

HBCSE Graduate Programme and Outreach

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Ph.D in science education in India

- Masters in science, technology or in any of the social/ behavioural sciences/ education (with or without experience)
- Flexible with respect to age
- Interdisciplinary programme
- Open to scientific staff also

Early Exit option: M.Phil Degree at the end of Year 3

Graduate Course Structure

- Core Courses – 24 Credits
- Foundational Electives + Electives – 12 Credits
- Field Work – 8 Credits

Total Credits to be accumulated
at the end of 4 semesters – 44 Credits

Graduate Course

Core Courses

- History of Science
- Cognition, Cognitive Development and Learning
- Introduction to Science & Mathematics Education Research
- Teaching Practice & School Internship/Design of Learning Resource
- Philosophy of Science
- Methods of Science & Mathematics Education Research
- Advanced Research Methods

Foundational Elective Courses

- Philosophy of Education
- Education, Society and Education policy in India

Elective Courses

- Advanced Philosophy of Science
- Introduction to STS
- Language and Science
- Philosophy of Technology
- Advanced Cognitive Science
- Science Communication
- Mathematics Education Research
- Science Education, Research (PER, CER).....

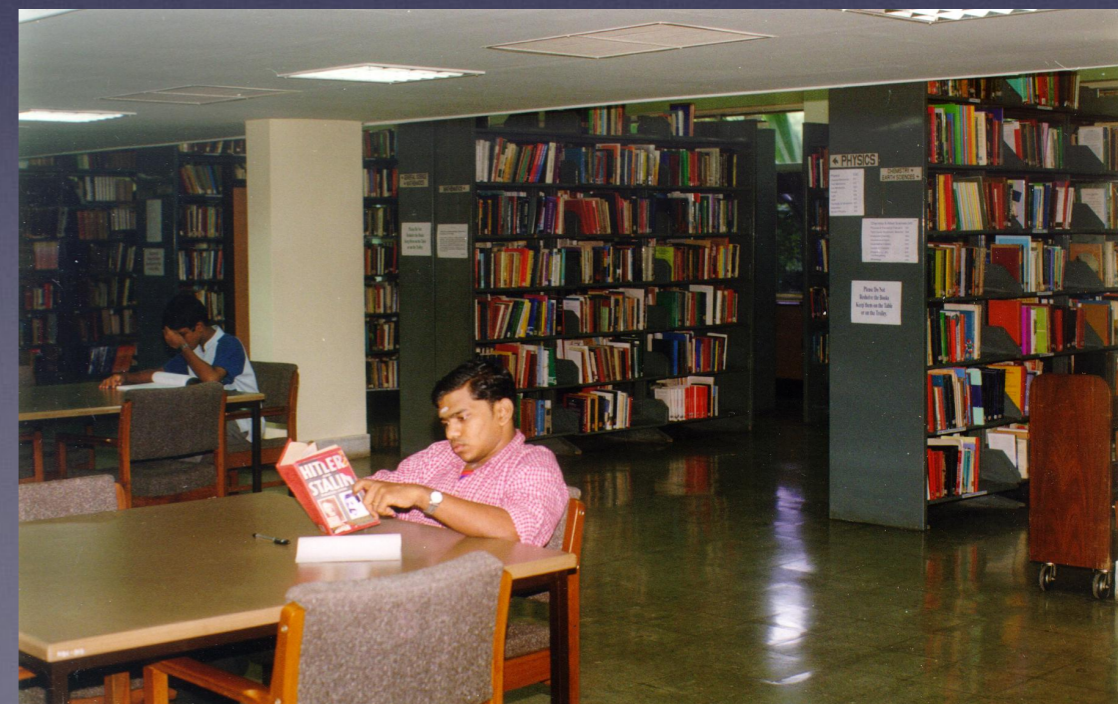
FIELD WORK

Admission to Ph.D Programme

Year	No. of students applied	Students called for interview	Students appeared for interview	Selected	Joined
2008	750	60	48	4	3
2009	285	58	50	6	5
2010	293	40	36	5	3
2011	725	41	31	5	2
2012	492	42	36	4	4
2013	426	36	31	0	0
2014	523	45	37	9	6
2015	738	44	30	5	4
2016	727	43	36	5	4

