

2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences

1. Experiential Learning

Field Visits:



Electrical TY Students visit to Adani Power Plant, Dahanu on 29th May 2019



Electrical SY Students visit to Peth 220 kV Substation on 3rd Feb 2019



Civil Department final Year Students Visit to karad at Krishna Bridge construction Site on 3rd January 2019



B Tech Mechanical –Students visited to “Chitale Dairy”, Bhilawadi Tal – Palus Sangli District



Students of Automobile Engineering visit to SIAT EXPO 2017 on 21st Jan. 2017

2. NETRARIT Foundation NRiT RIT-TBI: The Lamppost for Budding Entrepreneurs

The NETRARIT Foundation NRiT RIT-TBI is the Section 8 Company Registered with the Registrar of Companies [ROC], Government of India and plays the leadership role in Western Maharashtra for Development of an Incubation Centre with the vision ‘**To Develop a self-sustaining incubation model to transform engineering campus into Product Innovation Center (PIC)**’ and goal as ‘**NRiT as an Innovation Center with 100 successful start-ups by the Year -2025-30**’. The mission is ‘to develop & convert the Ideas to working prototypes/products in multi-disciplinary domains by understanding the customer needs based on real problems and commercialize it through Industry/Academic Partnerships to develop entrepreneurial eco-system in Rural area’.

Students work in interdisciplinary domains, understand customer needs and solve real problems. The process of product based learning is developed from first year engineering and sustained through-out four years in entrepreneurial eco-system. The idea behind this initiative is to develop an Entrepreneurial Eco-System in western Maharashtra. It is engaged in Pre-incubation, Incubation and Startup Support Activities at RIT, Rajaramnagar Campus.

The objectives are,

- Product Innovation Centre (PIC).
- Interdisciplinary domains for students’ project.
- Prepare locally customizable (market driven) MODELS to solve real problems.
- Curriculum Development in Innovation and Entrepreneurship.
- Create Entrepreneurial Ecosystem to nurture startups through NRiT(RIT-TBI).
- Prepare Skill Based Courses.
- To conduct Incubator Programs for its sustainability.

To create hand in hand partnership with Industries and build an innovation model with the vision of transform engineering campus into Product Innovation Centre (PIC).

Any Engineer who takes an admission to Engineering College aspire to join company or start own company after four years of study. In today’s fast changing world, Industry needs students who can become productive from first day and an Engineering College has challenge to keep the pace with industry and give an education to students who will become industry ready. Both Academia and Industry must partner to overcome these challenges. The objective of our Incubator is to create

hand in hand partnership with Industries and build an innovation model with the vision of transform engineering campus into Product Innovation Centre (PIC).

As a part of Incubator programs, students work in interdisciplinary domains, understand customer needs and solve real problems. This process of product based learning is developed from first year engineering and sustained through-out four years in entrepreneurial eco-system as shown in figure 1. The industry experts guide faculty and students in the campus itself.



Figure 1.

Innovation and Entrepreneurship Initiatives in Campus through Incubator

- Engineering Exploration Design Project– EEDP (Pre-Incubation Facilitation)
- Entrepreneurship Development Courses (1st, 2nd & final year B.Tech.)
 - First Year Engineering – Creativity, Design Thinking and Entrepreneurial Mind-set.
 - Second Year Engineering – Innovation Tools and Methods.
 - Final Year B.Tech. – ED Track
- Living Labs(Pre-Incubation Facilitation):
 - Build Autonomous Electric Vehicle -AEV
 - Industry Revolution 4.0 - IoT – IRIoT (smart-campus ideas)
- Skill Development Centre –Skill Based Courses

2. Participative Learning

1. Problem Based Learning

- Problem based learning Technique is used for various GATE related topics in Computer networks like Multiple Access Protocols , Error detection and correction , Routing Algorithms ,Classful IP Addresses ,Classless IP addresses ,Sub-netting and Super-netting
- This technique is applied to TY IT&CS students by assigning the problem in groups, Analysis of Problem and Apply knowledge to solve the given problem followed by discussion on the solutions in the group
- The Network Simulator (like Cisco) , Networking utilities (like ipconfig, ping, arp, route, traceroute and netstat etc.) , Network Packet analyzer(Like Wireshark) is very useful for computer networks course to simulate the working principle of different networking concepts and analyze the packet formats of different protocols in real network environment

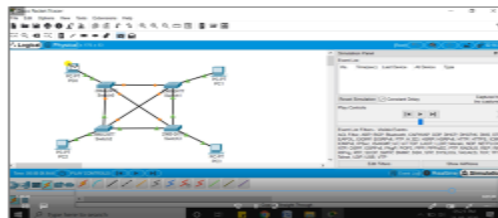
The following photos shows that steps used in PBL

