

epiSTEME 8
**Eighth International Conference to Review Research in
Science, Technology and Mathematics Education**

Homi Bhabha Centre for Science Education, Mumbai

3—6 January, 2020

Conference Program

The epiSTEME 8 conference includes nine review talks, nine paper sessions, one poster session, one panel discussion, and one post-conference workshop.

Each of the nine review talks will be for 60 minutes (~45 minutes talk and 15 minutes for discussion).

There will be nine Paper Sessions spread over the four days, in which a total of 30 oral presentations will take place. The time allotted for each paper is 20 minutes, which includes 15 minutes of presentation, followed by a 5 minute Q&A. A laptop compatible with windows, mac, linux., LCD projector and PA system will be available in the auditorium.

There will be a 1 hour 30 min poster session, in which 22 posters will be displayed. During the poster session, the presenters of the poster papers will interact with the conference participants and explain their posters. Please check the **poster guidelines** on **page 8** for preparing posters.

The post conference workshop, scheduled on 7th January, 2020 by Prof. Richard Lehrer (Vanderbilt University, USA) and Dr. Pratim Sengupta (University of Calgary, Canada). The details of the workshop will be available on the website soon.

Apart from these academic programs, there will be evening activities: a banquet dinner, a cultural program, and a cultural excursion to the suburbs. There will be lunch and tea breaks between talks.

A detailed schedule of the programme can be found below.

DAY 1—January 3 Friday

08:00—09:00 AM	Registration	
09:00—09:15 AM	Welcome: Centre Director, HBCSE And conveners	
09:15—10:15 AM	Review Talk 1	Inducting Children In The Epistemology Of Modeling <i>Richard Lehrer</i> Chair: Deepa Chari
10:15—10:45 AM	Tea	
10:45—11:45 AM	Review Talk 2	Building Hybrid Minds: Pedagogy In The Age Of Learning Machines <i>Sanjay Chandrasekharan</i> Chair: Ayush Gupta
11:45 AM—12:05 PM	Paper Session 1	Designing Computational Models As Emergent Systems Microworlds To Support Learning Of Scientific Inquiry <i>Sugat Dabholkar And Uri Wilensky</i>
12:05—12:25 PM		Learning Basic Astronomy Through An Embodied And Interactive Approach <i>Rafikh Shaikh, Shamin Padalkar, Glenda Stump, Prayas Sutar And Arunachal Kumar</i>
12:25—12:45 PM		Chair: Urmi Ghosh Meaningful Problem Solving With Schema Based Instruction <i>Vijesh K And Dr. Manoj Praveen G</i>
12:45—12:55 PM	Concluding Remark By Chair	
12:55—02:00 PM	Lunch	
02:00—02:20 PM	Paper Session 2	Exploring Mathematical Explorations <i>Jayasree Subramanian, K Subramaniam And R Ramanujam</i>
02:20—02:40 PM		Concept Images Of Quadrilaterals: A Comparative Study Of Elementary And Secondary School Students <i>Jasneet Kaur</i>
02:40—03:00 PM		Exploring Students' Algebraic Reasoning On Quadratic Equations: Implications For School-based Assessment <i>Angel Mukuka, Sudi Balimuttajjo And Vedaste Mutarutinya</i>
03:00—03:20 PM		Mathematical Exploration Encouraging Mathematical Processes In A Classroom <i>Harita Raval, Aaloka Kanhere And Jayasree Subramanian</i>
03:20—03:40 PM		Chair: Aaloka Kanhere Missed Opportunities: Instances From Geometry Lessons <i>Saurabh Thakur, Arindam Bose And Ruchi Kumar</i>
03:40—03:50 PM	Concluding Remark By Chair	
03:50—04:20 PM	Tea	
04:20—05:20 PM	Review Talk 3	Logic In School Mathematics: The Outsider At The Window <i>R Ramanujam</i> Chair: K. Subramaniam
05:20—06:00 PM	Free Time	
06:00—10:00 PM		

