Department of Electrical and Electronics Engineering
Academic Year 2022 – 2023 (Even Semester)

Degree, Semester & Branch: VI Semester B.E. EEE
Course Code & Title: EE8691 Embedded Systems
Name of the Faculty member: Mrs. S. Sharmila Kumari, AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit I / Watchdog Timer and Real Time Clock
- **Course Outcome:** CO 1
- **Topic Learning Outcome:** TLO 6
- **Activity Chosen: Mini-map**
- **Justification:**
  - Differentiate Watch Dog Timer and Real Time Clock
  - After teaching the concept, I thought of conducting this activity for making the students to give the difference between the two concepts which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 5 Minutes

After teaching the concept, the students were made to pair with their neighbors

Reporter: Myself

At the end the Class (Last 6 minutes)

- ✓ I asked the students to think about Watch Dog Timer and Real Time Clock concept for 2 minute.
- ✓ Then I told them to Pair with their neighbors and discuss about the concepts for another 1 minute.
- ✓ Finally I told them to design mini-map and submit within 3 minutes.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO10	PO12	PSO2	PSO3
C315.1	3	1	1	1	1	1	1

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO3	PO10	PO12	PSO2	PSO3
	3	1	1	1	1	1	1
Justification for correlation	Students will apply electronic engineering concepts to solve engineering problems. Hence it is substantially correlated (level 3).	Students will identify the mathematical, engineering and other relevant knowledge that applies to the selection of processor & memory devices, DMA and memory management unit. Hence it is slightly correlated (level 1).	Students will determine the design objectives and functional block of embedded system. Hence it is slightly correlated (level 1).	Students will be able to communicate the technical concept through Active Learning Methods. Hence it is slightly correlated (level 1).	Students will use the electronic fundamentals in the advancement of embedded system technology. Hence it is slightly correlated (level 1).	Students will be able to design and test the electronic system in the engineering applications. Hence it is slightly correlated (level 1).	Students will be able to design and develop the hardware and software with microprocessor skills required for industrial automation systems. Hence it is slightly correlated (level 1).

- **Images / Screenshot of the practice:**

❖ *Reflective Critique:*

1. **Pre-implementation Reflection :**

- **Benefits:**

  I preferred this Activity because they have Watch Dog Timer and Real Time Clock separately.

- **Challenges:**
  - ❖ In the class mostly boys hastate to answer to the questions.
  - ❖ Time utilization for conducting activity.

  Steps taken:
  - ❖ The boys are sitting in 2 columns – I planned to choose more pairs from boys to involve them in the activity.

2. **Post-implementation Reflection :**

- **Benefits:**
  - ➢ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
- **Challenges:**
  - ➢ Slow learners were not able to understand some topics during discussion hours.

❖ *Benefit of the practice**:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

✓ The assessment of effectiveness of the activity was felt when told most of the points.

✓ While conducting the activity, I understood that the students will be able to explain the concepts of Watch Dog Timer and Real Time Clock.

✓ The success of the activity was evaluated by asking the same question in **Internal Assessment test I – Around 50% of students answered**.

References:

1. https://omerad.msu.edu/teaching/teaching-strategies/active-learning-strategies/27-teaching/184-visual-modeling-mini-maps

Signature of Faculty Member **HOD**

Department of Electrical and Electronics Engineering
Academic Year 2022 – 2023 (Even Semester)

Degree, Semester & Branch: VI Semester B.E. EEE
Course Code & Title: EE8691 Embedded Systems
Name of the Faculty member: Mrs. S. Sharmila Kumari, AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit II / Serial Bus Communication Protocols
- **Course Outcome:** CO 2
- **Topic Learning Outcome:** TLO 9
- **Activity Chosen: Visual Clickers**
- **Justification:**
  - Differentiate RS 232,RS 422 and RS 485
  - The topic Serial Bus Communication Protocols (RS 232, RS 422 and RS 485) are used for the serial communication purpose. After teaching the concept, I thought of conducting this activity for making the students to give the difference between the three concepts which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 6 Minutes

