

## Mechanical Engineering Department

### Innovative Teaching Method - Report

Academic Year – 2020-21	Class: TE
Semester – I	Date : 12/12/2020
CO: CO4, CO6	PO: PO1, PO2, PO3, PO4, PO9, PO10, PO12

- 1. Title of Innovation method/activity:** Think-Pair-Share
- 2. Link shared to the students:** <https://forms.gle/9KPvY2eSrmsVbjRD9>
- 3. Name of Faculty:** Dr. S.B.Sonawane
- 4. Course:** Heat Transfer (C302)
- 5. Objective of Method**
  - a.** Create the awareness of forced convection and heat exchanger
  - b.** Analyze forced convection and heat exchanger

- c. Compute pressure drop and pumping power
- d. Determine the performance of heat exchanger

## **6. Topic Covered through Activity**

Analysis and performance evaluation of heat exchangers

## **7. Description of method with Benefits (8 – 10 lines)**

### **Description of method**

Monitor and support students as they work through the following in this method:

**T** : (Think) Teachers begin by asking a specific question about the text. Students "think" about what they know or have learned about the topic.

**P** : (Pair) Each student should be paired with another student or a small group.

**S** : (Share) Students share their thinking with their partner. Teachers expand the "share" into a whole-class discussion.

### **Benefits of method**

- It helps students to think individually about a topic or answer to a question.
- It teaches students to share ideas with classmates and builds oral communication skills.
- It helps focus attention and engage students in comprehending the reading material.
- The Think-Pair-Share activity gives students the opportunity to feel more comfortable sharing their thoughts.

## 8. Roles and Responsibilities

- **Teacher**

- Develop the awareness among the students about the industrial applications of heat exchanger
- Selection of heat transfer application (engine oil cooler is selected in this method) .
- Provide the study material on working, analysis and performance evaluation of heat exchanger and appropriate guide lines at every stage
- Remain available during the completion of task.
- Prepare assessment methodology.

- **Student**

- Go through all the material provided on heat exchanger
- Once topic assigned, understand it and solve independently. After this each student should be paired with another student or a small group and discuss any doubt with his partner. Then students have to discuss individually within the group.
- Actively participate in group and contribute by means of discussion

- **Group**

- Form the group of members as per the guidelines by teachers.
- Understand and discuss to finalize the best solution for the assigned task.
- Assign the work within the group to achieve the task within stipulated time period

## 9. Assessment Tools

Q. No.	Portfolio	Marks
1.	<b>Engine oil cooler assembly details</b>	
	An engine oil cooler consists of a bundle of 25 smooth tubes, each of length $L = 2.5$ m and diameter $D = 10$ m. If oil at 300 K and a total flow rate of 24 kg/s is fully developed flow through the tubes, what is the pressure drop?	2M
2.	<b>Pumping power calculation</b>	
	Using same data of Q.1, what is the pump power requirement	3M
3.	<b>Think</b>	
	On your own, write the procedure to solve the problem given in Q.1:	4M
4.	<b>Pair</b>	
	Discuss your procedure to solve the above problem with a partner. Put a check by any procedure, above, that your partner also wrote down. Then, write down procedure your partner had that you did not have:	3M
5.	<b>Share</b>	
	Share: Review all of your procedure and circle the one you think is most important. One of you will share this procedure with the whole group. As you listen to the procedure of the whole group, write down the most appropriate procedure to solve the problems	3M

Q. No.	Portfolio	Marks
6.	<b>Concentric tube heat exchanger</b>	
	Consider a concentric tube heat exchanger with an area of 50 Sq. m operating under the following conditions. Determine the outlet temperature of the hot fluid.	1M

7.	Using the data of Q.6, What you think? <b>Is the heat exchanger operating in parallel flow or counter flow</b>	1M
8.	Using the data of Q.6, Calculate the overall heat transfer coefficient.	1M
9.	Using the data of Q.6, Calculate the effectiveness of this exchanger.	1M
10	Using the data of Q.6, what would be the effectiveness of this exchanger if its length were made very large?	1M
11.	<b>Think</b>	
	On your own, write the procedure to solve the problem given in Q.6	4M
12.	<b>Pair</b>	
	Discuss your procedure to solve the above problem with a partner. Put a check by any procedure, above, that your partner also wrote down. Then, write down procedure your partner had that you did not have:	3M
13.	<b>Share</b>	
	Review all of your procedure and circle the one you think is most important. One of you will share this procedure with the whole group. As you listen to the procedure of the whole group, write down the most appropriate procedure to solve the problems	3M

