Best Practices

1. Title of the Practice:

Innovations and best practices in Promotion of Research

1. Goal : Research is a creative and essential activity for the Technical Institution. This enhance the creation of Knowledge which supports one of the major academic missions of the Institution. The SJM Institute of Technology (SJMIT) is exploring and practicing innovations in generation of knowledge by promoting research activities on the campus. One of the missions of the college is conduction of applied and quality research in the campus. In order to promote the research on the campus, SJMIT planned a policy of ' Innovation & Research' activities which delineates research mission, measures to be taken to ensure research excellence, innovations to be adopted to become the leader in advancing the frontiers of technical research. Thrust areas of focus have been identified in faculties of Mechanical Engineering, Electrical & Electronics Engineering,Civil Engineering, Computer science & Engineering, Mathematics, Physical Sciences and other faculties. The document predicts the strategies to be followed to accomplish the research goals and commitments of faculty members.

2. The Context

The basic prerequisites for achieving high quality in academic research, as identified by the Institution, are as follows:

1. Ensure Research Excellence
2. Focus on regional and national based issues
3. Preference for product oriented research
4. Availability of good infrastructural and advanced scientific instrumentation facilities.

The innovations and practices being followed to meet the challenges of the rapid advances in Technical and Scientific research are detailed below.

- SJMIT identified the thrust areas of research in various disciplines keeping in view the academic expertise of the faculty, natural resources of the region, demands of the country, resources and facilities available.
- The Institute has faculty members specialized in diverse fields and are actively involved in research.
- The faculty are encouraged to attend conferences organized by Professional Societies, Institutions, workshops on science and technology, individual training in National laboratories and premier research organizations.
- The Institute provides full partial support to faculty for attending conferences in India.
- Several faculty members are registered in reputed universities for their doctoral studies on part time basis. The Institute provides academic leave for the same research work.
- The Institute encourages teachers to submit major research projects proposals to National and International public funding agencies.
- SJMIT has a reputation for excellence in technical and scientific research and innovation. The university recognised R&D centre which was established in the year 2012.

3. The Practice:

The following practices are implemented for promoting Research activities in the institute :

Faculty Excellence :

The SJMIT has a Doctoral Committee to address and monitor the issues related to the research activities. Mechanical Engineering department has been recognized as Research Centre by Visvesvaraya Technological University (VTU) and this centre is actively engaged in meaningful research activities. The research grants have been increased steadily with more faculty members participating in R&D activity and the total external funding has crossed Rs. 50 Lakhs at present which results in establishment of R&D facilities.

Provision of part Doctoral degree programme :

In the Institute ,the faculties and research scholars have registered for Ph.D programme on part time basis. Senior faculty members of various department are guiding for Ph.D Scholars. To inspire faculty and students, several workshops, Faculty Development Programmes and Training Programs were conducted. Research projects were taken up with a different funding agencies for students. **T**he students are also encouraged to carry out the project work at R&D centre. The research projects funded by agencies like KSCST and VGST ,VTU etc.,.

Financial support: The faculty have presented and published their research work in national and international conferences and journals. The institute provides partial/complete support to faculty members for attending Seminars and Conferences at National and International level.

Development of MoUs with National laboratories:

In SJMIT, the Industry Institution interface is created by signing up of Memorandum of Understanding (MoU) with several partners. The UG, PG and Research scholars participate in these activities at different levels. A bio-diesel plant is established in Mechanical Engineering department sponsored by Karnataka State Bio Energy Development Board(KSBDB), one of the government organizations. Bio Diesel awareness Programmes, Bio-Diesel Production, Training and Research are conducted under this project.

Development of infrastructural and advanced Scientific facilities

The Institution has laid down clear strategies for development and growth of infrastructural facilities in the campus. The Institute considers liberally allocation of special budget for development of infrastructural facilities needed for research without any specified limit on budget allocation.

Information resources:

The campus has the browsing centre for the faculties and students at Library also. The institution provides facility to access research journal papers, e-journals like IEEE, Springer, Science direct, Elsevier, etc.

