Innovative Teaching-Learning Methods

Innovative Teaching-Learning Methods in engineering colleges may drastically enhance the educational experience through encouraging engaged participation, practical skill development, and critical thinking. In activity based learning conducted activities are Puzzles, mind-games, role play, demonstrations, brainstorming sessioactivity is explained below:

1. **Puzzles:**
   Puzzles in teaching Mechanical Engineering subjects is an excellent strategy to promote active learning, problem-solving, and conceptual understanding. This increases the probability of remembering the solution methods including the mathematical, logical problem-solving principles.
2. **Mind-games:**
   Basically to introduce mind games for various subjects helps in building logical skills in the students.
3. **Role Play:**
   Role play helps in understanding the core concepts. As an example, to explain the concept of Bubble sort role play can be used.
4. **Demonstrations:**
   To explain the working mechanism of the critical problems.
5. **Brain storming:**
   This methodology develops the critical and higher order thinking level among the learners.
6. **Group Discussions:**
   This builds the communication skills. Also builds the collaborative learning skills.
7. **Case studies:**
   A case study is an effective way to understand practical application of the skills and facts in real world situations.
8. **Hands on Making Model/Prototype Mechanism**
   To make the students conversant with Making Model/ Prototype/Mechanisms applied to real life and industrial applications.
9. **Four Board Method**
   To make the students work in team, enhancing their skills and knowledge using chalk board techniques.
10. **Flip Classroom**
    Students ability to analyze learning material, write on paper & Presentation & communication skill, Leadership Skill, Knowledge improved.
11. **Game Pedagogy**
    Pedagogy is a term that refers to both the art and the science behind how educators teach. In the context of game-based learning, pedagogy involves integrating the principles of effective teaching and learning with the unique features of games, such as interactive storytelling, problem-solving challenges, and immersive environments, to create engaging and compelling learning experiences.
12. **Preconception Check**
    Preconception Check is a teaching method that allows learner to recall what they learnt in previous classes. It can be successfully used as a reflection during classroom teaching.

13. Problem Based Learning

- For generating numerical solution of real life or engineering problems, computational thinking can be opted. It is problem based learning process in which problem is formulated, mathematical model is developed or selected and suitable computational/numerical method is implemented to solve the problem. Solution obtained from developed programming logic is testing or validated by suitable means.

14. Tactical to Practical

It is a real life problem based TL Method in which large complex problem is divided into small sections. Initial steps will be fetching data from available parameters. Apply easy to use computer method (Numerical Method). Develop user friendly solution to problem.

15. Think-Pair-Share (TPS)

Think-Pair-Share (TPS) is a collaborative learning strategy in which students work together to solve the problem or answer the question about an assigned reading. This techniques requires students to (1) think individually about a topic or answer a question and (2) share ideas with classmates

Objective:

To encourage and engage students in active learning

Outcome:

1. To have hands-on experience.
2. To motive students in active learning.
3. To work in teamwork and develop collaboration among.

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Vision: The Mechanical Engineering Department strives for making thorough professionals who are employable through quality education.

Innovative Teaching-Learning Methods

2021-22

SN	Name of Subject	Name of ITL Method	Name of Faculty
1	Kinematics of Machinery	Hands on Making Model/Prototype Mechanism	Dr. Sanjay Nikhade
2	Fluid Mechanics	Think Pair & Share Work sheet	Prof. Rahul Waghmare
3	MP	Four Board Method	Prof. Sanjay Sajjanwar
4	IE	Flip Classroom	Prof. Amar Kawale
5	IEED	Role play or Game play activity	Prof. Prakash Dhopte
6	Energy Conversion I	Game Pedagogy	Prof. Rahul Waghmare

2022-23

SN	Name of Subject	Name of ITL Method	Name of Faculty
1	Engineering Thermodynamics	Preconception Check	Prof. Rahul Waghmare
2	CAD	Problem Based Learning	Prof. Bhushan Deshmukh
3	IM	Survey	Prof. Prakash Dhopte
4	Ele. III: Advanced IC Engine	Tactical to Practical	Prof. Anurag Karande
5	Ele. I: Power Plant Engineering	Think-Pair-Share (TPS)	Prof. Sanjay Sajjanwar
6	Energy Conversion II	Game Pedagogy	Dr. Vandita Shahu

2023-24

SN	Name of Subject	Name of ITL Method	Name of Faculty
1	Kinematics of Machinery	Simulations and Do It Yourself	Prof. Safal Shmbharkar
2	Fluid Mechanics	Jig Saw Method	Prof. Amar Kawale
3	Design of Machine Elements	Crossword	Prof. Bhushan Deshmukh
4	MP	Four Board Method	Prof. Sanjay Sajjanwar
5	IE	Flip Classroom	Prof. Amar Kawale
6	IEED	Role play or Game play activity	Prof. Prakash Dhopte
7	Energy Conversion I	Game Pedagogy	Prof. Rahul Waghmare

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