Day 2—January 4 Saturday

09:00—10:00 AM	Review Talk 4 Chair: Sapna Sharma	Perspectives On Conceptual Change And Its Nexus With Identity <i>Olivia Levrini</i>
10:00—10:20 AM	Paper Session 3 Chair: Aswathy Raveendran	Supporting Undergraduate Underrepresented Minority Students For Success In Stem <i>Nadia Stoyanova Kennedy, Urmi Ghosh-dastidar, Sandie Han, Diana Samaroo And Armando Solis</i>
10:20—10:40 AM		"They're All Going To Hear You Being Silly": Challenging Deficit Views Of Mathematics Classroom Participation <i>Arundhati Velamur</i>
10:40—11:00 AM		STEME Teachers' Transformative Learning In Rural India: Bridging A Cultural Gap <i>Rekha Koul And Rachel Sheffield</i>
11:00—11:10 AM	Concluding Remark By Chair	
11:10—11:40 AM	Tea	
11:40—12:00 PM	Paper Session 4 Chair: Innocent Uwineza	Frameworks And Affordances For Internationally Distributed Collaboration (Idc) Between School-aged Stme Learners <i>Eric Hamilton, Danielle Espino And Seung Lee</i>
12:00—12:20 PM		Indian Students' Understanding Of Particulate Nature Of Matter <i>Puneeta Malhotra</i>
12:20—12:40 PM		Beyond Content And Skills: Misaligned Epistemological Beliefs For Science And Biology Learning <i>Kyriaki Chatzikyriakidou And Melissa Mccartney</i>
12:40—12:50 PM	Concluding Remark By Chair	
12:50—02:00 PM	Lunch	
02:00—03:00 PM	Review Talk 5 Chair: G. Nagarjuna	Concepts Metaphors And Conceptual Changes In Science Learning: A Conceptual Metaphor Perspective <i>Tamer Amin</i>
03:00—03:30 PM	Tea	
03:30—03:50 PM	Paper Session 5 Chair: R. M. Bhatt	Exploring Angles In A Programming Environment <i>Erell Germia And Nicole Panorkou</i>
03:50—04:10 PM		Examining The Role Of Covariational Reasoning In Developing Students' Understanding Of The Greenhouse Effect <i>Debasmita Basu And Nicole Panorkou</i>
04:10—04:30 PM		The Conditions, Context And Character Of Children's Questions In An Outreach Program <i>Debashree Sengupta, Dharmavarapu Chandrika, Bishal Dey And Jayashree Ramadas</i>
04:30—04:50 PM		Exploring The Use Of Deductive Logic In Geometry As A Tool For Cognitive Growth <i>Preety Tripathi</i>

04:50—05:00 PM	Concluding Remark By The Chair
05:00—6:30 PM	Free Time
06:30—08:00 PM	Cultural Programme

Day 3—January 5 Sunday

09:00—10:00 AM	Review Talk 6 Chair: Anwesh Mazumdar	Half A Century Of Research On Alternative Conceptions/ Misconceptions In Science Education:What Has Changed? <i>Manjula Sharma</i>
10:00—11:30 AM	Panel Discussion on Towards a pedagogy of liberal arts Panelists: <i>K Sridhar, Punya Mishra, Pratim Sengupta, Meera Nanda, Sindhuja Bhaktavatsalam</i>	
11:30—12:00 PM	Tea	
12:00—12:20 PM	Paper Session 6	Modelling In Design-and-make: Synthesis Of Biological Cell Into A Board-game <i>Ritesh Khunyakari</i>
12:20—12:40 PM	Chair: Ankush Gupta	Designing And Making Roller Coasters By Indian Middle School Students <i>Anisha Malhotra-dalvi, Adithi Muralidhar, Arundhati Dolas, Rupali Shinde And Sugra Chunawala</i>
12:40—01:00 PM		Building A "Technical Culture": Experiences Of Engineering Students In A Technical Institute <i>Aswathy Raveendran</i>
01:00—01:10 PM	Concluding Remark By The Chair	
01:10—02:15 PM	Lunch	
02:15—03:15 PM	Review Talk 7 Chair: Reema Mani	The Attractiveness Of A Topic Approach To Improving Pedagogical Content Knowledge Of Teachers—Lessons From Research In South Africa <i>Marissa Rollnick</i>
03:15—03:45 PM	Tea	
03:45—04:05 PM	Paper Session 7	Ethics And Science Education In A Wicked World <i>Ajay Sharma</i>
04:05—04:25 PM		From Charanamrit To Gangajal Via Brindawan-mathura-kashi: Cultural Politics Of Word-problems In Saraswati Shishu Mandir Mathematics Textbooks <i>Kishore Darak</i>
04:25—06:00 PM	Poster Session	<i>Details Available Below</i>
06:00—6:30 PM	Free Time	
06:30—11:00 PM	Banquet dinner	

