5.6. Innovations by the Faculty in Teaching and Learning

The Faculty of the department has been implementing Information, Communication and Technology (ICT) and activity based teaching methodologies to enhance the learning capabilities of the students. Integrating these methodologies into teaching, students will become more engaged in their work and feel teaching-learning more fun and enjoyable. As a consequence of this increased engagement, they will be able to retain knowledge more effectively and efficiently.

Table 5.6.1. List of some activities implemented in teaching and learning by faculty.

S.No	Teaching Methods	Types of Activity	Purpose/Description
1	ICT based Teaching	Vishnu Institute of Technology has been implementing own Learning management system platforms like www.vishnuplacements.in www.skill2030.com	Vishnu learning management platforms are designed as user friendly LMS where the students can access the entire data base on a single click.
		Google Classrooms, Google forms, MS Teams, Kahoot, Edpuzzle and Hackerrank Platforms	Best online platforms for lectures, discussions, group conversations, Programming assessments, quizzes and assessment tools.
		Mobile Applications for real time and Practical understanding.	Tinkercad Circuits, Circuit Solver are software tool applications for building and creating circuits. Teachers can make the students to build, analyse and verify the circuits for better understanding.
2	Activity based Teaching	Think-Pair -Share	The Think-Pair-Share (TPS) activity is a collaborative learning strategy that enhances student engagement, critical thinking, and communication. It fosters individual reflection, peer discussion, and group sharing, making learning more interactive and effective.
		Role Play	Role playing is a learning structure that allows students to immediately apply content of the given topic. This technique is an excellent tool for engaging students and allowing them to interact with their peers as they try to complete the task assigned to them in their specific role.
		Mind Maps	Mind Mapping is a learning technique which uses a non-linear approach that encourages the students to think and explore concepts using visual-spatial relationships. The great advantage of

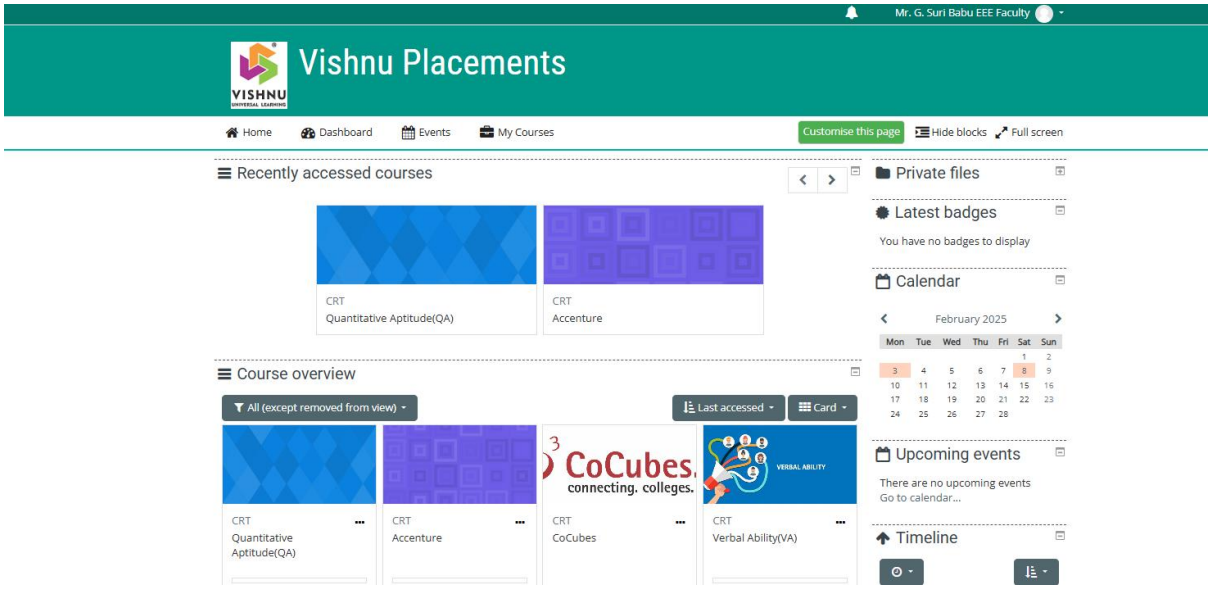
			a Mind Map is that it literally "maps" the way a student's brain sees and creates connections, once mastered, it brings incredible clarity, understanding and ease to decision-making process
		Teaching through MATLAB/Simulink	MATLAB enhances teaching and learning by enabling simulation-based education, data analysis, and real-world problem-solving. Faculty use it for interactive lessons, while students gain hands-on experience in engineering.
3	e-Learning	NPTEL courses and e-Journals	Faculty are encouraged to register for NPTEL swayam courses in every academic year for understanding the potential concepts much effectively. Also, e-resources available in digital library to access various reputed journals and books for teaching and learning.
4	VEDIC(Vishnu Educational Development and Innovation Centre)	Scientific Educational Practices, Students Learning in Instructional Design, Inspire-Impact-Introspect, Think – Technology- Transform	VEDIC is a residential campus established in 2016 by college management, where faculty members, staff and students interact in a collaborative environment with global experts to create rich, engaging experiences to further innovations in learning and research.

5.6.1. ICT Based Teaching

The college maintains its own user-friendly Learning Management System (LMS) for seamless access to educational resources. The platforms **www.vishnuplacements.in**, **www.skill2030.com**, and **www.vedic.dev** enable students to log in using their college email IDs from any location.

