



Report on student centric methods, such as experiential learning, participative learning and problem-solving methodologies are used for enhancing learning experiences

Experiential learning is a dynamic educational approach that bridges theoretical knowledge with practical applications for the students of Biotechnology. In the field of biotechnology, hands-on learning, research-based projects, and industry exposure are crucial for developing problem-solving skills. The Department of Biotechnology at St. Edmund's College, Shillong, actively integrates experiential learning with innovative problem-solving methodologies. By emphasizing hands-on research, industry collaborations, and interdisciplinary approaches, students are equipped with the skills necessary for real-world biotechnological challenges. This holistic approach fosters scientific curiosity, enhances employability, and contributes to the advancement of biotechnology.

This report outlines the significance of experiential learning and various problem-solving methodologies employed in the Department of Biotechnology at St. Edmund's College, Shillong.

A. Experiential Learning Approaches

1. Laboratory-Based Learning

- Students engage in practical experiments in microbiology, molecular biology, bioinformatics, and bioprocess engineering.
- The practicals are having defined SOP's and focused on the DO BY YOURSELF with proper guidance from teachers.
- Hands-on exposure to instrumentation such as spectrophotometry, chromatography, Gas Chromatography and PCR.

2. Project-Based Learning (PBL)

- Students undertake research projects in bioremediation, bioenergy, and environmental monitoring, plant biotechnology in context to the local needs. One such successful project was the advent of paper fertilizer of the institute.
- Collaboration with research scholars and faculty to develop innovative solutions.
- Encouragement of hypothesis-driven inquiry and experimental validation.



3. Industry and Research Collaborations

- Internships and collaborations with biotechnology firms and research institutes. The department send students every year to partner institutes for 15 days internship
- Exposure to industrial-scale biotechnological applications such as fermentation, biofertilizer production, and waste management.
- Participation in national and international conferences and workshops.

4. Field-Based Learning

- Field visits to environmental sites, biogas plants, and aquaculture farms, research laboratories
- Real-world case studies on biostatistics analysis

B. Problem-Solving Methodologies

1. Design Thinking Approach

- Understanding the problem through observation and data collection.
- Ideation and prototyping of biotechnological solutions.
- Iterative testing and refining of methods in laboratory settings.

2. Critical Thinking and Analytical Skills

- Encouraging students to analyze scientific literature for data interpretation.
- Application of statistical and computational tools for data-driven decision-making.
- Case study analysis to develop logical reasoning and hypothesis testing.

3. Interdisciplinary Collaboration

- Integration of biotechnology with chemistry, environmental science, and computational biology.
- Joint research projects with departments of Zoology
- Exposure to multi-disciplinary problem-solving approaches.