

**STEM Teacher Training Workshop on
Research Based Pedagogical Tools (RBPTs)**
3rd, 4th and 5th August, 2017

Sponsored by



**Indian Institute of Science Education
and Research (IISER), Pune**

Organised by



**Lakhimpur Girls' College
North Lakhimpur, Assam**

Knowledge Partners



LEAD TRAINER

Dr. Mridul Buragohain

Department of Chemistry
Lakhimpur Girls' College
North Lakhimpur, Assam

SUBJECT TRAINERS

- **Dr. Bandana Gogoi**
Department of Physics
D.N. Govt College
Itanagar, Arunachal Pradesh
 - **Dr. Saitanya Bhardwaj**
Department of Chemistry
Pragjyotish College
Guwahati, Assam
 - **Dr. Parag Nath**
Department of Biotechnology
Kaliabor College
Nagaon, Assam
 - **Dr. Amar Jyoti Dutta**
Department of Mathematics
Pragjyotish College
Guwahati, Assam
-

Supported by Department of Biotechnology (DBT) / Department of Science and Technology (DST), Govt. of India. Knowledge partner: Newton Bhabha Fund

**Regional Workshop on Research Based Pedagogical Tools – Lakhimpur
3 - 5, August 2017 at Lakhimpur, Girls' College, Assam**

* Required

1. First Name *

Your answer

2. Last Name *

Your answer

3. Contact Number *

Your answer

4. Gender *

Female

Male

5. Email Id *

Your answer

6. Designation *

Your answer

7. Department *

Your answer

8. Name of College/Institute: *

Your answer

9. Address of College/Institute *

Your answer

10. Is your College/Institute a Government or Government-aided College/Institute? (If 'Other' , please specify) *

Government

Government-aided

Private

Other:

11. Educational Qualification (If 'Other' , please specify) *

PhD

M.Sc

Other:

12. Teaching Experience in years *

Your answer

13. Which subject-specialized group would you like to participate in, if selected for the workshop? (choose only ONE) *

PHYSICS

CHEMISTRY

MATHEMATICS

LIFE SCIENCES

14. Why do you want to attend this workshop? (word limit: 500 words) *

Your answer

SUBMIT

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DEPARTMENT OF
SCIENCE & TECHNOLOGY



MHRD
Pandit Madan Mohan Malaviya National
Mission for Teachers and Training



IISER PUNE



Lakhimpur Girls'

College

Knowledge partners:



**BRITISH
COUNCIL**



**Newton-Bhabha
Fund**

**STEM Teacher Training Workshop on Research Based Pedagogical Tools (RBPTs),
3rd August – 5th August, 2017 at Lakhimpur Girls' College, Assam**

Workshop Schedule

Day 1: Thursday 3rd August 2017

Introduction of RBPT - Exploring our hopes about the workshop, identifying the characteristics we want to develop in our students and learning the fundamentals of the RBPT approach.

| Time | Activity | | | Form at | Venue | Trainer |
|------|--|------|---|------------|-----------------------------------|---------|
| 9:00 | Registration | | | — | In front of Teachers' Common Room | — |
| 9:30 | I N A U G U R A L S E S S I O N | 9:30 | Introduction & Felicitation to Guest | — | Seminar Hall-I | |
| | | 9:35 | Opening Remarks— <i>Welcome from Lakhimpur Girls' College by Dr. Surajit Bhuyan, Principal, Lakhimpur Girls' College</i> | | | |
| | | 9:40 | Formal Inauguration— <i>Remarks by Dr. Mukunda Rajbongshi, President, Assam Science Writers' Association & Rtd. Principal, Lakhimpur Girls' College</i> | | | |
| | | 9:50 | Remarks from IISER Pune -- <i>Welcome from IISER Pune representatives</i> | | | |
| | | 9:55 | Objectives of the Workshop -- | | | |

