



Best Practices (2019-20)

Best Practice-I

1. Title of the Practice:

Innovation eco system for start-up and commercialization

2. Objectives of the Practice

Prime objective of this initiative is to create young innovators and start-up technopreneur in Kumaraguru College of Technology through Institution's Innovation Council (IIC). To conduct seminar/ webinar/ workshops/ conference related to advanced and booming areas in engineering / technology, Innovation, critical thinking, start-up, entrepreneurship, Intellectual property rights, commercialization, licensing etc., To set up a greater number of pre incubation and project laboratories in the advanced areas of every department cluster. To setup facilitating centres such as incubation units, research park, Industry Institute interaction cell, Intellectual property Rights cell, Licensing/ commercialization centre etc for the benefits of students, alumni and faculty members. To create promotive policies in the area of Innovation and Entrepreneurship for sustainable development of College.

3. The Context

In recent days Innovation in Engineering and technology plays a key role in economic development of any country. When country like India with majority of young generation, it is prime responsibility of stake holders from Higher Engineering Institutions to promote and inculcate the habit of Innovation and Entrepreneurship. Students and faculty members of HEIs are with abundant of knowledge in innovation, novelty, creative thinking etc. But proper guidance, providing necessary lab facility, needy funds, introducing related government body, research methodology, facilitation for POC, prototyping, start up etc are key area

where HEIs should focus to develop the Innovation eco system. Major challenges here are Incorporating curriculum and syllabus inline with innovation eco system, lack of industry institute interaction, continuous update of technology in faster rate, lack of advanced lab facility with hardware and software, Global competition etc.

With these challenges, IIC of KCT has made several initiatives in line with the above mentioned objectives to practice the innovation eco system in the campus to move into the next level in the development of College.

4. The Practice

KCT Institute Innovation Council involves working with a variety of faculties and students in cultivating the culture Innovation and Entrepreneurship. It has secured 5 star rankings nationwide. It works with different departments and clubs inside the campus. The involvement of Garage (forum for development of products in automobile sectors), IQube (forum for software development) and Re (forum for developing the research activities) made the KCT IIC to commence various events.

KCT Garage: KCT Garage is a student involved product development center for automotive. Students of Garage design and fabricate vehicles which include All terrain vehicle, Formula Car, Quad bike, dirt bike, go – karts and solar karts. Garage is a platform to research and experiment on their new ideas about automotive components, machinery and fabricate different types of vehicles and compete in various motor sporting events around the Globe. KCT Garage serves as a student skill development center and also a design hub and consultant for custom engineering design projects. It also aids as a fabrication center and assists in manufacturing of components. We enact as a student Motorsports community. We educate and improvise through workshops and internships. We pursue on solving Industrial problems using our advancement in Research and development.

iQube: iQube is an innovation Centre for every tech enthusiasts that aims to bring out the explorer and maker within. It further help tech enthusiasts to convert their innovative ideas into commercial variable/Technically challenging prototypes. It also provides guidance and mentorship in finding path to achieve what one always dreamt of.

Re KCT: We, at Ré, work together to impart and enhance research culture in KCT. Our main aim is to bring out and motivate students to take up research and to encourage the students interested in research, to convert their ideas to reality. The projects proposed by the students will be scrutinised by a review panel pertaining to the project. The selected projects will be funded and carried out at Ré. These projects have to be framed in such a way that they can be completed within the graduation period of the students. We will also guide students to obtain patents and we will be providing them with good mentors, equipment and a better research environment. Students who finish their research work under Ré will be assisted for publishing their work as well. Ré calendar will provide students with innovative competitions and conferences happening throughout India in which students can partake in, through Ré. This research wing of KCT will provide a new platform for KCTians to seek knowledge and discover new things in science and technology.

Workshops: The conduct of workshops periodically on various innovation and entrepreneurship-related activities as prescribed by IIC cell made the students to get equipped with Industry standard skills and made the students to acquire internship and job opportunities in industries.

Lecture Series: The online lecture series conducted by IIC enables the students and faculty to acquire the knowledge in IPR, Innovation and entrepreneurship delivered by eminent resource person, that makes the quarantine period as resourceful one.

Visit to Incubation Centre: The planned activity on visit to nearby incubation centre made the student to understand the process of innovation to Start-up. The involvement of Forge Factory made the right slice for satisfying the innovative needs of the students.

Hackathon: The practice of conducting the internal hackathon enriched the student to get participate and compete in a global environment and make the students come up with inter departmental innovative projects.

5. Evidence of Success

After making several effort to fulfil the objectives, KCT reached the next level in development of innovation eco system.

Following are the outcome of the IIC activities:

- 221 innovation related programmes conducted for more than 1500 participants
- 28 pre incubation centres set up in advanced areas
- IPR cell is active and continuous registration is under process
 - 52 Patent filed and published
 - 5 Patents FER received
 - 5 Design IP registered
 - 1 Design IP granted: No.297724 Date: 27.06.2018
 - 4 copyright registered
- FORGE -Coimbatore Innovation & Business Incubator (*CIBI*)
 - Protosem feature
 - Advanced Lab Facilities
 - MBA - Innovation, Entrepreneurship & Venture Development
 - KCAIR - Kumaraguru Centre for Artificial Intelligence and Robotics

Recognitions:

- ARIIA 2019 Ranking: Ranked as Top 100
- ARIIA 2020 Ranking: Ranked as Top 25: BAND A
- IIC rating: 2019: FOUR GOLD STAR
- KCT IIC rating: 2020: FIVE GOLD STAR

6. Problems Encountered and Resources Required

(i) Problems encounter during Smart India Hackathon (SIH) 2020

Felt the need to have more industry experts during the SIH 2020 preliminary and final rounds of the Hackathon. So that the student's projects could have better refinements and improvements for the final round. Domain based experts to be identified for the review process and few mentors to identify the problem statements clearly and develop the solution accordingly. This helps the students to get more exposure about the customers' requirements and do the students innovation accordingly.