After teaching the concept of RS 232, RS 422 and RS 485, the students were made to pair with their neighbours

Total Strength is 55, Number of Pairs – minimum 6 in one team
Photographer: one student - Myself
Reporter: Myself
At the end the Class (Last 6 minutes)

- I asked the students to think about RS 232, RS 422 and RS 485 concept for 1 minute.
- Then I told them to Pair with their neighbours and discuss for another 1 minute.
- With the help of PPT prepared (Multiple choice questions) students use their clickers to respond to the question and then the answers were be projected to the students.
- After completion of the class I uploaded the PPT in the course website (Canvas)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
C315.2	3	2	2	1	1	1	1	1

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
	3	2	2	1	1	1	1	1
Justification for correlation	Students will apply electronic engineering concepts to solve engineering problems. Hence it is substantially correlated (level 3).	Students will compare various bus communication protocols and contrast alternative solutions for bus communication to select the best protocol. Hence, it is moderately correlated (level 2).	Students will apply formal bus communication protocols to develop multiple engineering design solutions. Hence, it is moderately correlated (level 2).	Students will be able to work with their team through Active Learning Methods. Hence it is slightly correlated (level 1).	Students will be able to communicate the technical concept through Active Learning Methods; hence it is slightly correlated (level 1).	Students will use the electronic fundamentals in the advancement of embedded system technology; hence it is slightly correlated (level 1).	Students will be able to design and test the electronic system in the engineering applications. Hence it is slightly correlated (level 1).	Students will be able to design and develop the hardware and software with microprocessor skills required for industrial automation systems. Hence it is slightly correlated (level 1).

- **Images / Screenshot of the practice:**




❖ *Reflective Critique:*

1. **Pre-implementation Reflection :**

I preferred this Activity because they have RS232, RS422 and RS485 separately.

Challenges anticipated:

Time utilization for conducting activity.

2. **Post implementation Reflection:**

- **Benefits:**
  - ➢ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
- **Challenges:**
  - ➢ Student clicker's were not clear in photos. So clicker tools prepared from students were not advisable.

❖ *Benefit of the practice:* (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

✓ The assessment of effectiveness of the activity was felt when told most of the points.

✓ While conducting the activity, I understood that the students will be able to explain the concepts of RS232, RS422 and RS485.

✓ The success of the activity was evaluated by asking the same question in Internal Assessment test I – **All the students answered.**

References:

1. https://omerad.msu.edu/teaching/teaching-strategies/active-learning-strategies/27-teaching/184-visual-modeling-visualclicker

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Department of Electrical and Electronics Engineering
Academic Year 2022 – 2023 (Even Semester)

Degree, Semester & Branch: VI Semester B.E. EEE
Course Code & Title: EE8691 Embedded Systems
Name of the Faculty member: Mrs. S. Sharmila Kumari, AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit III / Object Oriented Model
- **Course Outcome:** CO 3
- **Topic Learning Outcome:** TLO 14
- **Activity Chosen: Think-Pair-Share**
- **Justification:**
  - Differentiate Object Oriented Model, State machine model, Concurrent model and Sequential model.
  - The topic Object Oriented Model, State machine model, Concurrent model and Sequential model are used for the same purpose. After teaching the concept, I thought of conducting this activity for making the students to give the difference between the different models concepts which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 6 Minutes

After teaching the concept, the students were made to pair with their neighbours.

Total Strength is 60, Number of Pairs – 10

Photographer: one student - Mr. S. Arun Kumar (interested in photography)

Reporter: Myself

At the end the Class (Last 6 minutes)

- ✓ I asked the students to think about Object Oriented Model and other model concept for 2 minute.
- ✓ Then I told them to Pair with their neighbours and discuss about the difference between the models for another 1 minute.
- ✓ Finally, I selected on Pair from each column randomly and ask them to share one difference between the concepts. (3 miuntes)
- ✓ When each pair told the points simultaneously, I wrote the points on the board.
- ✓ Finally, I summarized the points and I told one missed point to all the students.
- ✓ With the help of PPT prepared (first slide- Activity name, Second slide-Topic for Think-pair-share, Third slide - answer) the answers were be projected to the students.
- ✓ After completion of the class I uploaded the PPT in the course website (Canvas)