| Time | Activity | | Form at | Venue | Trainer |
|-------|---|--|---------------------------------|------------------------|-------------------------|
| | 5 | Remarks by Dr. Mridul Buragohain, Co-ordinator & lead trainer | | | |
| 10:00 | Research Based Pedagogy - “Research based pedagogy as an innovative training method” <i>---by Dr. Mridul Buragohain, Co-ordinator & lead trainer</i> | | Introductory talk | Seminar Hall-I | |
| 10:30 | Coffee/Tea | | | | |
| 11:00 | Introduction to RBPTs - background, concept of research, importance of student autonomy, what is RBPT, 5Rs, goals of RBPT, difference between RBPT and project. <i>--by Dr. Saitanya Bharatwaj, Trainer, Chemistry</i> | | Presentation | Seminar Hall-I | |
| 12.30 | Three in three Orient participants towards expectations and learning outcomes from the workshop <i>--by Ms. Bandana Gogoi , Trainer, Physics</i> | | | Seminar Hall-I | |
| 1:00 | Lunch | | | College Canteen | |
| 2.00 | Ideal student - Working In groups, prepare a poster to showcase the perfect student - their interests, attitudes, work habits and ambitions. What are we, as teachers, working towards? <i>--by Dr. Amar Jyoti Dutta, Trainer, Mathematics</i> | | Presentation and Group activity | Seminar Hall-I | |
| 3. 00 | Poster review followed by trainer led discussion Delegates review the posters of the perfect student to agree the key characteristics and suggest the things teachers can do to help this person develop - or restrict their development. What are the common issues? <i>--by Dr. Parag Nath, Trainer, Life Sciences</i> | | Trainer led discussion | Seminar Hall-I | All trainers contribute |
| 3:30 | Coffee/Tea | | | | |
| 4:00 | Crafting your own RBPT | | Show and | Seminar | All |

| Time | Activity | Form at | Venue | Trainer |
|------|---|--------------------------|-----------------------|----------------------------|
| | Explain structure of RBPT (Context, problem, activity, etc.), describe each element in detail, importance of context and how to set good context <i>--by Ms. Bandana Gogoi , Trainer, Physics</i> | tell | Hall-I | |
| 5.15 | Subject wise groups, topic selections and preparations for preparing your own RBPT | Group activity | Subject Rooms | All |
| 5:30 | Higher Education - Funding opportunities Participants will be given information about government initiatives such as DBT STAR College Scheme, DST-PURSE / INSPIRE that are aimed at improving the quality of undergraduate science education. The ultimate goal is to make teachers drivers for improving the quality of undergraduate science education. | Presentation by trainers | Seminar Hall-I | IISER Pune representatives |

Day 2: Friday 4th August 2017

Development of RBPT - This day will require delegates to develop RBPTs by choosing an appropriate topic from their subject.

| Time | Activity | Format | Venue | |
|-------|--|---|-----------------------|--|
| 9:00 | What are RBPTs (continued) Revise 5Rs & RBPT structure. Each trainer shows one example of RBPT (one per subject) - 15 min each <i>--by Ms. Bandana Gogoi , Trainer, Physics</i> <i>--by Dr. Parag Nath, Trainer, Life Sciences</i> <i>--by Dr. Saitanya Bharatwaj, Trainer, Chemistry</i> <i>--by Dr. Amar Jyoti Dutta, Trainer, Mathematics</i> | Presentation (RBPT on- Physics, Life Sciences, Chemistry & Mathematics) | Seminar Hall-I | |
| 10.30 | Elements of Enquiry - Panda Activity <i>--by Dr. Saitanya Bharatwaj, Trainer, Chemistry</i> | Presentation and | Seminar Hall-I | |

| Time | Activity | Format | Venue | |
|-------------|--|--|-----------------------|-----|
| | | activity | | |
| 11:00 | Coffee/Tea | | | |
| 11.30 | Preparing RBPTs Delegates work in groups to produce RBPTs suitable for their particular subjects and circumstances. Inputs – formation of groups, instructions, guide participants regarding selection of topics, and course correction | Group activity | Subject wise | |
| 1.00 | Lunch | | | |
| 2.00 | Open ended questions, concept of independent and dependent variables (AH) <i>--by Dr. Amar Jyoti Dutta, Trainer, Mathematics</i> | Presentati on and activity | Seminar Hall-I | |
| 3.00 | Preliminary review of Posters- trainers review posters and provide common feedback | Guided discussion by trainers | Seminar Hall-I | All |
| 3.30 | Coffee /Tea | | | |
| 4.00 | Nuts & Bolts - First Flying machine This inquiry looks at the mechanics of gliders flight to illustrate the key features of scientific research. Participants to prepare graphs/tables <i>--by Dr. Saitanya Bharatwaj, Trainer, Chemistry</i> | Group activity followed by discussion by trainer | Subject wise | |
| 5.00 – 5.15 | Closing Day 2 | | | |

Day 3: Saturday 5th August 2017

Refining the RBPT-The delegates require to complete and display their RBPTs and also list out the strategies for implementation of RBPTs at respective colleges.

| Time | Activity | Format | Venue | |
|-------|--|--|-----------------------|-----|
| 9:00 | Preparing RBPTs – Brief review of insights arising from Day One & Two. Participants refine RBPTs based on learnings of 1 st two days as a poster | Group activity One trainer for review, all for group activity | Subject wise | |
| 10.30 | Coffee /Tea | | | |
| 11.00 | Presentations of RBPT by each group (5 minute + 2 minute feedback) | Plenary | Seminar Hall-I | All |
| 1.00 | Lunch | | | |
| 2:00 | Summing up; Setting SMART targets | Talk by trainers | Seminar Hall-I | |
| 2.30 | RBPT implementation at colleges - Hurdles & Strategies After learning RBPT and its procedures, now list the blockers for implementation of RBPT and suggest enablers. Summarizing Strategies for implementation of RBPT <i>--by Dr. Parag Nath, Trainer, Life Sciences</i> | Group activity | Seminar Hall-I | |
| 3.30 | Closing and group photo | | Seminar Hall-I | |
| 4.00 | Coffee and disperse | | | |