Facilities offered

- Scholarship for 5 years, with leave
- Contingency Grant
- Knowledge Exchange Scheme
- Medical, including counselling
- Library
- Hostel
- Gym and Sports; Yoga
- Women's Cell



Academic progress

- Thesis Advisory Committees
- Annual Progress Review by SB
- Written comprehensive (at the end of 2 semesters) and Oral comprehensive (at the end of 4th semester)
- Ph.D. research proposals vetted by SB
- Publication requirement
- Ph.D. synopsis seminars

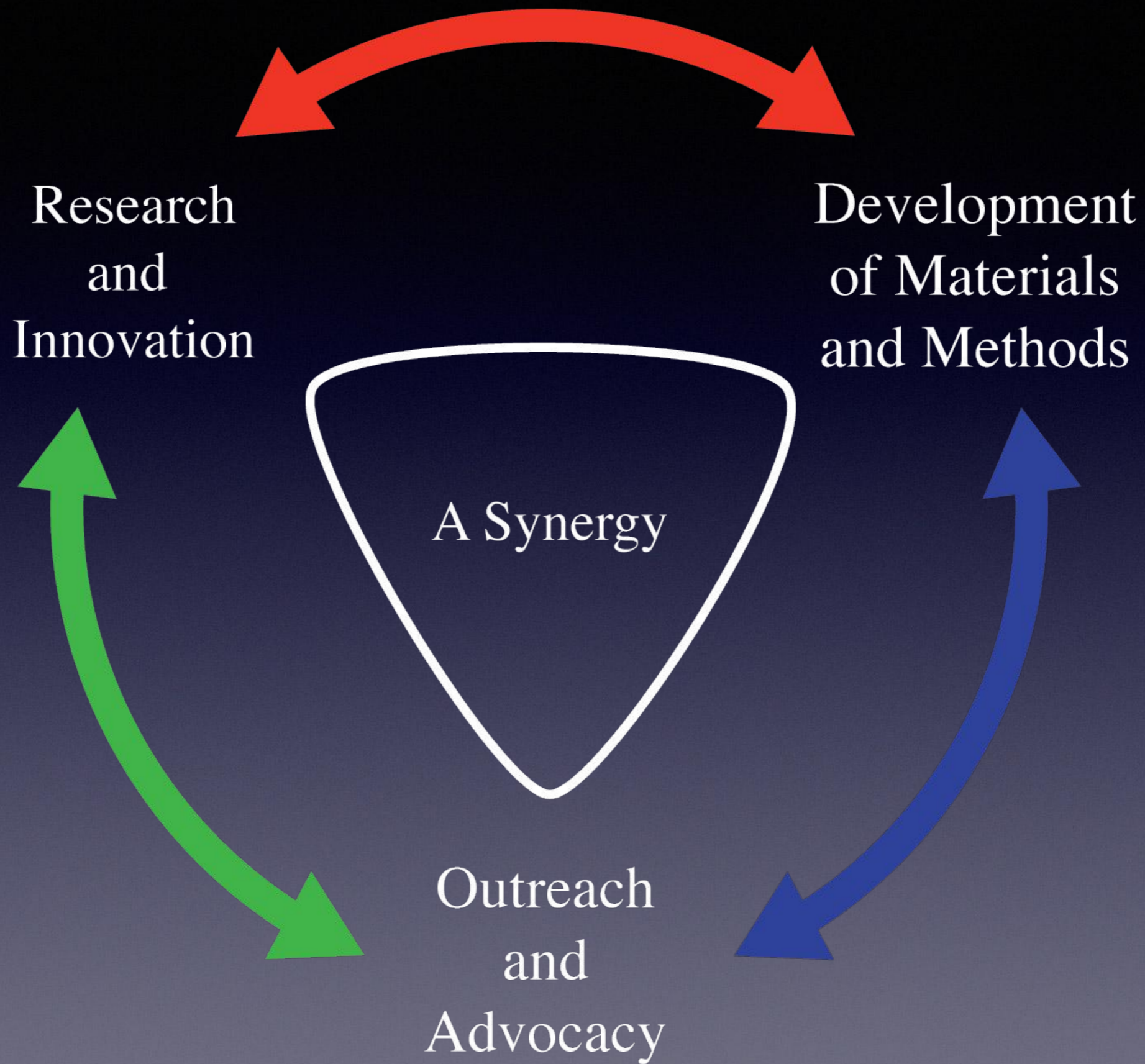
Ambience

- Pre-selection orientation programme
- Freshers Party
- Visits to labs/ meeting with research groups
- Mentoring by seniors
- Organising ARM