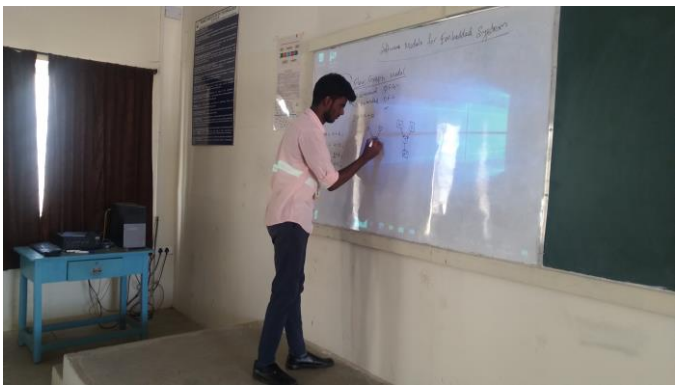
- **CO – PO / PSO mapping:**

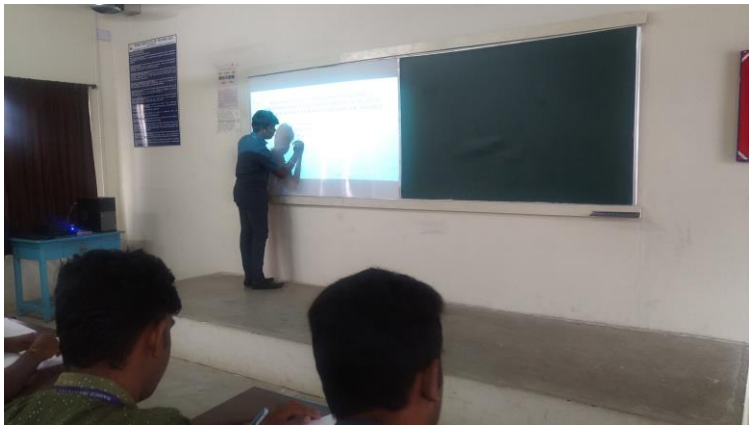
CO	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
C315.3	3	2	2	1	1	1	2	1

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
	3	2	2	1	1	1	2	1
Justification for correlation	Students will apply electronic engineering concepts to solve engineering problems. Hence it is substantially correlated (level 3).	Students will compare various embedded development strategies and contrast alternative solutions for firmware environments to select the best model. Hence, it is moderately correlated (level 2).	Students will apply various embedded developmen t strategies to develop the embedded firmware environment s. Hence, it is moderately correlated (level 2).	Students will be able to work with their team through Active Learning Methods. Hence it is slightly correlated (level 1).	Students will be able to communicat e the technical concept through Active Learning Methods; hence it is slightly correlated (level 1).	Students will use the electronic fundament als in the advancem ent of embedded system technology ; hence it is slightly correlated (level 1).	Students will be able to design and test the electronic system in the engineerin g application s. Hence it is moderately correlated (level 2).	Students will be able to design and develop the hardware and software with microproce ssor skills required for industrial automation systems. Hence it is slightly correlated (level 1).

- **Images / Screenshot of the practice:**





❖ *Reflective Critique:*

1. Pre-implementation Reflection :

I preferred this Activity because they have Object Oriented Model, State machine model, Concurrent model and Sequential model separately.

Challenges anticipated:

❖ In the class mostly boys hastate to answer to the questions.

❖ Time utilization for conducting activity.

2. Post implementation Reflection:

- **Benefits:**

➢ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.

- **Challenges:**

➢ Slow learners were not able to understand some topics during discussion hours.

Benefit of the practice: (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

✓ The assessment of effectiveness of the activity was felt when told most of the points.

✓ While conducting the activity, I understood that one point was missed with respect to method of computation and finally I insisted the point they missed to tell.