Procedure for Technique Implementation

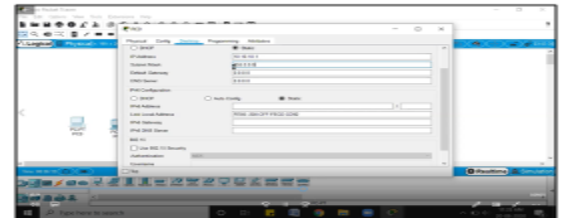


■ Use of Network Simulators and Networking utilities

- ❖ Sample Animation Video prepared about use of tool – Topologies and Networking devices
- ❖ Uploaded those video screen recording on Moodle
- ❖ Asked the students to create different network scenario and uploaded video recording of the same on Moodle



Cisco demo

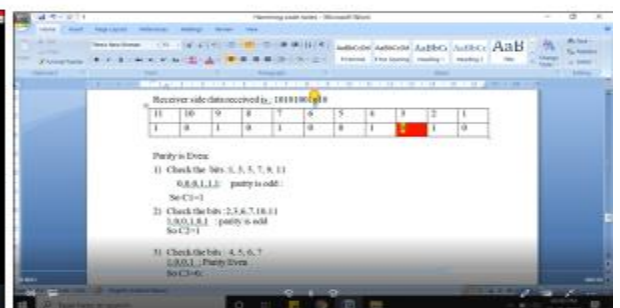
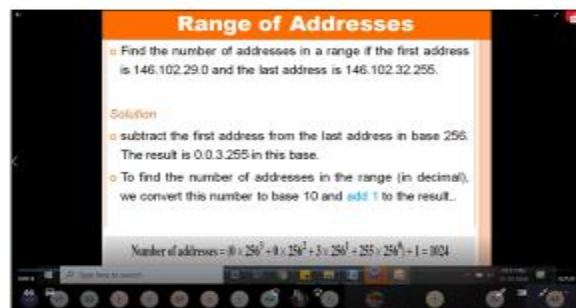


Sample Video prepared by Students

Procedure for Technique Implementation



■ Problem Based Learning

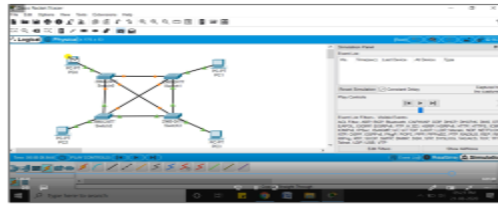


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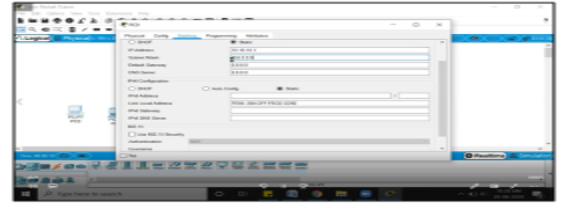
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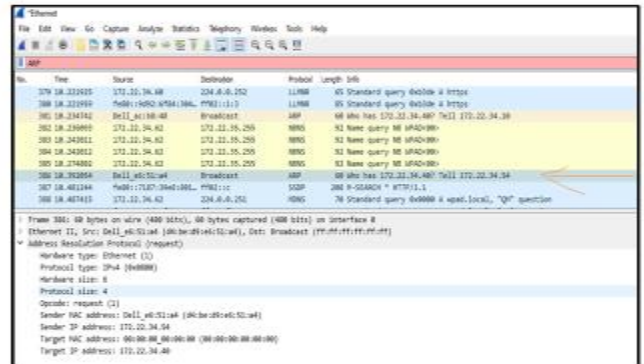
Sample Video prepared by Students

Procedure for Technique Implementation

■ Use of Network Simulators and Networking utilities

Hardware Type		Protocol Type
Hardware length	Protocol length	Operation Request 1, Reply 2
Sender hardware address: (For example, 6 bytes for Ethernet)		
Sender protocol address: (For example, 4 bytes for IP)		
Target hardware address: (For example, 6 bytes for Ethernet) (It is not filled in a request)		
Target protocol address: (For example, 4 bytes for IP)		

