



Grade IV students of Gram-Mangal school Vikramgad using the Small Science curriculum

SCHOOL SCIENCE RESEARCH AND DEVELOPMENT

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HBCSE Review, October 19, 2014

School Science R&D

- 40 years at HBCSE - initiated by V. G. Kulkarni, R. G. Lagu, S. C. Agarkar, V. G. Gambhir, B. S. Mahajan and others.

My motivation

- To understand students' thinking in order to design teaching
- To develop a reasoned basis for activity-based science learning
- To contribute to research based models of teacher professional development (TPD)

Areas of Work

- Curriculum development and evaluation
- Classroom interaction
- Cognitive studies of science learning
 - ~ Students' alternative conceptions
 - ~ Students' epistemologies
 - ~ Diagrammatic representations
 - ~ Visuospatial reasoning
- Design of TPD workshops

Outcomes-1

- Initiated study of students' conceptions (1978)
- Conceptions about light, motion, living and non-living, human body systems, elementary astronomy, Galilean relativity (citations for 3 papers >50) (with students and colleagues)
- More studies at HBCSE – chemical bonding, heat and thermodynamics, health, evolution
- Homi Bhabha Curriculum for Primary Science (with J. Vijapurkar and others)

Outcomes-2

- Initiated study of diagrammatic reasoning, visualisation and spatial cognition in science education (since 1980s)
- Pedagogic role of gestures, embodied cognition
- IJSE Special Issue, 2009 (citations for 4 HBCSE papers >70)
- Results taken up in teacher education curricula - NCERT, Rajasthan Govt.

Future Plans

- SSRD group at HBCSE (5 scientific officers, 5 faculty, 5 resource websites)
- Visuospatial reasoning in school science
- Modules for teacher professional development
- Popular writing for parents and policy