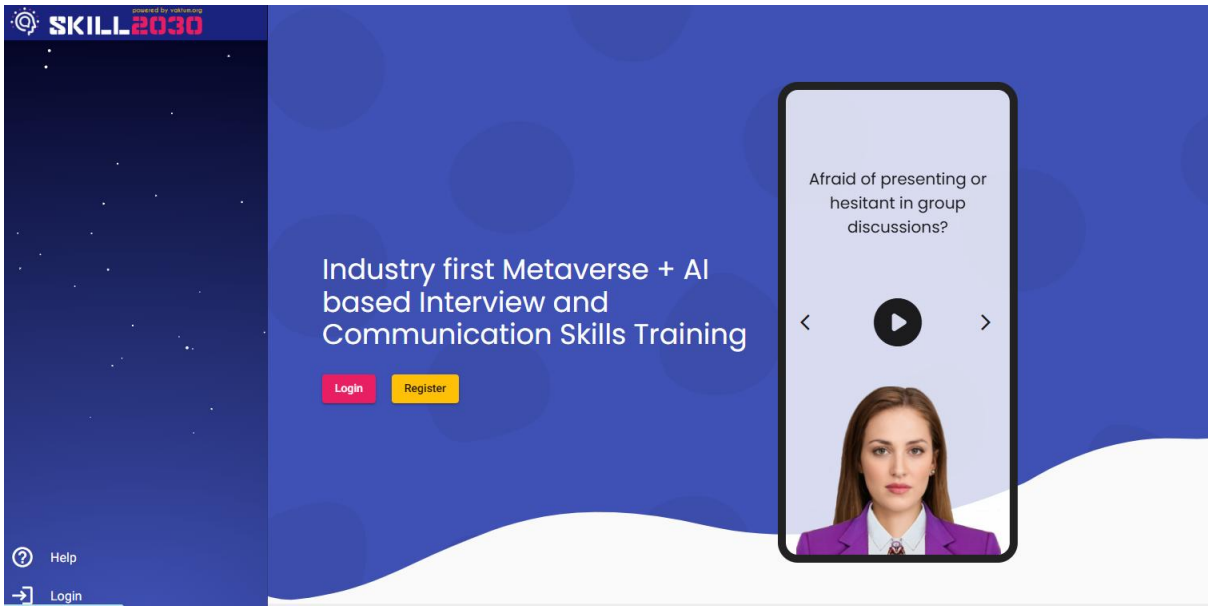
5.6.1.1. Vishnu Placements Moodle (www.vishnuplacements.in)

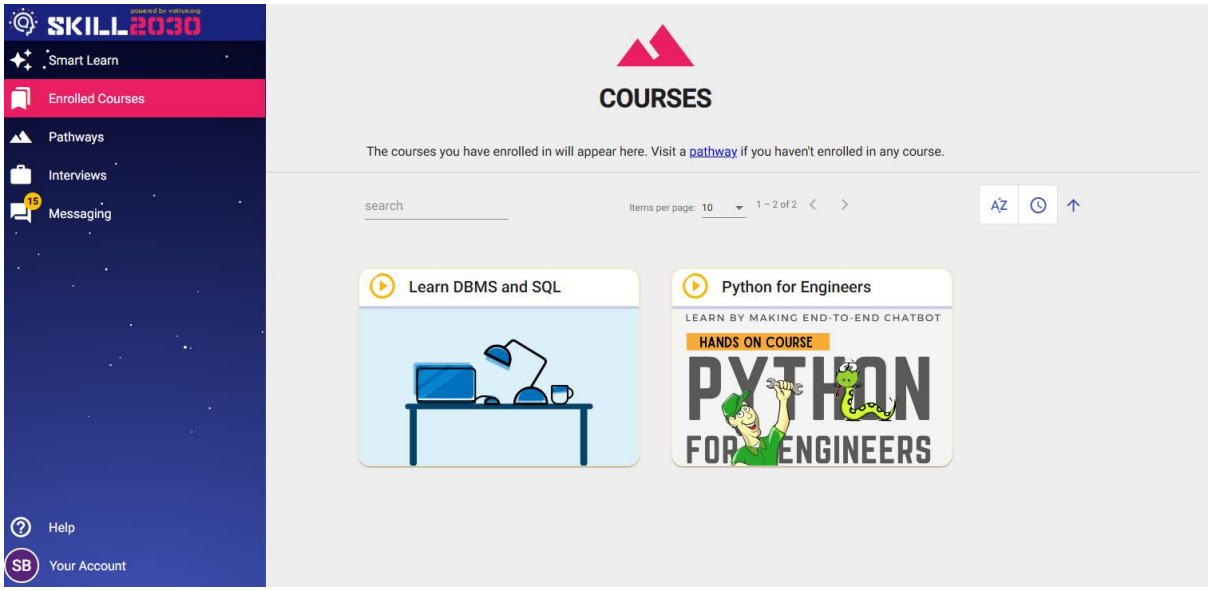
Faculty upload and manage course materials on VishnuPlacements.in, allowing students to easily access learning resources. The platform includes content on Engineering core concept , Aptitude, Reasoning, Verbal Ability, Competitive Coding, HR & Technical Interviews. Students can enrol in courses, explore a wide range of practice tests, and prepare according to their learning needs or specific company requirements. This structured approach helps students enhance their technical knowledge and improve their placement readiness.



5.6.1.2. Advanced Technical Communication Skill training Skill (www.skill2030.com)

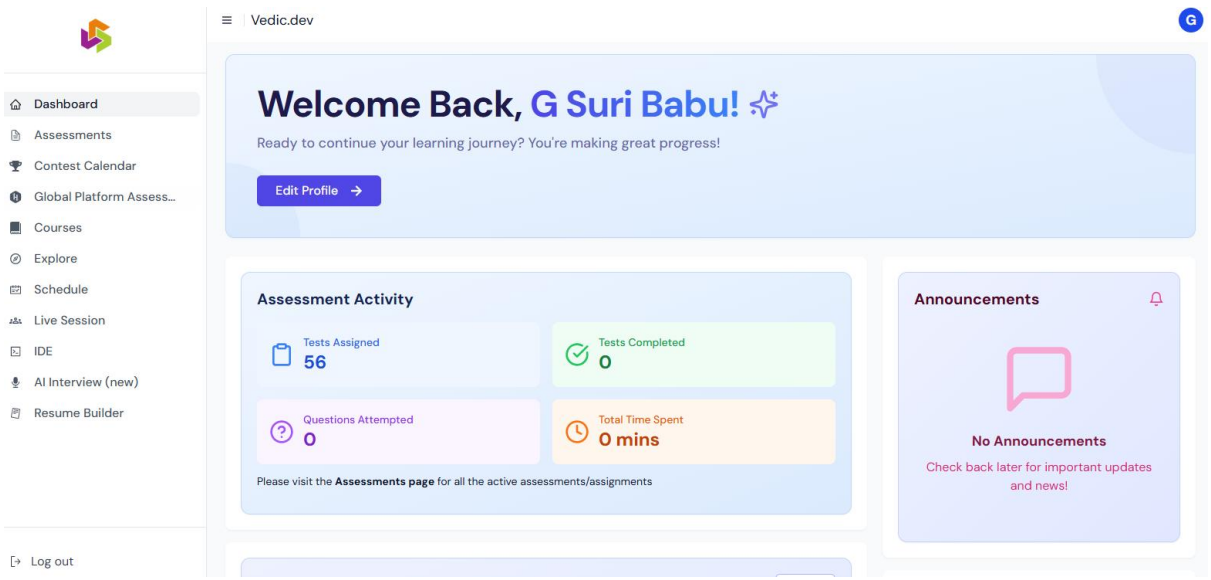
Skill2030 is a unique training system designed by Vishnu Institute of Technology to teach professional level scientific and Technical communications in English to the students. This is an AI enabled platform where students can practice mock interviews virtually.