Suitable industries to be identified for the student's projects and assigning the mentor helps to do their project well.

(ii) National Innovation Contest 2020

A dedicated students and faculty teams needs to be framed in each department for increasing the student's participation and to coordinate with KCT-IIC to explore more on innovation.

7. Any other Details:

Smart India Hackathon (SIH) 2019 - KCT as Nodal Center:

During the year 2019 Kumaraguru College of Technology was one of the 48 Nodal centers to host Smart India Hackathon 2019 - Software Edition which was held on 02 & 03 March, 2019. A total of 27 teams from various part of the country participated. During this event Hon'ble Prime Minister of India, Shri. Narendra Modi interacted with the students through video conferences.

Three following teams from KCT shortlisted for regional mentoring session of National Innovation Contest NIC 2020 organized by MIC-IIC

Title	Theme	Student Name
Individual Protection System	Innovation for start up	Monica A 17BCS204
Energeia - Smart Factory Energy Management	Renewable and affordable Energy	Aishwarya G 17BCS050
Autonomous Ground Vehicle for defence	Robotics and Drones	Vinodhini R 17BMC014

Best Practice-II

1. **Title of the Practice:** Active Learning

2. Objectives of the Practice:

Active learning is an approach to instruction that involves actively engaging students with the course material through discussions, problem solving, case studies, role plays and other methods. Active learning approaches place a greater degree of responsibility on the learner than passive approaches such as lectures, but instructor guidance is still crucial in the active learning classroom. Active Learning Strategies help to initiate learners and instructors into effective ways to help everyone engage in activities based on ideas about how people learn. Multiple active learning strategies may be used in each of the active learning designs.

The main objectives are

- To help promote higher order thinking skills among the students
- To engage students in deep rather than surface learning, and enable students to apply and transfer knowledge better.
- To make the students to think, create and solve problems rather than passively listen to lecture.

3. The Context:

Active learning emphasis the focus on the learner, what a learner does, thinks, and behaves. There is a plethora of studies on the benefits of active learning. Research has proven that there is increased content knowledge for participants of the approach. In addition, development of critical thinking and problem-solving are two other benefits. Creative thinking, collaborative, and interpersonal skills also show great improvement when active learning methods are implemented.

4. The Practice:

The active learning process produces the students on having a lot more creative thinking by implementing into their basic skill of talking, listening, reading, reflecting as well as writing.

The following are some of the active learning strategies:

- **Mind mapping / Brainstorming**

These two are approaches that are classified under active learning methods. Mind mapping and brainstorming are staple methodologies for problem-solving activities. In these sessions, learners come up with ideas and post them on a board. As a group, the students then select the best ones and use those to come up with a solution. For these methods, there are available apps that allow learners to use their own device and collaborate with others in coming up with a mind-map or idea tree.

- **Clarification Pauses**

This technique aims at fostering “active listening”. Throughout a lecture, particularly after stating an important point or defining a key concept, the instructor stops talking, lets the material sink in, and then (after waiting a bit) asks if anyone needs to have anything clarified.

- **One-Minute Paper**

It is a highly effective method for checking student progress and for providing a consistent means of communicating with students. To implement this method, the instructor simply stops class a few minutes early (or pauses at some point during a lecture), poses a specific question (for example, “What was the main point presented in today’s class material?”), and give students one minute to respond.

- **Reciprocal questioning**

Use [reciprocal questioning](#) to encourage an open dialogue in which students take on the role of the teacher and create their own questions about a topic, reading section, or lesson.

Reciprocal questioning can be particularly useful when:

- (i) Preparing for tests or exams
- (ii) Introducing a new topic or section of course content and
- (iii) Discussing reading or writing materials in greater detail

- **The muddiest point technique**

The muddiest point technique involves asking students to write notes on the most unclear or most confusing element of a given homework assignment, lecture, or class discussion. Asking students to write down what they find to be the least clear is a powerful exercise because it compels them to grade or rate their own knowledge of a topic. In short, the exercise helps students reflect on the lesson and identify concepts needing further examination or study.

- **Learning by Teaching**

In a nutshell, [learning by teaching](#) means that you allow learners to prepare and teach the lessons (or part of them) to their fellow students. Although it may look like the facilitator is taking a very hands-off approach in this method, it actually involves a very elaborate process

where the facilitator is both moderator and subject matter expert. Webinars and online discussion boards are the usual media used for this methodology.

- **Role Playing**

Role playing is also another effective approach founded on active learning methods. Role playing simulates real-life situation that requires problem-solving skills. More importantly, it is also a medium for gauging actual performance. Role playing activities can include job simulations like customer interaction (facilitator plays the customer, learner the agent) through the phones, email, chat, or in some cases, virtual reality.

5. Evidence of Success:

For Digital Communication (4 credit analytical) course, few active learning methods were practiced. They are: Problem solving, Quiz programs, Role playing, One-minute paper and Clarification pause. Due to this learning method, 85 % of pass percentage was achieved in the end semester examination and this is good compared to the other section students.

6. Problems Encountered and Resources Required:

The following problems were encountered while implementing active-learning methodology.

- Coverage problem- not possible to cover as much material in a course incorporating active-learning techniques as in a course using exclusively lecture.
- It takes too much time to prepare an active-learning course.
- Students not attempting the problem section seriously and also continuous attendance needs to be ensured.

Resources required: For implementing the active learning methodology in a full pledged manner, smart classrooms can be provided.




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