✓ The success of the activity was evaluated by asking the same question in Internal

✓ Assessment test II – Around 30% of students answered correctly.

References:

1. http://www.readwritethink.org/professional-development/strategy-guides/using-think- pair-share-30626.html
2. https://in.video.search.yahoo.com – Think pair share

Signature of Faculty Member **HOD**

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Academic Year 2022 – 2023 (Even Semester)

Degree, Semester & Branch: VI Semester B.E. EEE
Course Code & Title: EE8691 Embedded Systems
Name of the Faculty member: Mrs. S. Sharmila Kumari, AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit IV / Semaphores, Mailbox and Pipes
- **Course Outcome:** CO 4
- **Topic Learning Outcome:** TLO 21
- **Activity Chosen: One Minute Paper**
- **Justification:**
  - Differentiate semaphores, mailbox and pipe
  - After teaching the concept, I thought of conducting this activity for making the students to give the difference between semaphores, mailbox and pipe which enhance the learning level and as a teacher I can judge the understanding level of the students.
- **Time Allotted for the Activity:** 3 Minutes

After teaching the concept, give students one or two minutes to think about the topic without writing anything.

Total Strength is 60

Reporter: Myself

At the end the Class (Last 3 minutes)

- ✓ I asked the students to think about Mailbox and pipes from inter process communication for 2 minutes.
- ✓ Then I told them to write as much as they can within a short period of time (1 minute)
- ✓ Finally, I collected the papers from each column (1 minute)

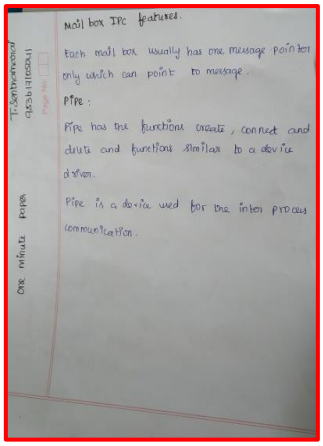
- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO10	PO12	PSO2	PSO3
C315.4	3	2	2	1	1	2	1

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO3	PO10	PO12	PSO2	PSO3
	3	2	2	1	1	2	1
Justification for correlation	Students will apply electronic engineering concepts to solve engineering problems. Hence it is substantially correlated (level 3).	Students will compare various scheduling techniques and contrast alternative solutions for RTOS operation. Hence, it is moderately correlated (level 2).	Students will apply various scheduling techniques to develop the best RTOS operation solution. Hence, it is moderately correlated (level 2).	Students will be able to communicate the technical concept through Active Learning Methods. Hence it is slightly correlated (level 1).	Students will use the electronic fundamentals in the advancement of embedded system technology. Hence it is slightly correlated (level 1).	Students will be able to design and test the electronic system in the engineering applications. Hence it is moderately correlated (level 2).	Students will be able to design and develop the hardware and software with microprocessor skills required for industrial automation systems. Hence it is slightly correlated (level 1).

- **Images / Screenshot of the practice:**



❖ *Reflective Critique:*

1. Pre-implementation Reflection :

I preferred this Activity because they have semaphores, mailbox and pipes separately.

Challenges anticipated:

❖ In the class mostly boys hastate to answer to the questions.

❖ Time utilization for conducting activity.

2. Post implementation Reflection:

- **Benefits:**

➢ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.

- **Challenges:**

➢ Slow learners were not able to understand some topics during discussion hours.

Benefit of the practice: (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

✓ The assessment of effectiveness of the activity was felt when told most of the points.

✓ While conducting the activity, I understood that the students will be able to explain the concepts of semaphores,mailbox and pipes.

References:

1. https://omerad.msu.edu/27-teaching/177-minute-papers
2. Shibu. K.V, "Introduction to Embedded Systems", 2e, Mc graw Hill, 2017.