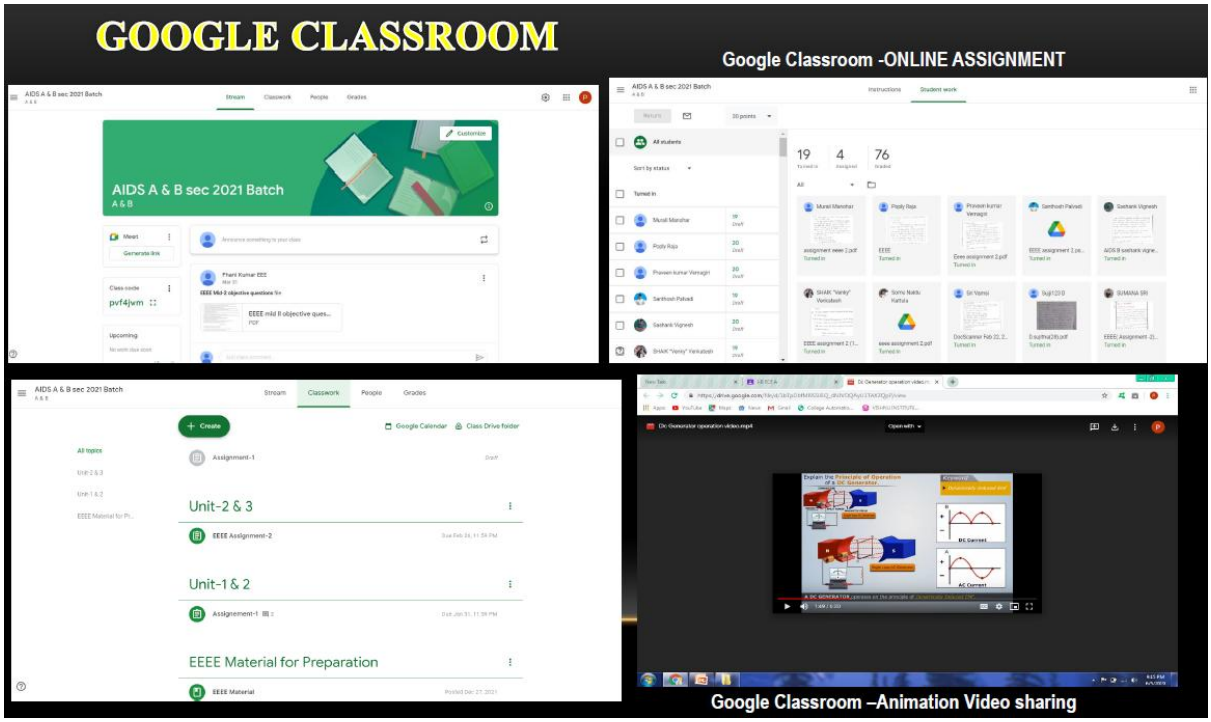
5.6.1.3. Vishnu LMS (vedic.dev)

vedic.dev is an online Learning & Assessment Platform designed to facilitate education and skill development for the students of Vishnu Institute of Technology. It provides a user-friendly interface for managing courses, assessments, and learning resources. Students and educators can access the platform from anywhere to enhance their learning experience.



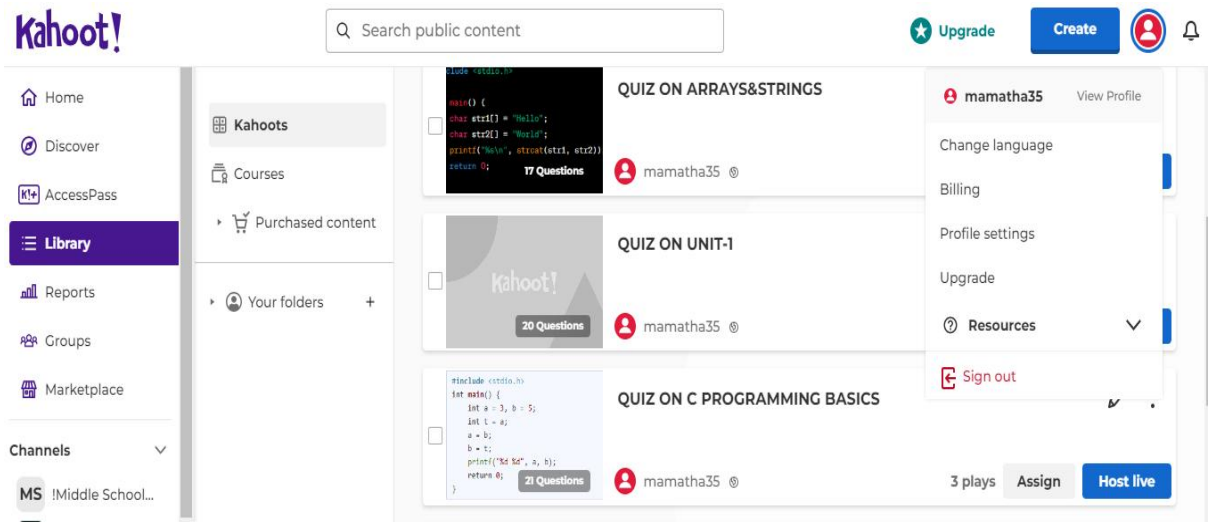
5.6.1.4. Google Classroom

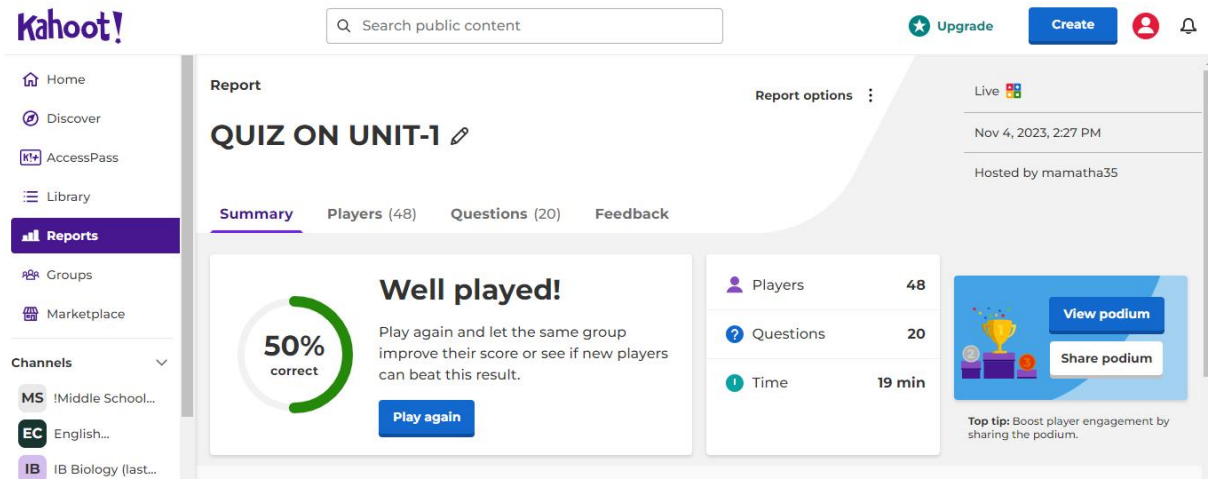
Faculty use Google Classroom to organize course materials, assignments, and assessments, enabling seamless communication and collaboration with students. It enhances interactive learning by providing a centralized platform for resource sharing, feedback, and real-time discussions.

