

# **Development of Research Based Pedagogical Tools (RBPTS) for Science Education**

**OE4BW Project**

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**Maharashtra**

**INDIA**

# Development of Research based pedagogical tools (RBPTS) for Science Education

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## ABOUT THE PROJECT

**Title:-** Development of Research based pedagogical tools (RBPTS) for Science Education

### Author:-

- ❖ Dr. Rohan V. Gavankar,  
Asst. Professor, VIVA College, Virar (West), India.

### Mentor:-

- ❖ Prof. Dr. Mohandas B. Menon,  
Former Deputy Vice Chancellor, Wawasan Open University, Malaysia.

### Hub coordinators:-

- ❖ Prof . Dr. Vasudha Kamat,  
Member , National Education Policy , India.  
Former Vice Chancellor, SNDT Women's University , Mumbai, India .  
Former Joint Director , CIET , NCERT, New Delhi, India.
- ❖ Dr. Jayashree Shinde,  
Director , Teaching Learning Centre,  
SNDT Women's University , Mumbai, India.

### Link to the course:-

<https://courses.mookit.co/course/rbpts>

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## Motivation for the work:-

- ❖ **Pedagogy** which will integrate research so as to attain student engagement.
- ❖ Design RBPTs so that these plans can be used by educators across globe for **free**.
- ❖ A teaching tool to keep **pace with changing environment of the learner** as they become natives of the digital world.

## Goals of the project:-

- ❖ Train teachers to develop **strategic plan/s based on research based pedagogical tools** so that they can infuse research in their day to day teaching learning process.
- ❖ Encourage **student engagement** in the teaching learning process by enabling them to construct knowledge by themselves.
- ❖ Related UNESCO Sustainable Development Goals (SDG) Goal/s:- **Ensure inclusive and quality education for all and promote lifelong learning.**

## Target audience:-

- ❖ A heterogeneous group comprising of teachers, researchers, curriculum developers and students.
- ❖ The Participants were from PAN India, Age group from 20 to 50, Some were students, Few were student-teachers enrolled for B.Ed. Programmes and Majority were Academicians.

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## Course Details:-

### Course specifications:-

**Length of the Course:** Three Weeks

**Schedule:** May 20, 2019 to June 8, 2019.

**Workload:** 3 to 4 hours per week

**Level:** Introductory

**Language:** English

**Prerequisites:** None

### Course Modules:-

Course was covered in three modules:-

Module 1: Introduction to RBPTS

Module 2: Flavour of RBPTS

Module 3: Making of RBPTS

(Content was divided in sub topics )

### Materials Used

- ❖ OER videos with CC licensed.
- ❖ Research papers with proper citations and weblinks

## Content Developed

- ❖ Text
- ❖ Documents in pdf.
- ❖ Screen –casts
- ❖ [Videos](#)
- ❖ Conversation video
- ❖ Role play –video

- ❖ Quizzes
- ❖ Assignments
- ❖ Surveys
- ❖ Animated videos
- ❖ Powerpoint presentations with voice over.

### Free Course pre survey

“ [Three in Three](#)” - platform – Survey Monkey

[Final feedback and suggestions](#) from the participants – Google forms.

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## Course Design:-

It was phased in three phases.

### **Phase 1 – Planning and finalization**

- ❖ Brainstorming discussions were made via Skype, email and telephonic conversation with mentor and hub-coordinators
- ❖ The final number of modules were narrowed to 3 modules - 3 weeks - 12 hours.

### **Phase 2 – Structure and Detailing**

- ❖ Well –spaced with keeping in mind the objectives of the course
- ❖ Gradual progression so as to give the feel of constructivism.
- ❖ Time investment was consistent across three modules.

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## Phase 3 – Exploration of designs

- ❖ **Learning platform- Open and free** - Simple registration and enrollment process.
- ❖ **Content coverage** - Each step of the design was planned using a format about how the content will be covered. Example to know the background of the learner a pre-survey form was designed along with their introduction.
- ❖ **Know well or revise-** The Quiz was randomized with many reattempts for giving participants a chance to go through the content again and again.
- ❖ **Break the monotony and mind the duration** - Videos were developed using screen-cast, shooting, ppt with audio and conversation based to break the viewers monotony, The videos were kept in between 5 to 9 minutes.
- ❖ **Light and activity based** – emphasis was laid on trying ,doing, researching and more important engagement with enjoyment.