Some Workshop Photographs



**STEM Teacher Training Workshop on Research Based Pedagogical Tools (RBPTs),
3rd August – 5th August, 2017 at Lakhimpur Girls' College, Assam**

Feed Back Form

Name:

Contact Number:

Email ID:

Name of Department, Institute/College:

Qualifications :

Subject of specialisation:

1. Where did you hear about this workshop(Tick the appropriate one)

IISER Pune website/email British council website/email From previous participants

Any other (please specify)

2. Your achievements from this workshop:

Was this workshop useful for your professional development? (Circle the appropriate one)

to a great extent to some extent partially not at all

Your comments:

3. Quality of workshop:

a. Delivery of the workshop (Tick the appropriate one)

| | Strongly Agree | Agree | Disagree | Strongly disagree |
|--|----------------|-------|----------|-------------------|
| The content of the workshop was appropriate | | | | |
| The trainers were responsive to people's needs | | | | |
| The workshop was well organised and planned | | | | |
| The workshop was inspirational | | | | |
| The content was relevant and useful | | | | |

b. Which session did you find most useful and why?

4. How would you rate the overall quality of the workshop? (Circle the appropriate one)

Excellent Good Poor Very poor

5. Suggestions for improvement:

6. Administration/Accommodation/Resources(Tick the appropriate one)

| | Excellent | Good | Average | Below average | Very poor |
|-------------------------|-----------|------|---------|---------------|-----------|
| Facilities at the venue | | | | | |
| Overall organisation | | | | | |

Please add comments:

7. In your opinion, what are the advantages of using RBPTs? The students will be able to:

1. Understand concepts better
2. Learn research methodology
3. Learn to work in groups
4. Memorise definitions
5. Any other:_____

8. Will you use RBPT in your classrooms following this workshop?:Yes / No

- a. What will you do?
- b. How will you know that students have understood the content?
- c. When do you plan to start doing the above?
- d. Do you expect to face any difficulties/problems in implementing this method in your classroom?
- e. Any other comments / suggestions / additions for future training:

Research Based Pedagogical Tools

Research Based Pedagogical Tools (RBPTs) is a sequence of teaching and learning activities designed to promote research activity by students. By designing and carrying out this research, students will improve both their research skills and relevant scientific domain knowledge. The RBPT approach is student-centered, inquiry-based and aims to develop both skills and domain knowledge. RBPTs are pedagogical tools, not research. They exist primarily to teach science and mathematics. RBPTs help students to refine their understanding to build powerful and predictive understanding. Moreover it helps students to refine their research skills (viz. cognitive, technical and personal). RBPTs are defined in terms of the '5R-Functions'- (viz. Recognise, Required, Refine, Reward and Report), this leaves the choice of resources to support these functions open. It does not matter how a teacher ensures that research is recognizable in the learning activities the students carry out- only that it is recognizable. Consequently, different RBPTs may look very

different but all must explicitly meet the 5R criteria. Thus, it can be difficult to specify particular structures in RBPT resource packages. The different components of a RBPT structure are-

- Context: what is the scientific and cultural situation of the topic?
- Problem: what is the identified need or issue?
- Activities: what will be the students do to address this issue?
- Output: what will be the students produce to showcase their work?
- Assessment: how will the teacher recognize success in their students both during the teaching and learning activities (formative assessment) and at the end (summative assessment)?
- Resources: what items are available to support the work in the classroom?

An RBPT package will contain a number of tasks which will lead student activities. When creating a task it is important to emphasise what the students are expected to do not what they are expected to know.

The RBPT project has been generously supported by British Council's Newton Bhabha Fund and Indian Institute of Science Education and Research (IISER), Pune.

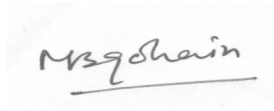
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Dr. Bhupen Chutia, the IQAC Coordinator delivered the vote of thanks to the Resource person and all the participants present.

The Workshop has received lots of positive feedback for which the Lakhimpur girls' College will always indebted to.

Certificates were also issued to all those who have submitted their feedback form.

Thank you

A handwritten signature in black ink, reading "Mr Buragohain", with a horizontal line underneath.

Dr. Mridul Buragohain
Workshop Coordinator