

7.2 Best Practices

7.2.1 Describe at least two institutional best practices

1. Title of the Practice: Academic Audit and Inspection

Objectives:

The purpose of an academic audit is to encourage Institute to evaluate the quality of ‘Teaching-Learning processes’.

To standardize the teaching learning process thus to ensure quality of technical education throughout the system.

To ensure academic accountability of every stakeholder, i.e. students, teachers, institute and University.

The Academic Audit is a peer review process involving self-study and then an audit visit by an expert from outside the Institution. The process emphasizes on self-improvement rather than mere compliance with predetermined standards.

The Context

The Institute should have appropriate strategic and operational planning related to student performance, achievements and teaching quality. PowerPoint presentation, the Course files and various reports made by the faculty members are the best way to understand and evaluate their contribution to the academic activity carried out by them. The Institute must provide teaching and learning facilities as per the needs.

The Practice

Academic inspection is conducted in every semester or academic year. It is mainly about the quality of teaching and learning methods followed by the teachers for the course which they teach. After the successful completion of theory and laboratory session, faculty members prepare record of their course. Faculty members are preparing a course file for the course they are teaching. Course file includes record of various documents including objectives and outcomes of the course, Course Teaching Plan, Assignments, Practice Papers with Solutions, Class Test Solution and Result Analysis, Attendance Records of students, Course Notes prepared by faculty.

The Institute/Department identify an academic experts for the Academic Audit of the Institute/Department. Academic experts from National Institutes, such as IIT, NIT or other Institutes who have made mark in the field of education and research are called as an expert. An industry expert may be also included in the team for his perspective on quality of students.

Using the input from the stake holders the Auditors shall prepare a report with the help of the Director of the Institute by

1. Noting areas for improvement
2. Evaluating department’s approach to educational quality practices
3. Highlighting examples of exemplary practice(s)

Evidence of Success

The academic audit helped the faculties for smooth conduction of teaching learning process. Faculties improved their teaching skills by adhering to the guidelines given by institute as well as suggestions given by the academic experts. Laboratory reports are also modified based on the audit report.

Knowledge delivery to students become well planned and students' activities get stream lined. Faculties seek out good practices and adopt the best to their own conditions.

Problems Encountered and Resources Required

Identification and availability of right type of Academic Expert.

Define quality in terms of outcomes.

Finding the best approach in the learning assessment.

Difficulty in arranging Expert visit due to Covid-19 Pandemic situation.

2. Title of the Practice: Project Based Learning for Advanced Learners

Objectives:

To develop students' deep content knowledge as well as critical thinking, creativity and communication skills in the context of doing an authentic, meaningful project.

To motivate students for participation in different competitions like SAE Aero Design Challenge, Smart India Hackathon, Avishkar, etc. In addition, it also provides platform to the students to implement their innovative ideas.

To make students Industry-Ready.

The Context

Project Based Learning (PBL) prepares students for academic, personal, and career success, and readies students to rise to the challenges in real life. Thus PBL is becoming widely used in learning. However, it is not just from "doing a project" but engaging in rigorous Project Based Learning.

While adhering to the curriculum of the University of Mumbai, implementing Project Based Learning across all the students is a challenge as students get busy with the curriculum aspects. Hence this activity has been restricted to Advance Learners (AL) and also some of the exceptional students having aptitude for PBL who do not qualify under AL.

As one of the pre-semester activities, faculty members prepare a list of projects with references and announce the same through Whtsapp groups and Google Class Rooms. This helps students to select the topic amongst the topics listed or the topic of their own choice after approval.

The Practice

The advanced learners are identified based on their track record of academics, grasping ability, programming / design skills and their aptitude for working projects. Students make groups of 3-4 students either from the same discipline or across disciplines depending on the nature of the project. Based on the list of projects offered by faculty, they can choose the topic or they can also work on their own innovative idea. Topics of these projects are such that students get an

opportunity to work on complex engineering problems guided by domain experts, alumni, industry experts and faculty.

Having chosen the topic, students are trained for literature survey utilizing Library, Internet, NPTEL and other video lectures etc. Based on this, the students prepare a report and present to the faculty within a fortnight defining the scope of work for their chosen project. Wherever possible students also take guidance from Alumni, Industry Experts, Institutes like IIT, ICT and BARC etc.

Under this activity, the students had developed many real time projects in the area of IoT, Process Simulation, Network Security, Embedded systems, etc. Students also make PPT presentation as per the schedule when Industry experts are present. The best projects are ranked and Certificate of Merit is given to them.

Some of the project titles are:

Design and Simulation of CSTR using Virtual Lab, Low cost 150 Watt Amplifier, Digital Photostat Centre, Online Software Modelling for Continuous Assessment Process, Speech Recognition System, IoT based Smart Mirror, Smart Plug, Rain Water Detector System, DeepFake detection using CNN, Smart Attendance (Mobile App), MGM Hospital App, etc,

Evidence of Success

This exposure to Project Based Learning is useful for the students to participate in different competitions.

(1) SAE Aero Design Challenge (49th Rank in 2019 and 30th Rank in 2020),

(2) SUPRA SAEINDIA Student Formula (Rank 36, 60, 30 and 60 from 2015 to 2018 respectively),

(3) Smart India Hackathon' (Five teams participated in 2020, Four teams participated in 2019, Three teams participated in 2018, Two teams participated in 2017. In 2018, Team 'BugSquashers' won the first runner up prize of Rs.75,000/- at BHU, Varanasi out of 48 teams shortlisted for that theme from all over India),

(4) 'Avishkar Research Convention organized by UoM (Four groups participated in 13th district level competition. One of them secured 1st Rank under UG level for a project entitled "Design and Development of Drone for Crop Health and Soil Quality Monitoring" in 2019),

(5) In 'Technicia' organized by Amity University, Mumbai from 23rd- 24th Jan 2020, Mr. Syed Fayzan (SE Chem. Engg. student) secured

- 1st position in Technical debate
- 1st position in Technical Quiz debate
- 2nd position in Junkyard
- He has also secured 3rd position in G. K. Quiz competition, 5th MGM Olymics at JNEC, MGM, Aurangabad (3rd- 5th Dec 2019)
- 2nd position in COVID-19 LOCKDOWN BUZZER QUIZ CONTEST conducted by IEEE Bombay Section

(6) Mind Mine Data team (Two students from IT Department) participated in Gov-TechThon 2020, a virtual hackathon organized by IEEE in collaboration with National Informatics Centre, MeitY, GoI and Oracle from 30th October 2020 to 1st November 2020

The students made our Institute proud by their success and prizes won by them.

Problems Encountered and Resources Required

Industry involvement for these projects is yet a challenge. College is trying to tie-up with some industries which can provide resources, if required.

Although advanced learners are identified based on their academic track record, their grasping power, programming skills etc., some of them do not have aptitude for taking up on projects.