Research Scholars

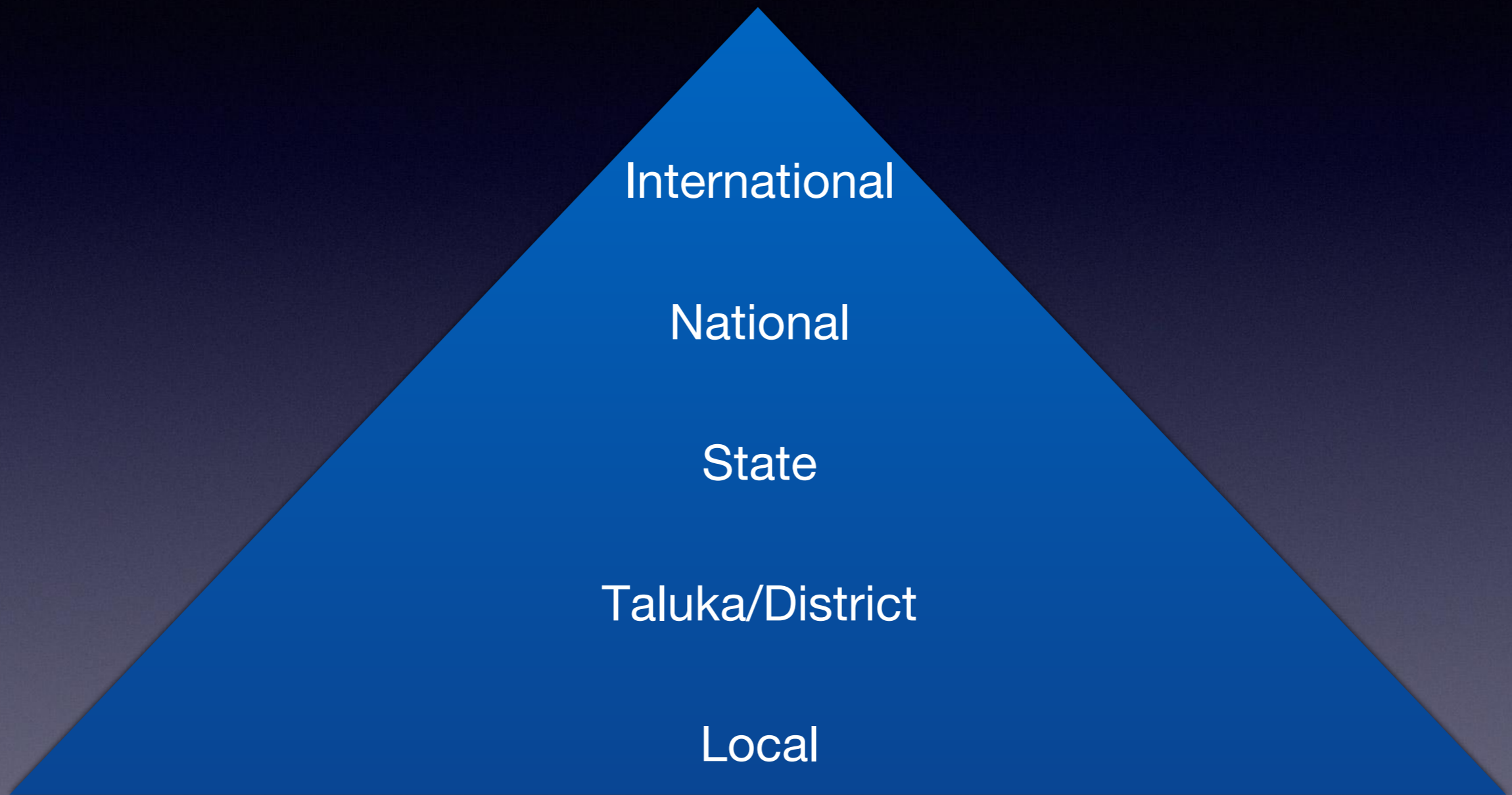




Outreach

- Students (Nurture & Remedial)
- Teachers
- Teacher Educators
- DIET/ SCERT/ NCERT
- Education Officers – Administrative
- Policy makers

Outreach



Levels of our outreach programmes

TPD Philosophy

- Based on
 - “need assessment”
 - “theme oriented”
- Inquiry based science learning
- Teaching learning resource material development