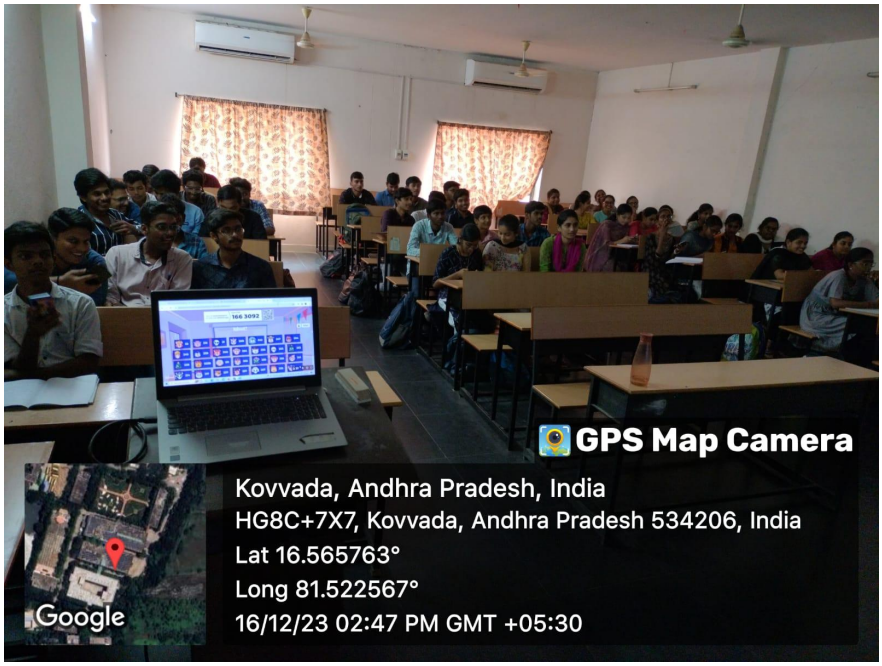


5.6.1.5. KAHOOT

Kahoot is global learning platform makes it easy for any individual or corporation to create, share, and host learning sessions that drive compelling engagement. Kahoot! sessions can be hosted anywhere, in person or virtually, using any device with an internet connection.