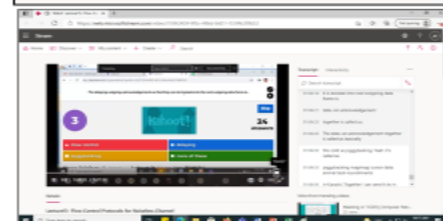
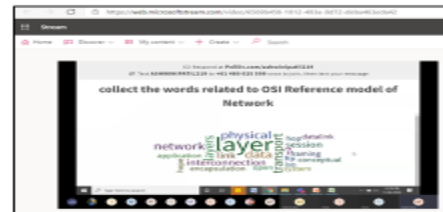
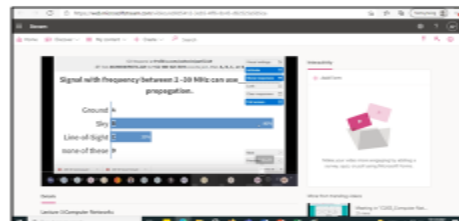
ARP Packet format



Real Captured Packet

Use of Online Platforms

- WordCloud
- Pooleveryweher: Pool
- Kahoot
- Ms Team Chat



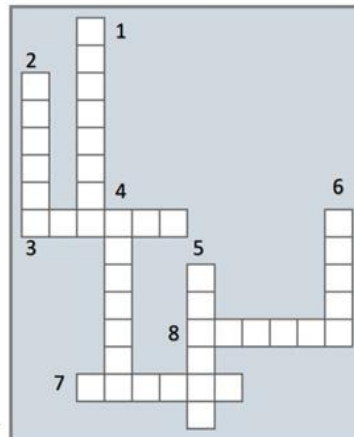
Along with problem based learning different ICT tools used like wordcloud, Kahoot, MS Team chat etc. to make students more attentive during teaching learning process.

2. Crossword puzzle

Used for TY Mechanical for course -Textile Technology

Activity for lecture 8

- Cross word – 10-15 min



Across

3. normally available
7. i am small
8. you can use me as subsystem to measure quality of yarn

Down

1. i am so big
2. i am in kg and km only
4. all about this course relate to me
5. all Starts from me only
6. shine with me

3. Interaction using Chat Box

This tool is used to check student's active involvement in class room. This is also used for problem solving and getting answer from students in class.

Interactions using Chat Box

Example 1

Example 2

10/23/2021 Dr. Sandeep Desai 13

4. Slido

This tool is used take feedback from students about understanding small contents of syllabus in the form of MCQs

3. Engineering Exploration and Design Project

The Engineering Exploration and Design Project course is an innovative course designed to be offered at first-year (Freshman) engineering so that students from all profiles and backgrounds will study and succeed in engineering. It will promote students from diverse background to study together and transform their ideas into real-life products. It comprises several activities such as problem-solving, engineering design process, multi-disciplinary engineering skills, project planning, communication, teamwork, ethics, and ensuring the sustainability of project idea along with the appreciation for diversity in general. The course comprises of multidisciplinary modules that fulfill the requirement of the product development process wherein, each activity is designed as a group activity. Heterogeneous groups of students are formed with a maximum size of four per group. Considering the need statements, week-wise activity sessions within group are planned so that students are exposed to the technical as well as soft skills. The course is designed and taught by the group of faculty (04 faculty) from the multiple engineering disciplines using Project-Based Learning (PBL) pedagogy. Facilities like; Learning Studio and Thinkering Laboratory are exclusively developed for this course. The Learning Studio is intended for an activity-based teaching process whereas the Thinkering Laboratory facilitates the product/prototype development. A project exhibition is organized at the end of semester to showcase the learning outcomes and the skills. Industry experts are invited to evaluate the student projects, share feedback to the students; and top 3 teams are presented with 'Industry Delight' awards.

The main goal of the project is to make the First year (Freshman) students think of engineering skill sets like creativity and innovation along with application of knowledge. To do this by increasing students' involvement in the teaching-learning process through collaborative activity-based instructions by multiple faculty. The engagement of first-year engineering students in the activity-based learning process ensures excitement, retention, and their satisfaction.

The major goals aimed are:

- To nurture product development culture in the campus.
- To orient student thinking to solve complex problem/s using multidisciplinary approach.
- To promote diversified need- based thinking approach in First year.
- To converts the student ideas into real-life commercial products.
- To promote team work and diversity in terms of gender and socio economic diversity.

The following photos shows the in lab demonstration of various activities.

Learning Studio: Teaching – Learning Process



Thinking Laboratory: Product Development Platform



Mechanical Equipment



Laser Cutting Machine

Sample Group Activities Conducted in Learning Studio



Poster Preparation



Poster Presentation Activity



Development of Hollow Sphere from Plain Paper



Bridge Development from Popsicle Sticks

Sample Projects Developed By Students



Automatic Bottle Filling Machine



Automatic Chocolate Sorting Machine



Automatic Path Finding Robot



Bottle Cap Sorting Machine



Pipe Inspection and Cleaning Robot



Automatic System for Security and Surveillance

The overall impact of student centric methods shows successfully improvement in placements and internships