No.	Name of the participant	Gender	Designation	Institution
1	Mrs. Shaila Vishwas Thakur	Female	Asst. Teacher	Ashram School, Chikhli, Panvel
2	Nayana Narayan Warde	Female	Asst. Teacher	Govt. Ashram School, Savarsai
3	Vitthal Laxman Pandhare	Male	Asst. Teacher	Govt. Ashram School, Varvane, Pen, Raigad
4	Mithun Madhukar Jogalekar	Male	Asst. Teacher	Govt. Ashram School, Sanegaon, Roha, Raigad
5	Digambar Subhashrao More	Male	Asst. Teacher	Govt. Ashram School, Sanegaon, Roha
6	Meghana Mukund Bhadavalkar	Female	Asst. Teacher	Aided Primary Ashram School, Padsare, Sudhagad
7	Arun Appa Karade	Male	Asst. Teacher	Govt. Secondary Ashram School, Verul, Mandangad
8	Vijaya Vikas More	Female	Asst. Teacher	Govt. Ashram School, Chaphewadi, Karjat
9	Surekha Ashok Kamble	Female	Asst. Teacher	Govt. Ashram School, Dolivali
10	Krishna Hari Wargude	Male	Asst. Teacher	Aided Madhyamik Ranpakharan Ashram School, Varap
11	Namdev Barkya Bhukare	Male	Asst. Teacher	A.S. Ashram School, Wakadi
12	Ratnakar Maruti Keni.	Male	Asst. Teacher	Aided Ashram School, Wakadi
13	Khandu Maruti Pichad	Male	Asst. Teacher	Aided Prathamik Ashram School, Chirner, Uran
14	Purna Janardan Patil	Female	Asst. Teacher	Govt. Ashram School, Bhaliwadi, Karjat, Raigad
15	Sashikala T. Birajdar	Female	Asst. Teacher	Govt. Ashram School, Bhaliwadi, Karjat, Raigad
16	Surekha Pramod Patil	Female	Asst. Teacher	Govt. Secondary Ashram School, Varavane
17	Vijay Baliram Patil	Male	Asst. Teacher	Govt. Ashram School, Varsai
18	Dnyaneshwar Anantrao Shinde	Male	Asst. Teacher	Govt. Secondary & Higher Sec. Ashram School, Pathraj, Karjat

Sr. No.	Name of the participant	Gender	Designation	Institution
19	Mahadeo Chandrakant Doiphode	Male	Asst. Teacher	Aided Primary Ashram School, Chirner
20	Sudhir Dnyanoba Bansode	Male	Asst. Teacher	Govt. Secondary High & Higher Sec. Ashram School, Pathraj, Karjat
21	Nilesh Krishna Sonavane	Male	Asst. Teacher	Govt. Secondary Ashram School, Dolivali
22	Dipali Santosh Gharat	Female	Asst. Teacher	Aided Ashram School, Padsare, Tal- Sudhagad
23	Suresh Hasha Kokate	Male	Asst. Teacher	Aided Ashram School, Wavlooli, Tal- Sudhagad
24	Vaijnath Damodar Zinje	Male	Asst. Teacher	Govt. Ashram School, Sawarsai
25	Rupesh Ramesh Khopade	Male	Asst. Teacher	Aided Ashram School, Chive, Tal - Sudhagad
26	Sunil Chandrakant Niwate	Male	Asst. Teacher	K.B.H. Aided Primary Ashram School, Taloshi
27	Baburao Manik Ghodake	Male	Asst. Teacher	Govt. Ashram School, Veral
28	Dinesh Sadanand Patil	Male	Asst. Teacher	Govt. Ashram School, Sai, Panvel
29	Krishna Narayan Mokal	Male	Asst. Teacher	Govt. Ashram School, Sai, Panvel
30	Manoj Dayal Sakharkar	Male	Asst. Teacher	Aided Ashram School, Mangaonwadi
31	Nitin Narayan Nikam	Male	Asst. Teacher	Aided Ashram School, Mangaonwadi
32	Chintaman Dattatrey Dabir	Male	Asst. Teacher	Aided Ashram School, Chive, Sudhagad
33	Milind Prabhakar Patil	Male	Asst. Teacher	Govt. Ashram School, Kolghar, Alibaug
34	Jagdish Changu Mengal	Male	Asst. Teacher	Govt. Ashram School, Kolghar
35	Vijay Sudam Pawar	Male	Asst. Teacher	Govt. Primary School, Nandvi, Mangaon
36	Anuradha Jaywant Gurav	Female	Asst. Teacher	Eklavya Ashram School, Wavlooli
37	Kirti Krishna Bhoir	Female	Asst. Teacher	Aided Madhyamik Ranpakharan Ashram School, Varap
38	Usha Laxman Pawar	Female	Asst. Teacher	Govt. Ashram School, Varsai
39	Ravindra Ganpatrao Kalambhe	Male	Asst. Teacher	Govt. Ashram School, Chafewadi, Karjat
40	Arun Ganu Patil	Male	Asst. Teacher	Aided Ashram School, Uttekhhol, Mangaon
41	Rama Motiram Madage	Male	Asst. Teacher	Aided Ashram School, Uttekhhol, Mangaon

Annexure C: List of Resource persons at the workshop

Resource Persons (HBCSE)	Resource Persons (non-HBCSE)
Aaloka K.	Bhagwan Chakradeo
Adithi M.	Faruk Kazi
Anisha M.	
Arundhati D.	
Deepa C.	
Harita R.	
Jeenath R.	
K. Subramaniam	
Kalpana Kharade	
Karun H.	
Kunda K.	
Mayuri P.	
Narendra D.	
Prakash N.	
Pranav K.	
Pritesh R.	
Rohini K.	
Rupali S.	
Sandhya T.	
Sugra Chunawala	
Sushant P.	
Vijay L.	
Vinod S.	