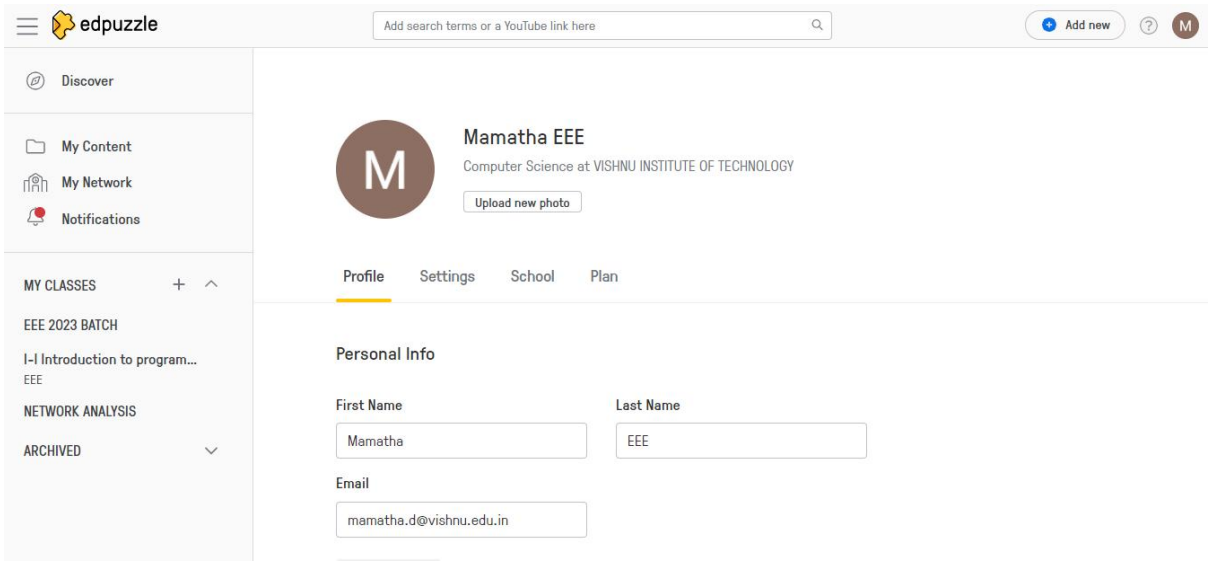






5.6.1.6. Edpuzzle

EdPuzzle is a free assessment-centered tool that allows teachers and students to create interactive online videos by embedding either open-ended or multiple-choice questions, audio notes, audio tracks, or comments on a video.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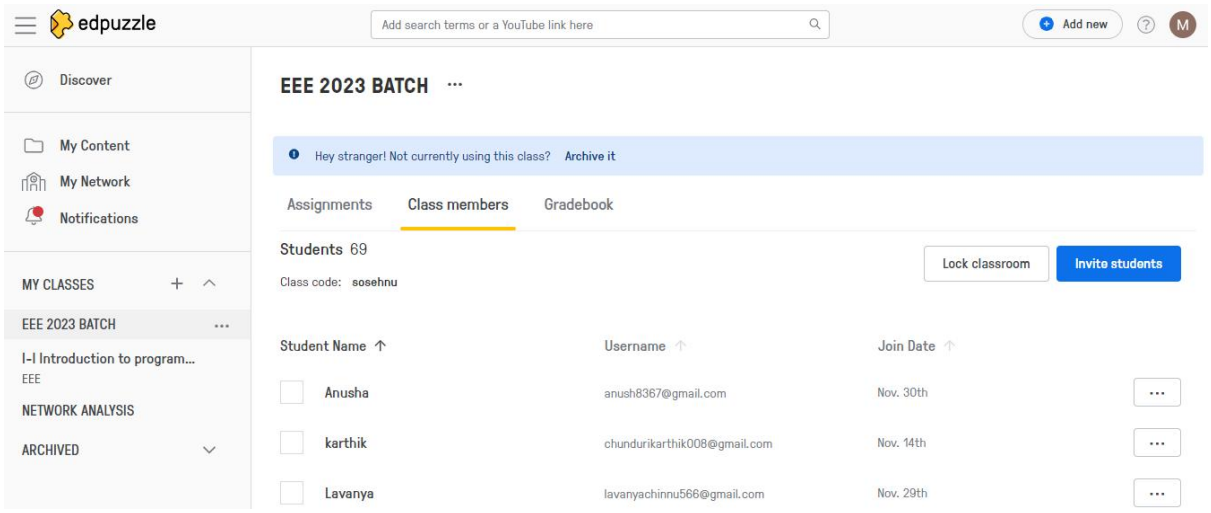
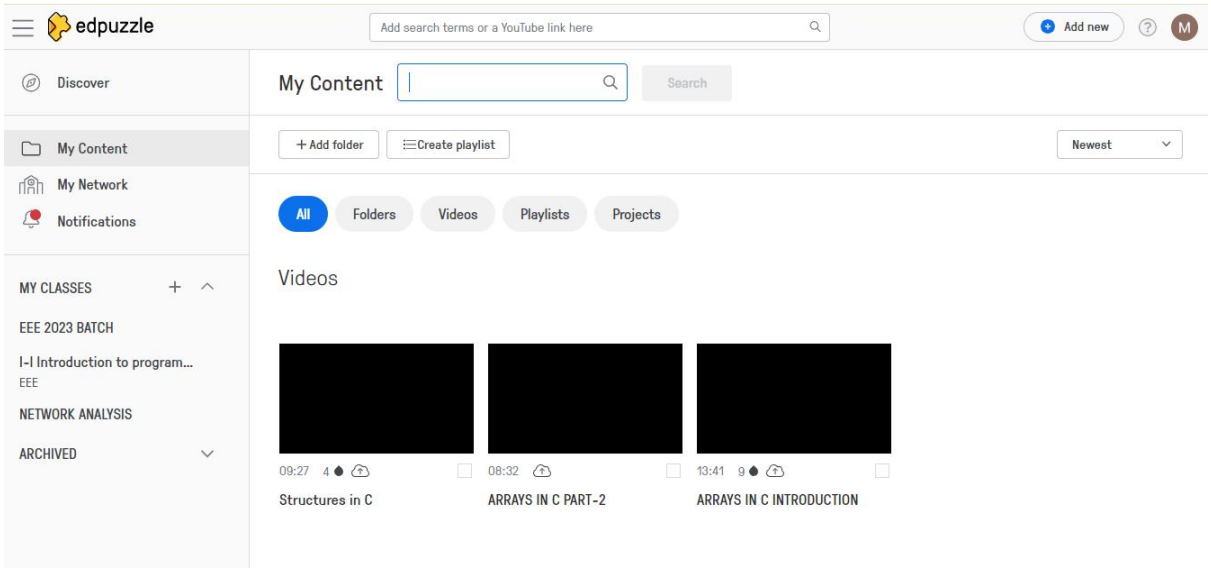
EEE 2023 BATCH
I-I Introduction to program...
EEE
NETWORK ANALYSIS
ARCHIVED
Mamatha EEE
Computer Science at VISHNU INSTITUTE OF TECHNOLOGY
Upload new photo
Profile
Settings
School
Plan
Personal Info
First Name
Mamatha
Last Name
EEE
Email
mamatha.d@vishnu.edu.in


edpuzzle
Add search terms or a YouTube link here
Add new
Discover
My Content
My Network
Notifications
MY CLASSES
EEE 2023 BATCH
I-I Introduction to program...
EEE
NETWORK ANALYSIS
ARCHIVED
EEE 2023 BATCH
Hey stranger! Not currently using this class? Archive it
Assignments
Class members
Gradebook
Students 69
Class code: sosehnu
Lock classroom
Invite students
Student Name
Username
Join Date
Anusha
anush8367@gmail.com
Nov. 30th
karthik
chundurikarthik008@gmail.com
Nov. 14th
Lavanya
lavanyachinnu566@gmail.com
Nov. 29th


edpuzzle
Add search terms or a YouTube link here
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EEE 2023 BATCH
I-I Introduction to program...
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NETWORK ANALYSIS
ARCHIVED
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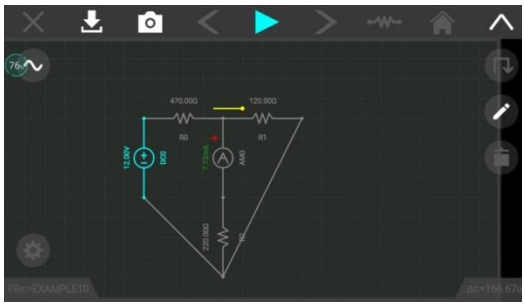
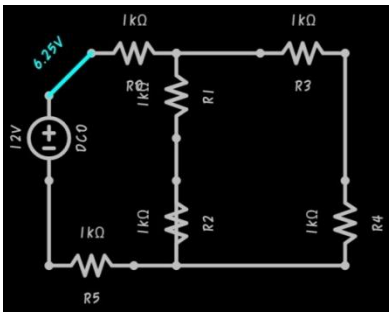
Search
+ Add folder
Create playlist
Newest
All
Folders
Videos
Playlists
Projects
Videos
09:27
Structures in C
08:32
ARRAYS IN C PART-2
13:41
ARRAYS IN C INTRODUCTION

5.6.1.7. Circuit Solver: Simulator & Schematic Editor

Circuit Solver is an electronic circuit board application where students can build the circuits by connecting inbuilt electrical components. To simulate the circuits, a matrix is defined based on all the components inside the circuit and this application solves the circuit using matrix manipulations such as LU-Decomposition and matrix inversion. Students can simulate DC simulation, transient simulation and non-linear simulation and can visualize the waveforms through the use of built in oscilloscope.