### 10. Evaluation sheet of attendee

Sr. No.	Roll No.	Name of students	Score out of 30
1	144	Harshal Sukhdev Mundane	24
2	138	Samyak Mandar Vaidya	30
3	107	Karan Pund	30
4	117	Avinash Raghunath Savale	30
5	126	Shingote Pragati Ramnath	30
6	116	Vivek ramdas sangale	30
7	112	Pratik Raosaheb Rote	30
8	110	Ranade Aditya Shivaji	30

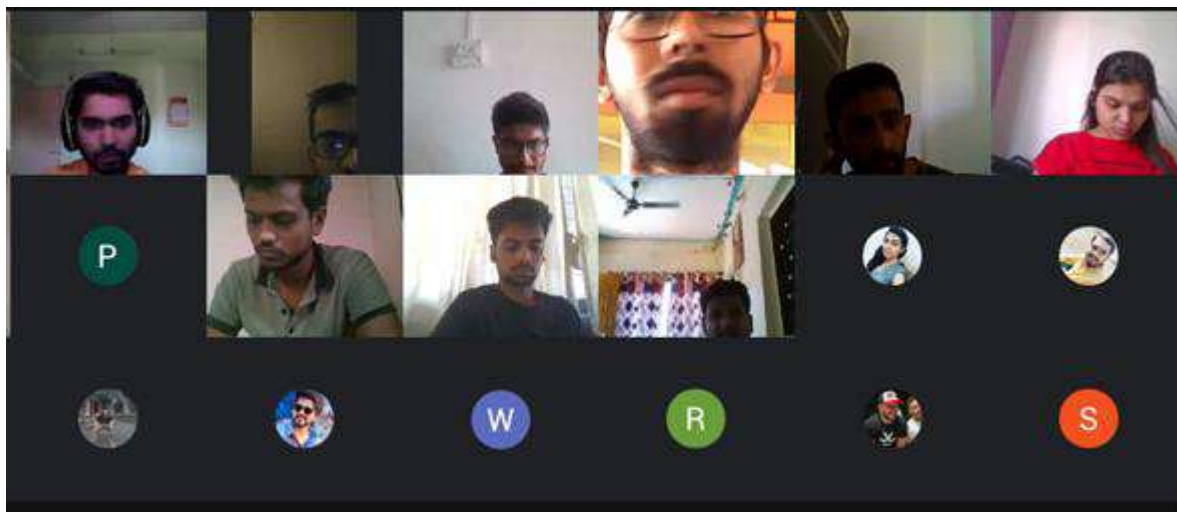
9	123	Rohit Raju Shinde	27
10	118	Rishikesh Sawant	30
11	114	Yashwant Salunke	30
12	142	Pranit Yawalkar	27
13	100	Shubham Patil	24
14	135	Vinay Rajendra Thete	30
15	120	Harsh Sunil Shinde	27
16	136	Thok Nikita kailas	30
17	102	Vaibhavi Suresh Patil	30
18	125	Ujwala Mahesh Shinde	30
19	133	Adarsh Sanjay Thakur	27
20	115	Gaurav Sharad Sanap	30
21	128	Priyanka dhondiram shirsath	30
22	89	Ajinkya Dilip Pagar	18
23	143	Akshay Sanjay Zope	27
24	141	Saurabh Warungse	30

## 11. Impact Analysis

Sr. No.	3- High/Excellent	2 - Moderate /Average	1- Slight/Poor
1. Did you understand and cover the objective of the activity?	84.6%	15.4%	--
2. Do you find that methodology is helpful to cover the content beyond syllabus?	69.2%	30.8%	--
3. Does this helps you for building a good team?	69.2%	23.1%	7.7%
4. Does the content covered are relevant and will be helpful as a	53.8%	46.2%	--

Life - long learning?			
5. Can you want to conduct such activity again?	76.9%	23.1%	--

## 12. Activity Picture



## 13. For review and critique contact: e-mail address of faculty and HOD

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