

Best Practices 2014-15

Best practice-1: Innovative teaching method

1. Title of the Practice:

The benefits of understanding and learning concepts at their own pace.

2. Objectives of the Practice:

- Understanding concepts of the subject at their own pace
- Inculcating the habit of reading on one's own
- Asking questions relevant to the subject to enhance knowledge
- Applicability of a concept
- Enhancing writing ability

3. The context that required the initiation of the practice:

Analyzing the results and performances of the students in the internal exams of Semester I, it was observed that the class could be segregated into two groups based on their potential to grasp and understand concepts. This was done to ensure that the motivation level of each group be maintained by ensuring that they were given assignments that could hold their interest and attention, and also do justice to their potential. This also ensured that the challenges a group faced were almost of the same level and hence none of the students felt alienated, thereby, ensuring that they do not lose interest, motivation and focus. The questions asked were such that they could answer them only if they had read the subject. Moreover, they had to read and answer the questions in the class. This minimized the practice of copying from books and from others. They could answer only if they had read.

4. The Practice:

Batch I: Learn at your own pace

Step 1: The students are given either reading materials from textbooks or are given links for reading materials

Step 2: They are given a time period for reading.

Step 3: They are given three attempts to answer a set of questions on their own in the classroom. The questions are such that they can be answered if only the concepts are understood.

Batch II: Research proposal

Step 1: The students were divided into small groups for group discussions on select research papers.

Step 2: The research paper is thoroughly discussed and alternative experiments are designed to reach to the same expected result with the objective to enable students to think out of the box.

Step 3: The students have to give their own research proposals

Best Practice 2

Title of the Practice: The Advanced B. Sc (Physics) Programme

Objectives of the Practice: Amongst the students who opt for doing a Bachelor's in Science there are a few who are greatly interested in the subject and are motivated to challenge themselves further if given an opportunity. The aim of the Advanced B.Sc

(Physics) Programme is to provide such students with an enhanced B.Sc. curriculum that can be challenging, interesting and inspiring

The context that required the initiation of the practice: The Advanced B. Sc. (Physics) Programme was started by the joint efforts of Gujarat Science Academy (GSA) and Vikram A. Sarabhai Community Science Centre (VASCSC), Ahmedabad in 2003 under the guidance of experts from Institute for Plasma Research (IPR), Physical Research Laboratory (PRL), Indian Space Research Organisation (ISRO), etc. The original programme was designed as a 3-year programme for students to run concurrently with the regular B.Sc. programme. Since 2008 the programme has been conducted as a residential programme in the summer for 3 weeks duration. This has allowed students from all over the state to participate in the programme. Since 2012 The Advanced B.Sc. (Physics) Programme is been conducted at St. Xavier's College campus with very active guidance and supervision of the department of Physics of St. Xavier's College. The programme is financially supported by Gujarat Council on Science and Technology (GUJCOST), IPR and PRL.

The Practice: The Advanced B.Sc. (Physics) programme is an approximately 3 week summer residential programme for motivated B. Sc. students. The course consists of lectures in Electromagnetism, Quantum Mechanics, Mathematical Physics and laboratory sessions for performing experiments. The lectures are designed to be interactive and are followed by tutorials in which problems are discussed.

The topics covered in the programme are related to those in the regular college curriculum but are dealt with in greater depth and with an emphasis on problem solving. The problems are selected such that they probe the students' understanding of the subject.

The lectures are taught by faculty from PRL, IPR and ISRO. This allows students to come in contact with scientists who are actively engaged in research at an early stage in their education. In addition, visits are arranged to research institutions such as IPR, PRL and ISRO so as to introduce the students to research centres in India. The programme also includes a session on career opportunities in Physics.

Successful students are provided a certificate of completion at the end of the programme. Participants are also provided scientific books to enhance their understanding of science.

5. Obstacles faced if any and strategies adopted to overcome them: Selecting around 30 really motivated and capable students, giving fair chance to students from all colleges is a challenging task. We have adopted a selection procedure consist of selection test, academic record, Essay writing. Second Obstacle is medium of instruction. Students from vernacular as well as English medium participate in the programme. We choose Faculty and Tutor pair such that medium of instruction does not face problem.

6. Impact of the practice: Several past students of the programme have performed well after participating in the programme. Some students have joined M.Sc. and PhD programmes at prestigious institutions in India and abroad such as IIT, IISER, Pune University, State University of New York at Stony Brook, University of Kwa-Zulu Natal, S. Africa. Some others have joined scientific organizations such as IPR, PRL, Gujarat Science City and VASCSC as employees, science educators or project associates.

7. Resources required: The programme is funded by Gujarat Council on Science and Technology (GUJCOST), Institute for Plasma Research (IPR) and Physical Research Laboratory (PRL).