The entire library is automated using computer systems. The Digital Library is provided with NewgenLib 3.0 version software with 8.0 TB storage. The institute library has a membership of VTU consortium and provides web access to books, e-journals, Periodicals, theses and dissertations. Transactions are automated by using bar code reader

4.Evidence of Success:

The best practices followed resulted in:

- Increase in the number of faculty with (Doctoral degree) Ph.D.
- More number of quality publications in international journals.
- Securing major research projects.
- The research contributions of the faculty is duly recognized.
- Awards to faculty and students in various conferences.

2. Title of the Practice :

Internship

Objective:

- Supporting and developing distinctive competencies of faculty members and student to build a new generation of researchers.
- Transferring and appropriating modern technology to fit with the local environment, for the purpose of national development.
- Linking research policies with goals of the universities and needs of society through providing advice and addressing problems through innovation and research.

The Context:

Research & Development Centre is sponsored by the **"VTU Research Grant" & "K-FIST" LEVEL-1** scheme by **Vision Group on Science and Technology**, Dept. of Science and technology, Govt. of Karnataka, actively engaging in Open Innovation through selective and deep Research commitments. It operates by sharing resources, leveraging ideas to create vibrant innovation systems, multiply our efforts, enhance innovation speed and efficiency, and derive more value for our organization. In addition, the need of the hour is also to promote scientific research, to enhance the technical competence of our nation. So it aims to become a top centre for learning and research, so that our organization can flourish as a place of knowledge.

The Practice:

Students are encouraged to take up Internship during vacation of sixth semester or in the vacations of seventh semester. The Eighth semester is devoted entirely to project work which is usually taken by the students at industries thereby enabling them to have industrial exposure. The Internship not only gives the students an opportunity to work in a challenging environment with state of the art technology, but also supplements their work culture through which they can gain managerial and technical skills.

An **internship** is a period of work experience offered by an organization for a limited period of time. Once confined to graduates, for a wide range of placements in businesses, non-profit organizations and government agencies. They are typically undertaken by students and graduates looking to gain relevant skills and experience in a particular field. Employers benefit

from these placements because they often recruit employees from their best interns, who have known capabilities, thus saving time and money in the long run. Internships are usually arranged by third-party organizations which recruit interns on behalf of industry groups. Rules vary from country to country about when interns should be regarded as employees. The system can be open to exploitation by unscrupulous employers.

Internships for professional careers are similar in some ways, but not as rigorous as apprenticeships for professions, trade, and vocational jobs. The lack of standardization and oversight leaves the term "internship" open to broad interpretation. Interns may be high school students, college and university students, or post-graduate adults. These positions may be paid or unpaid and are temporary.

Typically, an internship consists of an exchange of services for experience between the intern and the organization. Internships are used to determine if the intern still has an interest in that field after the real-life experience. In addition, an internship can be used to create a professional network that can assist with letters of recommendation or lead to future employment opportunities. The benefit of bringing an intern into full-time employment is that they are already familiar with the company, their position, and they typically need little to no training. Internships provide current college students the ability to participate in a field of their choice to receive hands on learning about a particular future career.

Internships exist in a wide variety of industries and settings. An internship can be paid, unpaid, or partially paid (in the form of a stipend). Internships may be part-time or full-time and are usually flexible with students' schedules. A typical internship lasts between one and four months, but can be shorter or longer, depending on the organization involved. The act of job shadowing may also constitute interning.

Presently we opted the R&D Centre of Mechanical Engineering Department to carry out our Internship as research internship, is one where in we work under a professors of R&D. Since the Centre cater the needs of all possible facilities of the Internship.