Name of the Faculty: Mrs.D.Mamata	**Designation**: Asst.Prof	**Subject**: Electrical Circuits
Year/Semester: II /I Sem	**Section:** EEE A	**No. of Students Participated**: 30
Name of the Activity: Circuit Solver application	**Topic**: KVL and KCL	

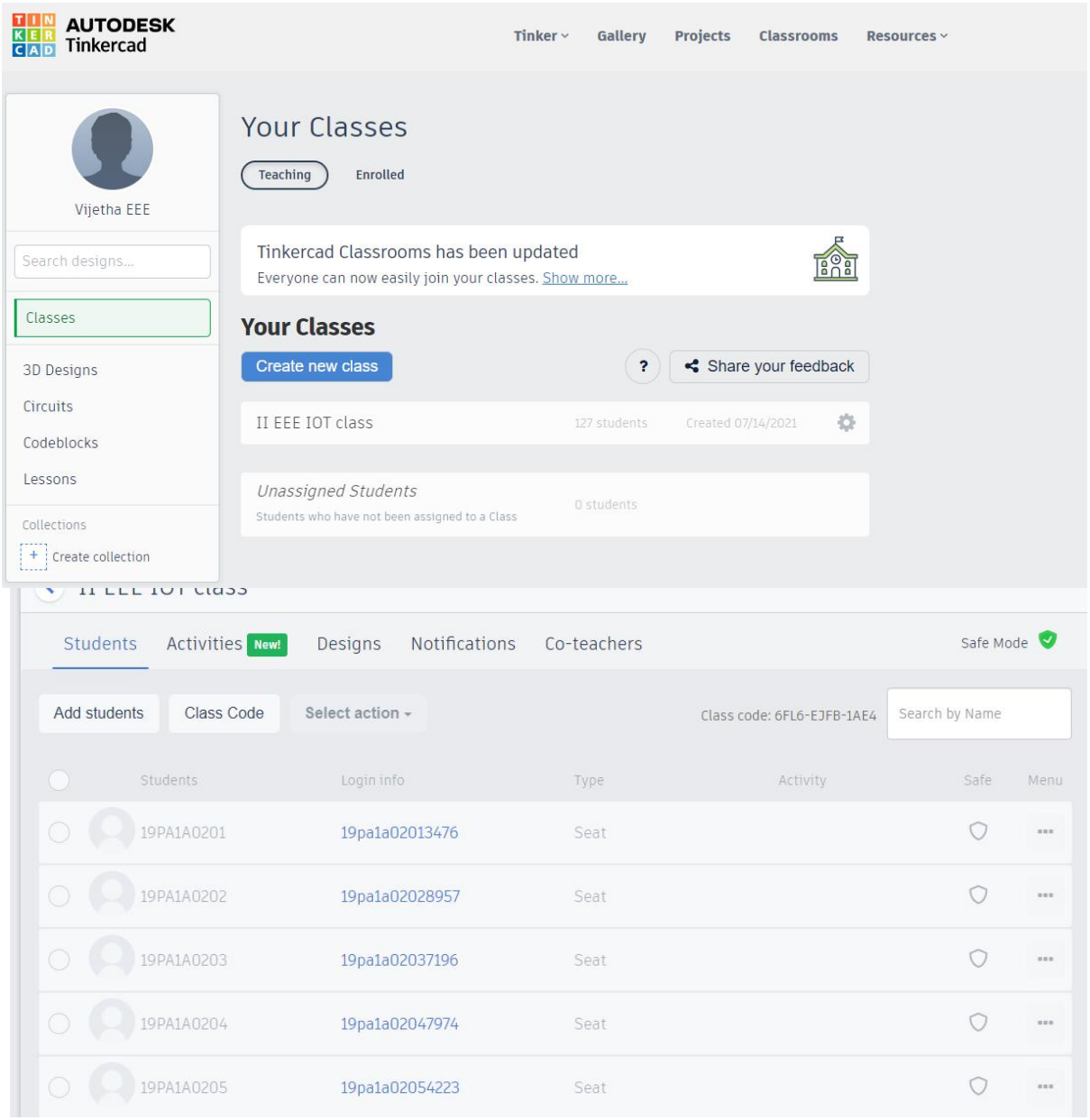




5.6.1.8. Tinkercad

Tinkercad is an easy-to-use web application that enables the students to design circuits to arduino programming using in built components.

Name of the Faculty: Mrs.I.V.V.Vijetha	**Designation**: Asst.Prof	**Subject**: Internet of Things Laboratory
Year/Semester: II /I Sem	**Section:** EEE A	**No. of Students Participated**: 103
Name of the Activity: Tinkercad application	**Topic**: LED Switching with two switches	


AUTODESK Tinkercad
Tinker
Gallery
Projects
Classrooms
Resources
Vijetha EEE
Search designs...
Classes
3D Designs
Circuits
Codeblocks
Lessons
Collections
Create collection
Your Classes
Teaching
Enrolled
Tinkercad Classrooms has been updated
Everyone can now easily join your classes. Show more...
Your Classes
Create new class
Share your feedback
II EEE IOT class
127 students
Created 07/14/2021
Unassigned Students
Students who have not been assigned to a Class
0 students
Students
Activities
New!
Designs
Notifications
Co-teachers
Safe Mode
Add students
Class Code
Select action
Class code: 6FL6-EJFB-1AE4
Search by Name
Students
Login info
Type
Activity
Safe
Menu
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19pa1a02013476
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19PA1A0202
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19PA1A0204
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19pa1a02054223
Seat

5.6.2.Activity Based Teaching

5.6.2.1. Think-Pair-Share

The Think-Pair-Share method is an interactive teaching strategy that promotes critical thinking and collaboration. Students first think independently about a topic, then pair up to discuss their ideas, and finally share their insights with the class. This approach enhances engagement, communication, and deeper understanding of concepts.

THINK-PAIR-SHARE-REPEAT

	Prompt or Question or Issue to discuss	What I Thought / My Opinion	What My Partners Thought / My partners opinion	What we will share / Points to report / share with larger audience	Remarks
21PAIAS49	Determine V_x	Nodal Analysis	Mesh Analysis	Mesh Analysis is used to find current easily. Nodal Analysis is also easy to find voltages	2 2 3 3 10
21PAIAS49	Determine V_x	Mesh analysis	Nodal Analysis	Nodal Analysis is used to find current easily & Mesh analysis is also easy to find voltages. But I prefer Mesh	2 2 3 3 10
21PAIAS49	Determine V_x	Nodal Analysis	Mesh Analysis	mesh analysis is used to find current easily & Nodal analysis is also ~~find~~ easy to find voltage.	2 2 3 3 10

5.6.2.2. Role Play

This technique is an excellent tool for engaging students and allowing them to interact with their peers as they try to complete the task assigned to them in their specific role.