- Assessment and evaluation

TPD strategies

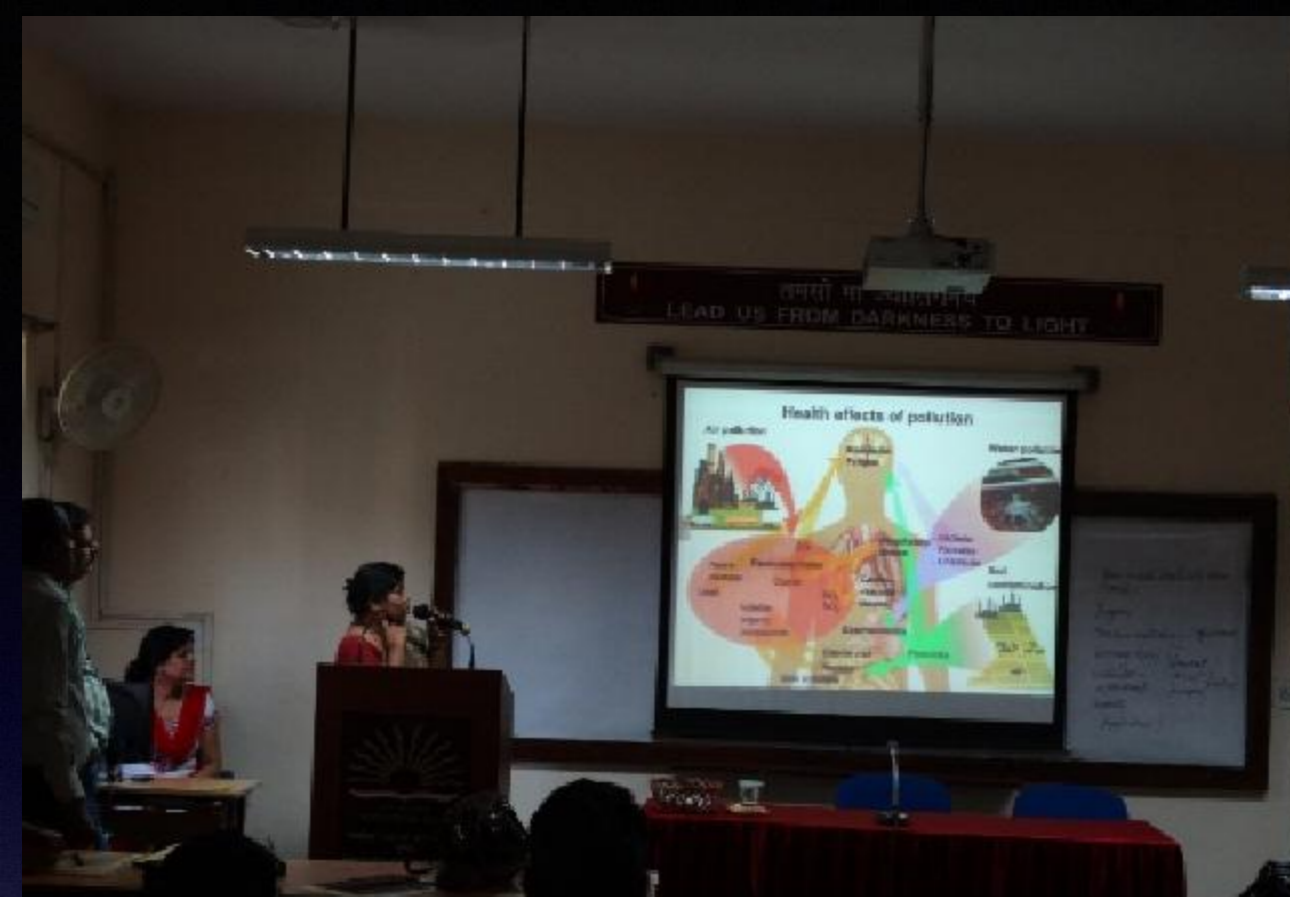
- Content discussion
- Research readings, Textbook analysis
- Exhibitions and videos
- Pedagogic guidelines: Constructivist pedagogy;
- Hands on opportunities, designing activities and experiments
- Enrichment sessions
- Guidance for reflective thinking and action research
- Nature of science / socio-cultural aspects of science education