Outcomes of Internship:

- Oral Communication Skills
- Written Communication Skills
- Honesty/Integrity
- Teamwork Skills
- Interpersonal Skills
- Motivation/Initiative
- Strong work ethic
- Problem Solving Skills
- Critical Thinking Skills
- Organization Skills
- Determination
- Flexibility/Adaptability
- Practical knowledge
- Professional work experience

3. Title of the Practice:

Effective Teaching Learning Process

Innovations and best practices in Effective Teaching Learning Process

1. Goal : Teaching-learning process plays a critical role in dissemination of knowledge, the second aim of the Higher education Institute. The main stake holders in this process are students and teachers. One of the key issues in Institutions is to ensure that the quality of teaching and learning is more effective which influences in increase quality of students and the institution. This process is directly enhance the strength of students admission to the institute . The SJM Institute of Technology (SJMIT) is exploring and practicing innovations in generation of skill of faculties by the 'Effective Teaching Learning' process.

2. The Context

Learning involves challenging, refining and improving understanding by being made to think hard. Sometimes, to understand new concepts and broaden perspectives, our approaches to thinking need to be creative, imaginative. In order to impart more innovative approaches in the teaching-learning process, the institution motivates all the faculty members to attend FDPs, National and International Seminars, Conferences/Workshops organized by reputed institutions.

The following additional teaching tools and techniques are to be implemented for effective teaching- learning process.

- Working prototype models are also shown in the class rooms.
- Role plays, simulation studies, Quiz, etc., to be conducted
- PowerPoint Presentations,
- video clips of concerned topics to be shown
- use of Smart Class Rooms
- use of different software tools, systems with internet.

Apart from classroom interactions, the students undergo in-plant training, visit industries, present papers, carry out in-house projects, field studies and take up paper publication etc.,

The faculties give them guidance in all such activities so that the class room learning is effectively and innovatively supplemented.

3. The practice :

SJM Institute of Technology is implemented and adapted the following methods to achieve Effective Teaching-Learning Process

- **Establishment of Smart class rooms:**

Smart class rooms were set up in all running regular programs. These class rooms are in regular use by teachers. Use of such facility is assisting teachers in practicing the best possible innovative approaches in teaching methodology. The smart class rooms are further strengthened by providing internet facility. Thus this facility made students listen to lectures of eminent teachers and Nobel laureates across the globe.

- **LCD & Overhead projectors:**

The class rooms where smart class room facility is not available, LCD projectors are in regular use for power point presentations by teachers. This approach facilitated completion of course completion on time with ample time for revision. The Overhead projectors are also used simultaneously by teachers in routine class room teaching as per the requirement.

- **Seminars and discussion:**

A number of departments viz. Mechanical Engineering , Civil Engineering , Electrical & Electronics Engineering , Electronics & Communication Engineering ,Computer science & Engineering and other departments regularly organizes weekend departmental seminars. The students are encouraged to conduct such seminars which facilitated their active participation in discussion and interaction.

- **Group discussion with Report presentation:**

The group discussions are monitored by a panel of teachers and suggestions and guidance are provided for improvement. The students are divided into some groups, a relevant topic is given for discussion and asked to note down the main points by the group leader. After a few minutes of discussion the group leaders are asked to present their report one by one. After presentation of their report the concerned teacher summarises the main important points and explains them briefly.

- **Project works:**

Project works are part of the learning process in all programs offered by the university. Major projects of durations ranging from 6 months form part of almost all courses running on campus.

- **Field Studies**:

A number of departments organize field studies for their students. Informal feed backs from students revealed that these practices made a profound impact on teaching-learning process on the campus. Although, formal incentives are not provided, the teachers taking active part in such practices recognised by the management.

- **Placement Cell:**

The Institute Placement cell to look after the placements of students. Efforts are being made to develop MoUs with Industrial houses.

- **Entrepreneur development cell:**

The Institute set up Entrepreneurship Development Cell (EDC) to inculcate entrepreneurial skills among students.

4. Evidence for Successes

The best practices followed resulted in:

1. Semester end Examination results are improve in all programs offered by the Institute.
2. High percentage of students qualify the GATE examination
3. The placement record is also improved significantly.
4. Technical and personal ability of the students is increased..