Faculty Innovations in Teaching and Learning

The **Electrical** Engineering Department adopted the following strategies to make the effectiveness of teaching methods at the highest level.
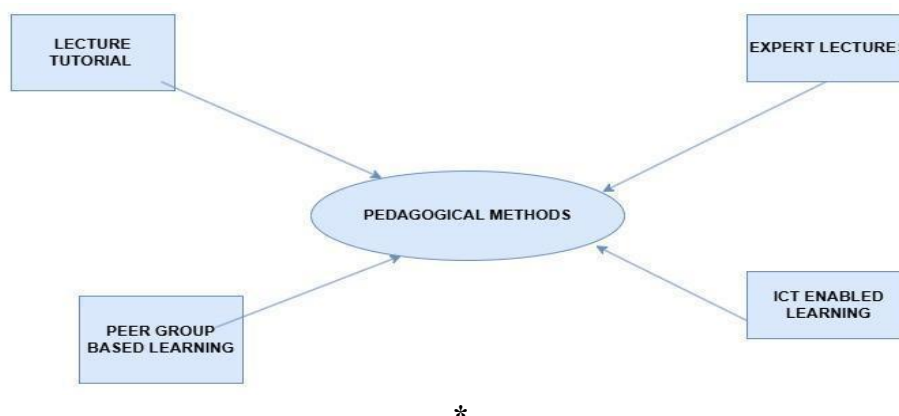

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Fig. 5.5 Pedagogical Initiatives of the Department

1. Subject Allotment and Preparation

Subjects are allotted to faculty members based on their expertise and area of interest. Each faculty prepares a comprehensive lecture plan prior to the commencement of classes, along with Course Outcomes (COs), Program Outcomes (POs) mapping, and a detailed Course Information Sheet (CIS). Lecture notes (both hard and soft copies) are also prepared in advance to ensure structured and systematic delivery. Common assignments are given to both batch students after discussing among the respective faculty, course coordinator, and module coordinator.

> **Interactive Lectures**: Faculty adopt a blend of innovative pedagogical approaches in addition to traditional chalk-and-talk methods. These include: PPT-enabled lectures and video demonstrations for better conceptual clarity. The lectures in the form of presentations or group discussions improve the knowledge and communication level of students in the respective subjects. For some of the core subjects, lessons are described to the students with the help of the lab facilities of the corresponding subjects.

2. Outcome-Based Education (OBE) Orientation

Lessons are delivered strictly in line with the lecture plan, with continuous monitoring of student progress. Assessment tools such as quizzes, assignments, presentations, and group discussions are employed to evaluate participation and learning achievement as per OBE guidelines.

3. **Technology-Enabled Learning**

   a. **ICT-enabled Classes:** In order to handle ICT-enabled classes and to improve operational efficiency, enhance communication, and provide a better learning experience for students. A campus management software 'ETLAB' is available to all faculties for the subject they handle in each semester from 2018 onwards. The ETLAB has provisions for conducting quizzes, exams, and sharing course materials in the form of documents and videos. The CMS helps in keeping a continuous record of student academics.

   b. **MOODLE**: In addition to ETLAB, faculties also use MOODLE for conducting exams and providing feedback. The platform provides auto-evaluation and peer-evaluation of answers.

   c. **Plagiarism detecting software**: Each faculty in the Department has access to plagiarism detecting software, TURNITIN. This helps faculties as well as students in generating plagiarism reports of technical reports.

   d. **MOOC Courses**: Faculty members actively participate in **MOOCs and NPTEL courses** in emerging areas such as Artificial Intelligence, IoT, Renewable Energy, and Advanced Power Systems. This continuous upskilling enables them to integrate the latest knowledge and industry practices into their teaching.

   The **technologies and facilities** available and used by the faculty for effective teaching are as follows.

   • Educational Videos (NPTEL)
   • Google Classroom
   • Knimbus Digital Library
   • Flipped classroom
   • Online study archive
   Apart from the use of modern electronic gadgets mentioned above as teaching aids, effective library support through e-journals (Science Direct, IEEE) are made available to staff and students.

4. **Project-Based Learning**:

Project-Based Learning (PBL) is an instructional approach that emphasizes active student engagement through the exploration of real-world challenges and problems. Instead of traditional, lecture-based learning, PBL encourages students to work on meaningful projects over an extended period, promoting deeper understanding and skill development. Through collaboration, research, critical thinking, and creativity, students take ownership of their learning by investigating complex questions and producing tangible outcomes. These projects often culminate in a public presentation, allowing students to share their work with an audience beyond the classroom. PBL not only enhances academic knowledge but also builds essential life skills such as communication, problem-solving, and teamwork, making learning more relevant and impactful. Development activities of the following student projects have the potential to be converted into products. They can contribute significantly to easing the hardships of day-to-day life.