Day 4—January 6 Monday

09:00—10:00 AM	Review Talk 8 Chair: Jasneet Kaur	<i>Levels of abstraction in school arithmetic</i> <i>Liping Ma -- this talk will be delivered through Skype</i>
10:00—10:30 AM	Tea	
10:30—11:30 AM	Review Talk 9 Chair: Ajay Sharma	School Science, Equality And Fairness <i>Ralph Levinson</i>
11:30—11:50 AM	Paper Session 8	Nature Of Science: Embedding School Science In Its Epistemological Perspectives <i>Ajeet Rai And Shailendra Kumar</i>
11:50—12:10 PM		<i>Asibizi: Teaching Human Reproduction In Rural Eastern Cape Schools:</i> <i>Ayanda Simayi And Paul Webb</i>
12:10—12:30 PM		Analysing Water-related Topics In Science Textbooks From Sustainability And Social Justice Perspectives <i>Meenakshi Kaushik</i>
12:30—12:50 PM		Developing A Relational Understanding Of The Equal Sign In Early Years <i>Neet Priya Bajwa,</i>
12:50—01:00 PM	Concluding Remark By Chair	
01:00—02:00 PM	Lunch	
02:00—02:20 PM	Paper Session 9	Metaphor-equipped Teaching Of Linear Algebra <i>Praveen Chhikara</i>
02:20—02:40 PM		Incorporating Steam Pedagogy In Teaching Mathematics <i>Binod Prasad Pant, Bal Chandra Luitel And Indra Mani Shrestha</i>
02:40—03:00 PM		Reflections From Hands-on Science Workshops For Teachers: 'listening' To Teachers <i>Anish Mokashi, Gurinder Singh And Honey Singh</i>
03:00—03:10 PM	Concluding Remark By The Chair	
03:10—03:30 PM	Tea	
03:30—04:30 PM	Closing And Concluding Remarks	
04:30—05:00 PM	High Tea	
08:00 PM	Dinner	

List of Poster Presentations

ID	Title of the Paper	Name(s) of the Author(s)
S101	Science and Scientific Temper	<i>Arpita Sharma</i>
S202	Developing 21st Century Skills And Stem Knowledge In Pre-service Teachers Using Makerspace	<i>Rachel Sheffield and Rekha Koul</i>
S202	Definition of an Artificial Intelligence Engine for Mathematics Education	<i>Shankar Moni, Jaya Swaminathan, Sheloney Moni and Shalini Sinha</i>
S203	Learning Control System Design Using Nano Drone In A Pbl Focused Online Robotics Competition	<i>Fayyaz Pocker Chemban, Rishikesh Madan and Kavi Arya</i>
S204	Middle-schoolers Primed To Reason Counterfactually Ask More Interesting Questions	<i>Sneha Chakravarty, Anveshna Srivastava and Koumudi Patil</i>
S206	Knowledge Representation- In Eye Through Eye With Birds	<i>Venessa Silveira and Clive Paiv</i>
S207	Eliciting Argumentative Reasoning Among Secondary School Children Using Scenarios And Counter-evidences On Social Issues	<i>Pranshi Upadhyay</i>
S301	Digital Collaborative Environments: Connecting Theory Of Inscriptions Do The Design And Development Of Student Resources	<i>Amit Sharma and Alden J. Edson</i>
S302	Characterising School Student Discourse When Engaged With Contemporary Biological Research	<i>Ralph Levinson, Haira Gandolfi, Irene Hadjicosti, Paul Davies, Constantinos Korfiatis and Stephen Price</i>
S303	Improving The Higher Order Thinking Skills In Middle School Students Using Active Learning Pedagogy	<i>Sukanya Ramani, Anasuya Sharma and Sridevi S</i>
S305	Teaching Practice in Rwandan Chemistry Classroom	<i>Byusa Edwin, Kampire Edwige, Mwesigye Rwekaza Adrian</i>

