



# Problem-Based Learning in Heat Transfer

**SUBJECT: HEAT TRANSFER (ME3073)**

**TY. B.TECH(MECH)**

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**PROF.P.U.SHINDE.**

**MECHANICAL ENGINEERING DEPARTMENT**

# What is Problem-Based Learning?

## **Student-Centered**

In this approach, students drive their own learning with guidance from teachers.

## **Inquiry-Based**

Students explore real-world problems and challenges, improving their problem-solving skills.

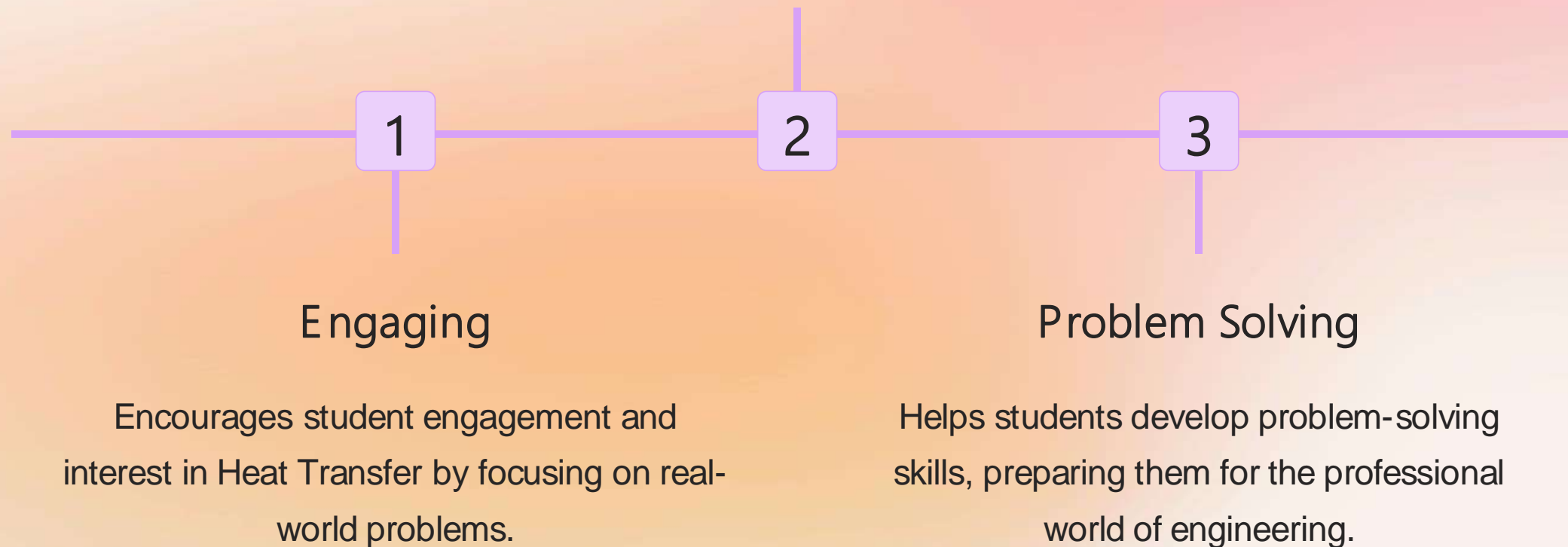
## **Active Learning**

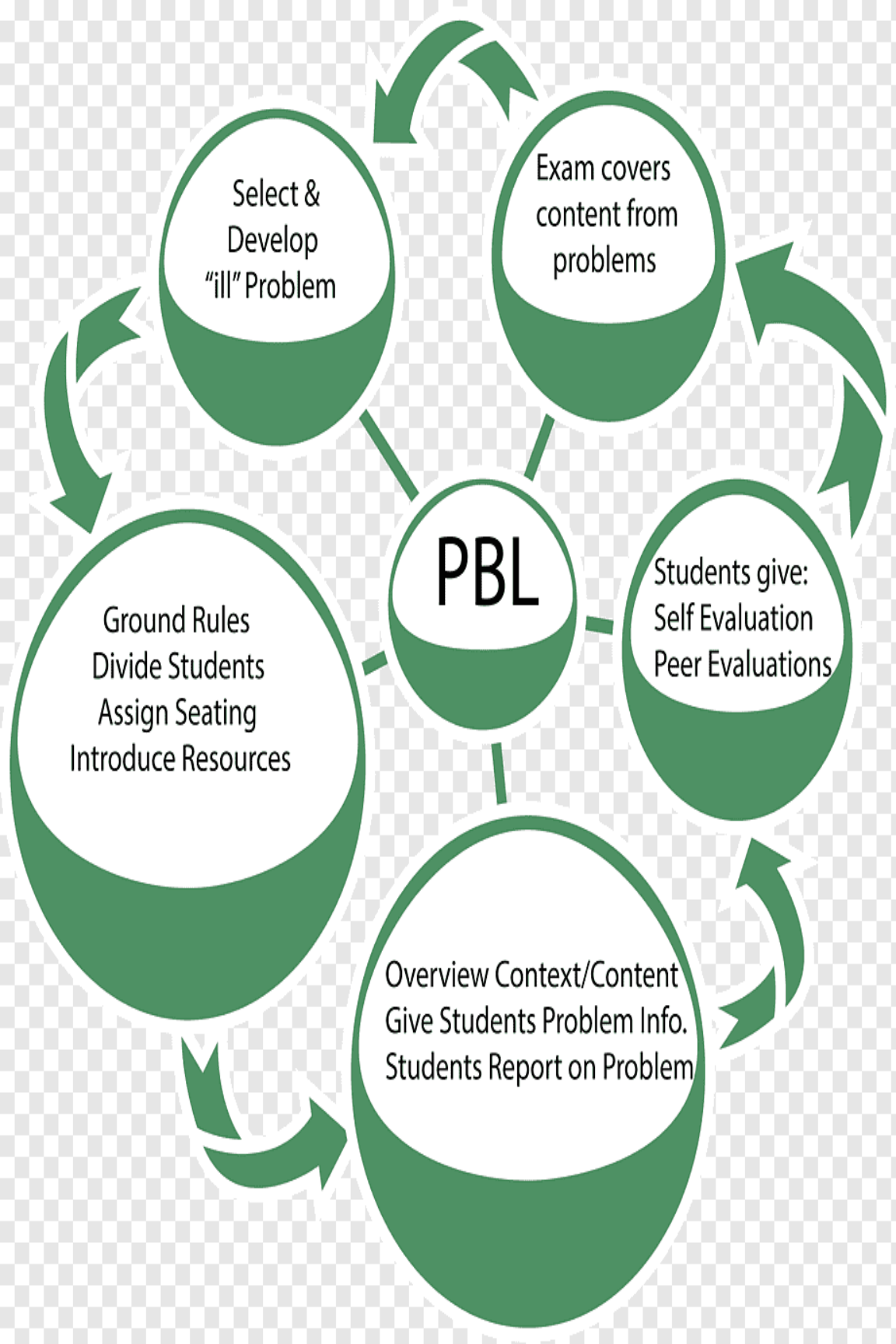
Students actively participate in the learning process rather than passively receiving information.

# Suitability of PBL to Heat Transfer

## Critical Thinking

Develops critical thinking skills as students explore challenging Heat Transfer problems and come up with solutions.





# Procedure for Implementing PBL

- **Selection of Relevant Problems:** Selected real-world Heat Transfer problems that challenged students to apply their theoretical knowledge to practical situations.
- **Forming Student Groups:** Divided the class into small groups to foster effective collaboration between students with diverse strengths and backgrounds.
- **Facilitating Group Discussions:** Provide guidance and feedback to groups as they work through the problem and arrive at solutions.

# Outcomes of PBL in Heat Transfer

1

## Understanding of Modes of Heat Transfer

By exploring and solving challenging Heat Transfer problems, students will be able to identify the dominant mode of heat transfer, calculate heat transfer rates, and propose appropriate engineering solutions.