Name of the Faculty: P.Naveen	**Designation**: Asst.Prof	**Subject**: Control Systems
Year/Semester: II /I Sem	**Section:** EEE B	**No. of Students Participated**: 50
Name of the Activity: Role Play	**Topic**: Effect of PID Controller	

5.6.2.3. Mind Maps

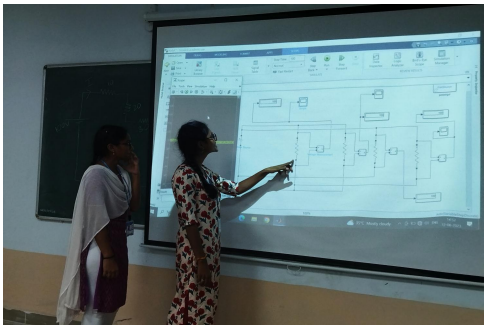
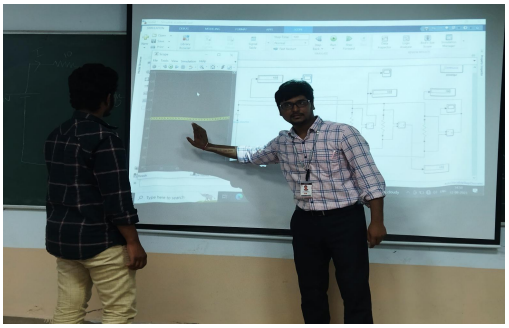
Name of the Faculty: Dr.S.Pragaspathy	**Designation**: Professor	**Subject**: Renewable Energy Sources
Year/Semester: III /I Sem	**Section:** EEE B	**No. of Students Participated**: 35
Name of the Activity: Mind Maps	**Topic**: Renewable Energy Sources	

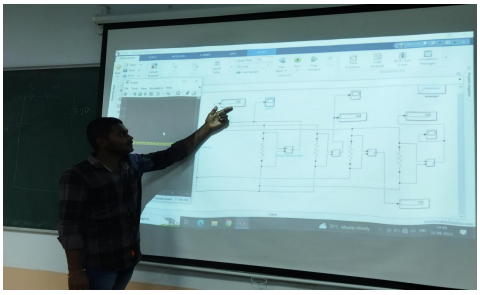


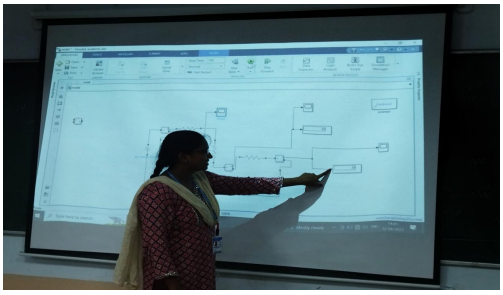


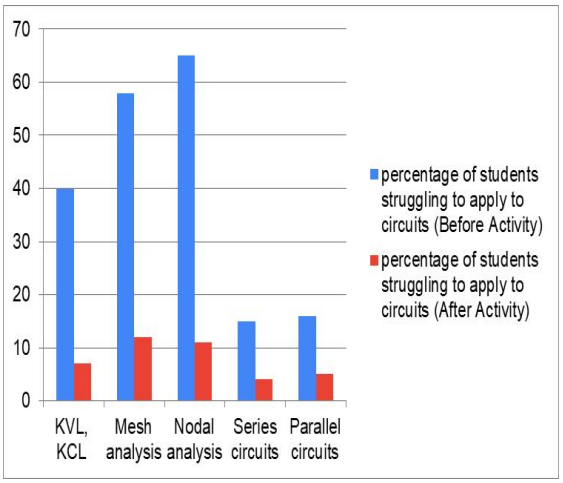
5.6.2.4. Teaching through MATLAB/Simulink

Name of the Faculty: Dr.I.Kasi Reddy	**Designation**: Associate Professor	**Subject**: Design of Electrical Circuits
Year/Semester: II/I	**Section:** EEE	**No. of Students Participated**: 66
Name of the Activity: MATLAB simulation of Electrical Circuits	**Topic**: Mesh and Nodal analysis	







5.6.3 e-learning

As part of continuous learning and skill enhancement, faculty are encouraged to enrol in online courses on advanced technologies through the NPTEL platform, which offers certifications from globally recognized technical universities. Additionally, the digital library provides access to reputed journals, books, and e-resources, supporting high-quality teaching and learning.

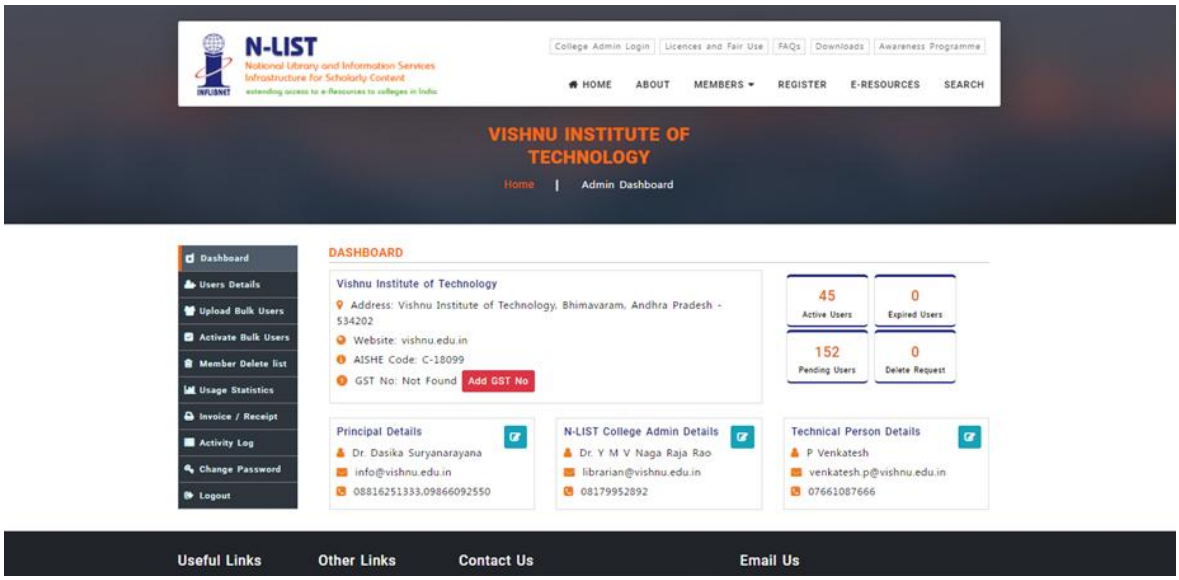
Table 5.6.3.1. List of Faculty enrolled NPTEL Courses during assessment years.