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KEY NOTE VIDEO PART 1 - INTRODUCTION TO RBPTS

Submitted by rahangswankar@... on Tue, 05/21/2019 - 20:28

What's in the Name

RBPTS - Research Based Pedagogical tools

Problem based learning

Learning by doing

Project based learning

Inquiry based learning

Length of the Video: 6:53

Topic: KEY NOTE VIDEO

Title	Visits	Downloads	Calls	Clicks	Views
1 21st Century Learner	31	0	0	28	21
2 The Process of science	26	0	0	23	17
3 Curtain raiser- Meet your Instructor	25	0	0	24	23
4 KEY NOTE VIDEO PART 3- RESEARCH TEACHING NEXUS	22	0	0	21	17
5 KEY NOTE VIDEO PART 2 - 5 R MODEL	22	0	0	21	15
6 KEY NOTE VIDEO PART 1 - INTRODUCTION TO RBPTS	22	0	0	19	15
7 SOCRATIC METHOD OF QUESTIONING- A ROLEPLAY	17	0	0	17	15
8 ASSIGNMENT 2 - WILL IT FLY?	18	0	0	18	18
9 HOW TO DESIGN A GOOD RESEARCH PROBLEM?	16	0	0	16	15
10 HOW TO DESIGN A GOOD RESEARCH PROBLEM? Video 2	16	0	0	16	14
11 OUTCOMES OF PAPER PLANE ACTIVITY	17	0	0	16	13
12 FINAL MODULE- CLUES IN MAKING OF RBPTS-1	19	0	0	18	16
13 FINAL MODULE- CLUES IN MAKING OF RBPTS- 2	17	0	0	16	15

RBPTS

Summary Statistics Timeline Forums Network

48 Registered Students

36 Active Students

20 Active Students in last 7 days

13 Forum Posts

30 Comments Posted

Daily Student Engagement

Chart Type: Area, Line

7 11929 DR RITU BALA ritu\_bala11@yahoo.com 36-40 Others Female Individual

Country Haryana

Visits 16

Views 16

RBPTS- How well I know this; Quiz 1 90

8 11937 ABHILASH T abhilashh217@gmail.com 21-25 Post Graduate Male Individual

Country Uttar Pradesh

Visits 16

Views 16

RBPTS- How well I know this; Quiz 1 100

10 11956 ALKA MUDDGAL alkamuddgal@yahoo.com 46-50 Doctorate Female Academia

11 11959 DEEPAK CHAUDHARY dpak11c@gmail.com 21-25 Post Graduate Male Academia

Country Maharashtra

Visits 16



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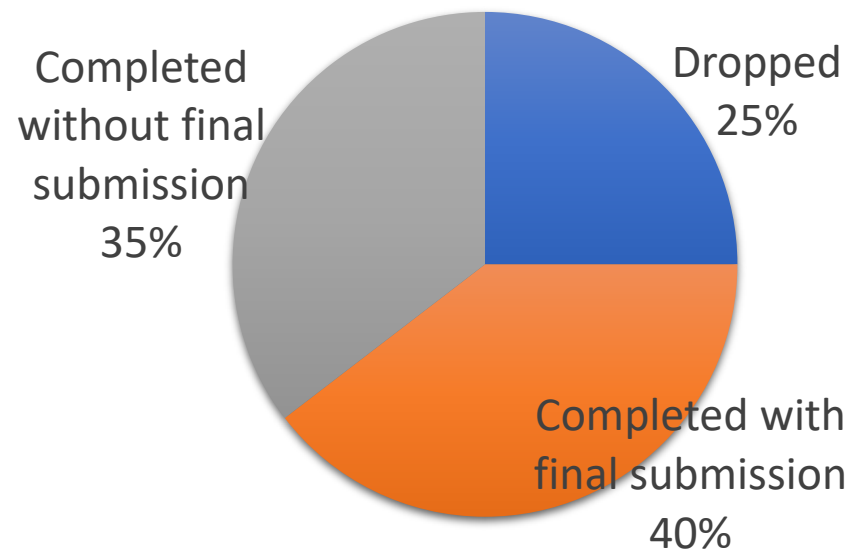
## Course Statistics

Total Enrolled = 48

Dropped = 12

Completed with final submission = 19

Completed without final submission = 17



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## Project Development

### Starting point :-

- ❖ The incentive to contribute in the OE4BW project was the main push behind this work.
- ❖ The feel of giving back about what I learned to others so that knowledge disseminates.

### Challenges:-

- ❖ Finding a mentor.
- ❖ Offering the course online.
- ❖ Selection of free portal – both for launching and for users.
- ❖ Time constraints.
- ❖ Learners are mostly teachers or would be teachers.

### Lesson Learnt:-

- ❖ Creation of varied OER and integration of activities sustains the interest of the learners.

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## OE4BW Project

- ❖ Created a zeal to create something which otherwise trying would have also been miles away.
- ❖ True to its name really creating a better world by giving opportunities.

## Mentor – Prof. Dr. Mohandas B. Menon

- ❖ a significant role in designing the course,
- ❖ Refining and giving it a more professional look.
- ❖ Emergence of a well defined course due to timely guidance.
- ❖ A true philosopher, guide, humble and knowledgeable who knows only to give...

## Hub coordinators – Prof. Dr. Vasudha Kamat and Dr. Jayashree Shinde

- ❖ The efforts taken by Kamat madam and Jayashree madam to find a right mentor for me was very touching.
- ❖ Small suggestions, inputs and guidance by them makes you believe that yes you can do it.
- ❖ Motivational , inspirational and Role model.