2

## Designing Heat Exchangers

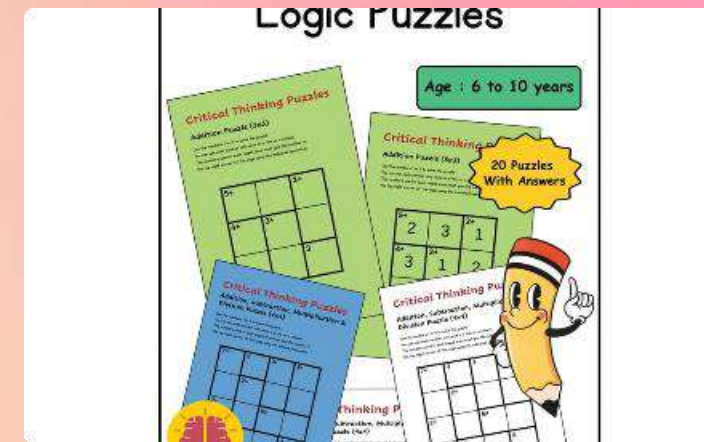
Through PBL, students will be evaluated based on their experimental design, data collection, analysis, and interpretation of results to determine thermal conductivity and convective heat transfer coefficients, ultimately leading to the design of an indirect tube type heat exchanger.

# Benefits of PBL



## Teamwork

PBL promotes effective collaboration and teamwork, preparing students for professional engineering environments.



## Critical Thinking

PBL challenges students to think critically and develop creative solutions to complex real-world problems.



## Relevance to the Real World

PBL makes learning relevant to the real world, preparing students for professional challenges they will face in their careers.

# Challenges of PBL

## 1 Time Management

Ensuring timely completion of group projects whilst ensuring all students have a comprehensive understanding of the curriculum.

## 2 Assessment

Developing effective assessment criteria that account for group work and individual contributions.

## 3 Group Dynamics

Managing different personalities and strengths within groups to foster effective collaboration.

# CONCLUSION

Problem-Based Learning is an effective teaching method for Heat Transfer that promotes critical thinking, problem-solving skills, and prepares students for professional engineering environments. The benefits make PBL a worthwhile investment in the future of engineering education.



THANK YOU...!!!

