

7.2 Best Practices

1. Fostering Undergraduate Research Culture

Aim:

To promote and develop young scholars with research attitude and skills by integrating research as curriculum projects or voluntary extended hours projects.

Objectives:

1. Students to understand the importance of research and get motivated to select research-oriented career
2. To promote and develop research scholarly traits in students at an early stage
3. To apply the principles they learned through theoretical courses and laboratory practices to solve problems by experiential learning
4. To inculcate the culture of innovation and invention in the young scholars

Context:

Indian Education system has been producing students to reproduce the text book content in the examination. The lack of critical thinking and ability to solve real life problems extends all the way upto tertiary education. However, attempt is being made to transform the century old text book - savvy system to competency based education. Goal of introduction of research at early stage is to enable the learners to utilize the education as a tool to tackle real world challenges so as to achieve critical and independent thinking in identifying the cause of the problem and find a proper solution. Traits of scholarly problem solving approach to meet future challenges

New strategies are needed to restructure the UG education that can enhance the students ability to participate in research activities as either part of the curriculum or elective extended activity. UG research will not only enhance the quality of students but also help India generate relevant scholarly research human resource to contribute to the knowledge economy of the country. In addition, it will also address the issue of substandard research output and the demand of the large number of innovation and invention oriented researchers needed to enhance the knowledge economy. Catching them young and giving them systematic research training at the undergraduate level, can make them interested and motivated and more inclined to take up research-intensive academic programmes and careers in the future. Undergraduate research can also help in the transformation of conventional classroom education to indirect as well as experiential learning.

The Practice:

Curriculum based research projects

Projects are carried at the final semester (B.Sc 3 year and 3+1 year programme). However, students select the topic for research of their interest in the previous semester. The students are given training on publications and patent search. They identify faculty members with expertise as supervisor in the area of topic selected. The project proposal is presented in front of full department committee giving the details of literature review, gap in literature, scope of the work, hypothesis, methodology, data analysis and expected outcome.

The department committee reviews again and let the students initiate the research projects. The students are trained in writing the proposal for clearance for Institutional Human Ethics Committee (IHEC). The supervisor coordinates and monitors the project.

Non-Curriculum based UG Projects

Under graduate students pursuing for MBBS course are encouraged to apply ICMR STS projects. Students are given orientation on the avenues available for research. The students are trained in drafting application to ICMR STS. The projects are chosen based on the research interest of the students. The students who miss the ICMR-STS are encouraged to do projects with university support. Similarly nursing undergraduate students are encouraged to take projects on preventive aspects of health care for the benefit of society.

The students in this manner learn the methodology of writing a proposal, conducting the research, analyzing and reporting the research data. They also get exposure in writing manuscripts for publishing in the peer reviewed journals.

Obstacles faced if any and strategies adopted to overcome them:

1. The main obstacle is that project period is very short. Hence it limits the projects outcome: However, this obstacle is generally removed by providing extended lab facility outside the stipulated hours.
2. Number of available faculty members to guide interdisciplinary projects: This difficulty is addressed by having faculty members from other departments as supervisors, so for interdisciplinary projects.
3. Although the under graduate projects have resulted in publications and patents are filed, the conversion ratio is not significant. The obstacle is, after submission of the thesis students either opt for placement or go for higher education: This obstacle is solved by letting the students work during summer holidays after submission of dissertation.

4. Another obstacle is consumables required: This obstacle is solved by getting additional budget from the university to support UG research. A time schedule based operation on higher end instrumentation solves the problem of wait-listing the users.

Evidence of Success:

1. Even students with lower academic achievements have shown high interest in research projects.
2. Resulted in publications in scopus indexed journals.
3. Resulted in filing patents.
4. Resulted in conference participation and awards

Resources: Extended hours, work by faculty, Lab facilities for extended hours, Budget for consumables