TPD partners

- Ministry of Human Resource Development Projects
 - (Bihar, West Bengal)
- State Council of Educational Research & Training (SCERT) and District Institute of Education & Training (DIETS)
 - (Karnataka, Uttarakhand, Gujarat)
- Central Board of Secondary Education (CBSE) Schools
 - (Kendriya Vidyalaya Zonal Institute of Education and Training (KV-ZIET), Atomic Energy Central Schools (AECS))
- Independent TPD workshops
 - (on request)
- School Science Research and Development (SSRD)
 - Participatory Action Research (PAR)



Short course to enhance Science Education in Sri Lanka, July 2016



Teachers presenting their project at a PBL workshop



Teachers engaged in a "nature of science" activity



Teachers engaged in an collaboration exercise



An interactive session on design & technology education

TPD 2015-2016

Events	No. of science and maths workshops	Participants (Pre-service, inservice /education officers)
One/Two day exposure workshops	28	1065
Three days project based workshops	3	60
Five days capacity building / TPD workshops	7	210
Two weeks intensive course / refresher course workshops	4	85 foreign nationals

Networking and Collaboration through TPD programmes

- Government Organisations

MHRD, SCERT, DIET

- Non- Government Organisations

Pratham, Eklavya, Hemendra Kothari Foundation, Royal Society of Chemistry, Indian Women Scientists' Association, Rayat Vigyan Parishad, Shivaji Vigyan Parishad, Vigyan Parishad Prayag

- Teacher Associations

Indian Association of Physics Teachers, **IAPT**; Association of Chemistry Teachers, **ACT**; Mumbai Science Teachers Association, **MSTA**, Association of Teachers in Biological Sciences, **ATBS**

Yashwantrao Chavan Maharashtra Open University- Post Graduate Research Programme

- Study centre since 2000
- M.A/ M.Sc/ M.Com- Subject communication and Educational communication
- Strong research component
- Around 10-14 workshops a year
- Each batch has around 70 students (in-service teachers, professionals)
- Over 1500 teachers trained and counselled under this programme

Outreach: Science Popularization

National Science Day

Open day at HBCSE, over 1500 visitors on a day



Science Popularization

Homi Bhabha Bal Vaidnyanik Competition



Human Resource Development

- Teacher fellowship scheme
- Student interns
- Library interns
- Short term visitors
- Visiting post doctoral fellows

Outreach and Networking

- HBCSE members serve in various capacities with
 - State Government book writing committees
 - National Council of Educational Research and Training
 - National Curriculum Framework
 - Teacher Education Colleges (LMC, external examiners, board members)
 - Involvement with RMSA, SSA