- S306** Conscious Teacher Training: Supporting Inner Development Along With Developing Skills And Competencies *Sanjeev Ranganathan, Saranya Bharathi, Arun Iyyanarappan, undranandhan Kothandaraman, Poovizhi P, Pratap G, Ranjith P, Logeshwari S, Abilash S, Anupama A, Naveen K, Sandhya P, Murali M and Prabha P*
- S307** Teachers' Perception On Implementing Hots In Science Education *Nisha Prajapati and R. G. Kothari*
- S308** Students' Engagement With A Chapter On 'food Preservation' *Rohini Karandikar and Rupali Shinde*
- S309** Wem: An Av-tool For Motivation In Engineering Mathematics *Rachana Desai*
- S401** Particle In A Confining Potential: Development Of Concept Inventory And Identifying Students Alternative Conceptions *Sapna Sharma and P.K. Ahluwalia*
- S402** Informal Learning Environment To Communicate Science: An Open Day Event At The Indian Institute Of Science, Bangalore *Surabhi Kulkarni, Athavan Alias Anand Selvam, Vinay Babu Ramesh and Hotha Srinivas*
- S403** A Student-centric Approach For Developing Scientific Communication Skills In Undergraduate Microbiology Students *Aparna Talekar, Vivien Amonkar and Karuna Gokarn*
- S404** Survey Of Student Understanding Of Electric Force And Field *Santosh Umar, Ashok Mittal and Vivek Tiwari*
- S405** Undergraduate Students' Mental Models Of Electrostatic Potential *Dr. Mahima Chhabra and Ritwick Das*
- S406** Measuring students' emotional engagement in Physics : AEQ-PhysicsPrac *Aesha Bhansali, Manjula Sharma*
- S407** Problem Posing in Classroom of Mathematics *Pramod Sagar*
- S408** TBA *Manju Chauhan*

Guidelines for poster presentation

- Posters will be displayed in a separate room in the conference venue. Your poster will be identified by your paper ID.
- Each poster presenter will be provided with one poster board of size 4 feet(W) x 3 feet(H) (i.e. landscape mode) for their poster display. Presenters should prepare their posters accordingly.
- Tape / pins will be available to mount the posters to the boards.
- The poster session is scheduled for Day 3, January 5, 2019 at 4.25pm. During this session, conference attendees will walk through, visit your poster and interact with you.
- Please be available next to your poster during this time to explain your work and answer questions. There will be no formal presentations.
- Posters will be up throughout the duration of the conference. Conference attendees are also likely to visit your poster during Tea breaks, so you can use Tea breaks too for explaining your poster.
- Please make sure your poster has the title displayed at the top, and the author names.
- Additional tips - Effective posters:
 - Invite attention
 - Present a clear message
 - Have a balance of graphics and text
 - Have self-explanatory tables and figures
 - Organize materials coherently
 - Maintain a logical sequence, requiring no further explanation Are based on evidence, thereby appealing to a critical audience
 - Have large size of fonts in text, figures and tables, so as to be easily readable and visible from a distance (of say, 1.2m or 4 feet)
- Some additional links on poster presentations:
 - <http://people.eku.edu/ritchisong/posterpres.html>
 - <http://colinpurrington.com/tips/poster-design>