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## Future plans

- ❖ The project was designed only at an introductory level so taking it to next level
- ❖ The feedback from participants suggested the course should be conducted 5 to 6 weeks as it will train them more.
- ❖ Develop the course in a blended mode .

## Suggestions

- ❖ Preliminary Online induction from experts before developing a course
- ❖ Common interaction platform so that more engagement of the developers can take place.



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## Course Details:-

### Module 1 :- Introduction to RBPTS

Scheduled date: 20<sup>th</sup> May 2019 to 25<sup>th</sup> May 2019

- 1.1 Process of Science
- 1.2 21<sup>st</sup> Century learner
- 1.3 Introduction to RBPTS
- 1.4 5 –R model
- 1.5 Research teaching nexus

#### ❖ Assignment –

- 1. Complete the thread... (Conversational dialogue writing)

#### ❖ Quiz

### Module 2 :- Flavour of RBPTS

Scheduled date: 27<sup>th</sup> May 2019 to 2<sup>nd</sup> June 2019

#### ❖ Assignment –

- 1. Will it Fly? (paper plane activity)
- 2.1 Outcomes of paper plane activity.
- 2.2 How to design a good research problem?
- 2.3 Socratic method of questioning – Role play way.

### Module 3 :- Making of RBPTS

Scheduled date: 3<sup>rd</sup> June 2019 to 8<sup>th</sup> June 2019

- 1.1 Final cues in making of RBPTS - RG in conversation with Basil D'Mello

#### ❖ Assignment –

- 1. RBPTS strategic plan.

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Development of research based pedagogical tools (RBPTS) for science education

Developed as a part of UNESCO OPEN EDUCATION FOR BETTER WORLD Mentoring Program

**DEVELOPMENT OF RESEARCH BASED PEDAGOGICAL TOOLS (RBPTS) FOR SCIENCE EDUCATION**

TEACHER'S NOTE

STUDENTS PLAN

LAB ACTIVITY

BIODIESEL

ROAD LESS TRAVELLY

ADJUSTMENT

20th May 2019 to 8th June 2019

View Edit

Access Course

Manage Course

Manage Team

Course Description

Learner of 21st century is exposed to the ocean of information at her/his fingertips. A single query posed on a Google search engine gives an array of output hits. To maintain pace with the present generation of learners who...

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## Course Implementation

The course was offered on mookIT platform hosted by IIT Kanpur ,

<https://courses.mookit.co/course/rbpts>

The main features of the online platform explored by the user interface were:-

The screenshot shows the course page on the mookIT platform. The browser address bar displays <https://courses.mookit.co/rbpts/#/home>. The page title is "Development of research based pedagogical tools (RBPTS) for ..." and it indicates "Users Online : 1".

The left sidebar contains navigation options: Course Home, Announcements, Resources, Forums, Hangout, My Profile, Logout, and Help. Below these are language selection options (English) and the mookIT logo.

The main content area displays a list of video modules:

Module Name	Duration
FINAL MODULE- CUES IN MAKING OF RBPTS-1	5:23
FINAL MODULE- CUES IN MAKING OF RBPTS -2	5:04
FINAL MODULE- CUES IN MAKING OF RBPTS-3	5:29
FINAL MODULE- CUES IN MAKING OF RBPTS-4	2:30
FINAL MODULE- CUES IN MAKING OF RBPTS-5	6:54

Below the video list, there is a red banner for "RBPTS STRATEGIC PLAN" with a due date of "9/6/2019 18:29". Underneath, there are three green banners representing dates: "20th May 2019 - 22nd May 2019", "20th May2019", and "23rd May 2019 to 25th May 2019". At the bottom, there is a section for "KEY NOTE VIDEO".

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## Course Videos on YouTube



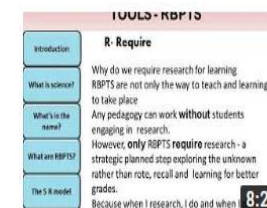
Introduction



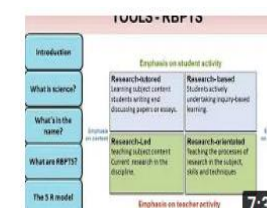
Meet your mentor



Presentation



KEY NOTE PART 2 1



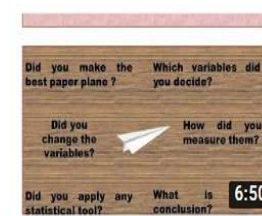
Key note 3 final



Skit



Paper plane activity- RBPTS



Outcomes of paper planes



Interview Part 1 -RG in Conversation with Prof. Basil



RG in Conversation with Prof. Basil - 2



RG in conversation with Prof. Basil-4



RG in conversation with Prof Basil- 5



Promotion of RBPTS

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