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Name of the Faculty member: Mrs. S. Sharmila Kumari, AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit V / Case Study of ATM Machine Application
- **Course Outcome:** CO 5
- **Topic Learning Outcome:** TLO 25
- **Activity Chosen: Flipped Class Room**
- **Justification:**
  - Flipped classroom is a "pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter"
- **Time Allotted for the Activity:** 30 Minutes

Total Strength is 60

Reporter: Myself

At the Class (30 minutes)

- ✓ I shared the material related to the topic through canvas LMS.
- ✓ Then I told them to prepare the topic as a team with a help of PPT.

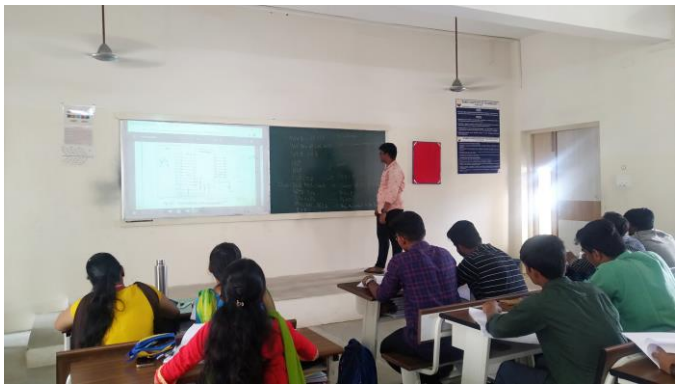
- **CO – PO / PSO mapping:**

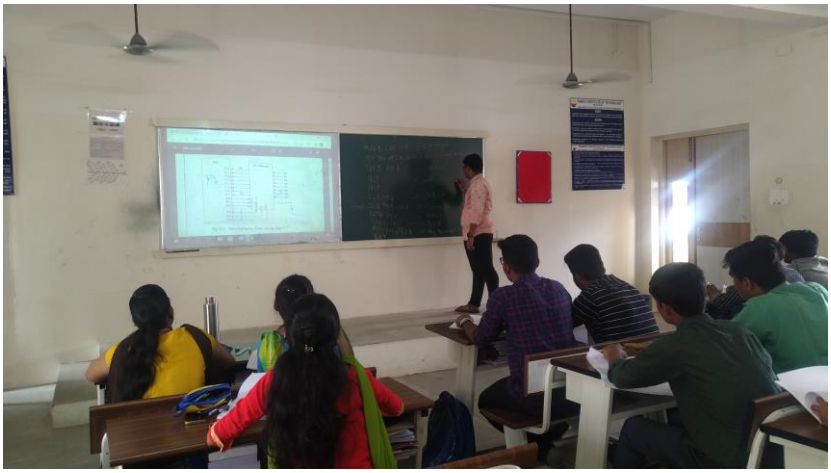
CO	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
C315.5	3	3	2	1	1	1	2	3

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO3	PO9	PO10	PO12	PSO2	PSO3
	3	3	2	1	1	1	2	3
Justification for correlation	Students will apply electronic engineering concepts to solve engineering problems. Hence it is substantially correlated (level 3).	Students will combine hardware and software engineering concepts to formulate a model/s of an automation application system that is appropriate in terms of applicability and required accuracy. Hence it is substantially correlated (level 3).	Students will apply various embedded system design algorithms to develop the automation application. Hence, it is moderately correlated (level 2).	Students will be able to work with their team through Active Learning Methods. Hence it is slightly correlated (level 1).	Students will be able to communicate the technical concept through Active Learning Methods; hence it is slightly correlated (level 1).	Students will use the electronic fundamentals in the advancement of embedded system technology; hence it is slightly correlated (level 1).	Students will be able to design and test the electronic system in the engineering applications. Hence it is moderately correlated (level 2).	Students will be able to design and develop the hardware and software with microprocessor skills required for industrial automation systems. Hence it is substantially correlated (level 3).

- **Images / Screenshot of the practice:**





Benefits:

- This practice improves the peer coaching / studying with in the class. Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.

References:

1. https://www.panopto.com/blog/7-unique-flipped-classroom-models-right/
2. Shibu. K.V, “Introduction to Embedded Systems”, 2e, Mc graw Hill, 2017.

Signature of Faculty Member **HOD**