	List of Faculty enrolled NPTEL Courses in 2024-2025			
S.No	**Faculty Name**	**MOOC**	**Course Name**	**Duration**
1	Dr. I Kasireddy	NPTEL	Control Systems	12 Weeks
2	Dr. I Kasireddy	NPTEL	A Basic Course on Electric and Magnetic Circuits	12 Weeks
3	Mr.Phani Kumar Ch	NPTEL	Smart Grid: Basics to Advanced Technologies	12 Weeks
4	Dr. S. Reddi Khasim	NPTEL	A Basic Course on Electric and Magnetic Circuits	12 Weeks
5	M.Lavanya	NPTEL	Cloud Computing	12 Weeks
6	I.V.V. Vijetha	NPTEL	Computer Networks and Internet Protocol	12 Weeks
7	P.Naveen	NPTEL	A Basic Course on Electric and Magnetic Circuit	12 Weeks

8	N Veeraiah	NPTEL	A Basic Course on Electric and Magnetic Circuit	12 Weeks
9	D Mamatha	NPTEL	Programming in modern c++	12 Weeks
10	D Mamatha	NPTEL	Cloud Computing	12 Weeks
11	K.Bhanu Priya	NPTEL	Practical Cyber security for cyber security Practioners	12 Weeks
12	K.Bhanu Priya	NPTEL	Cloud Computing	12 Weeks
13	G Suri Babu	NPTEL	Soil Fertility and Fertilizers	12 Weeks
	List of Faculty enrolled NPTEL Courses in 2023-2024			
	Faculty Name	**MOOC**	**Course Name**	**Duration**
1	Dr. I Kasireddy	NPTEL	The Joy of Computing using Python	12 Weeks
2	Mr.Phani Kumar Ch	NPTEL	Power Quality	12 Weeks
3	M.Lavanya	NPTEL	Ethical hacking	12 Weeks
4	Dr. R.V.D. Rama Rao	NPTEL	Sustainable power generation systems	12 Weeks
5	D.Mamatha	NPTEL	Introduction To Machine Learning	8 Weeks
6	D.Mamatha	NPTEL	Programming, Data Structures and Algorithms using Python	8 Weeks
7	D.Mamatha	NPTEL	Programming In JAVA	12 Weeks
8	I.V.V, Vijetha	NPTEL	Cloud Computing	12 Weeks
9	B N Ch V Chakravarthi	NPTEL	DC Grid and Control Systems	12 Weeks
10	K N S Durga Prakash	NPTEL	Electrical Measurement and Electronic Instruments	12 Weeks
11	K. Bhanupriya	NPTEL	Introduction to Operating Systems	8 Weeks
12	N.Veeraiah	NPTEL	Electrical Measurement and Electronic Instruments	12 Weeks
13	G.Suribabu	NPTEL	Electronic Systems for Cancer Diagnosis	12 Weeks
14	V S N Narasimha Raju	NPTEL	Electrical Measurement and Electronic Instruments	12 Weeks
15	P.Naveen	NPTEL	Electrical Measurement and Electronic Instruments	12 Weeks
16	K.Bhanu Priya	NPTEL	Computer Networks and Internet Protocol	12 Weeks
17	G Suri Babu	NPTEL	Electronic Systems for Cancer Diagnosis	12 Weeks

Table 5.6.3.2. List of e-sources available for teaching and learning

S. No.	Name of the e-Resources	No. of Journals	Name of the Online E-Source Package
1	IEEE	190	https://ieeexplore.ieee.org/Xplore/home.jsp
2	N-LIST	6793	https://nlist.inflibnet.ac.in/
3	DELNET		https://www.delnet.in/
4	NDLI		https://ndl.iitkgp.ac.in/



5.6.4. Vishnu Educational Development and Innovation Centre (**VEDIC) (**www.vedic.edu.in)

- The main objective of VEDIC is to Design, develop and deliver training sessions and consultations on innovative educational practices, leadership, emotional intelligence, personality development, research methods, career development etc. for faculty and students.
- Faculty has been trained on innovative teaching practices throughout the year for making teaching-learning more effective and enjoyable.

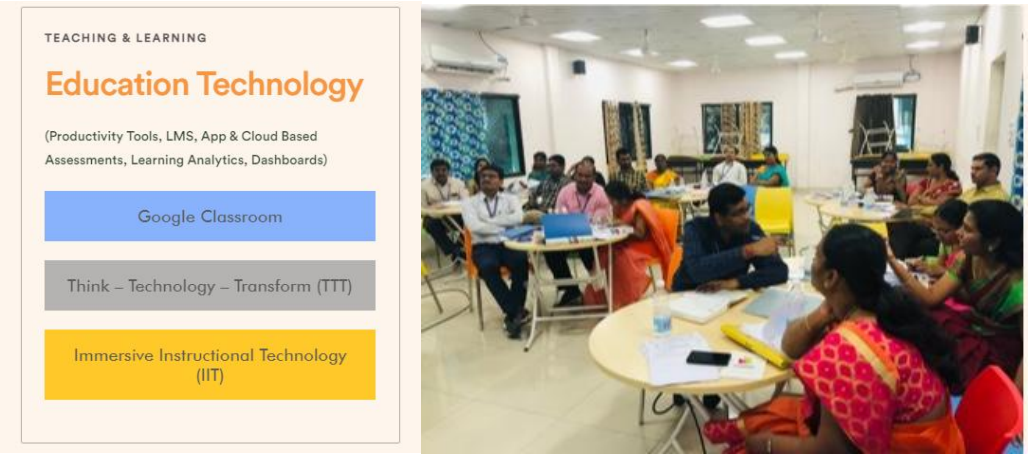


Table 5.6.4.1.List of faculty trained under VEDIC during the assessment years.

List of Faculty trained under VEDIC in 2024-2025		
S. No	**Name of the Faculty**	**Title of the Program**
1	Mr N Veeraiah	Embedded software engineering FDP
2	Ch Phani Kumar	Incorporating Fundamentals and Skills in the Core Courses
3	Ch Siva Narayana	Instructional Design and Analytics for Teaching Effectively (IDeATE) Batch 8

4	Ch Siva Narayana	VEDIC Teaching and Learning Conclave
5	Mrs K Bhanupriya	VEDIC Teaching and Learning Conclave
6	M Lavanya	Instructional Design and Analytics for Teaching Effectively (IDeATE) Batch 9 &FA
7	Dr Reddy Khasim	Instructional Design and Analytics for Teaching Effectively (IDeATE) BATCH 10 & FA
8	Ch Siva Narayana	VEDIC Teaching and Learning Conclave
9	Mr N Veeraiah	Instructional Design and Analytics for Teaching Effectively (IDeATE) BATCH 11
10	Mr G Suribabu	Course and Curriculum Design
List of Faculty trained under VEDIC in 2023-2024		
S. No	**Name of the Faculty**	**Title of the Program**
1	Mr. K N S Durga Prakash	A Hands-on workshop on Bluetooth and Device Drivers
2	Mr. N Veeraiah	A Hands-on workshop on Bluetooth and Device Drivers
3	Mr P Naveen	Faculty Induction Program
4	Smt Harika	IDEATE Workshop
5	Mr Ch Shiva Narayana	Faculty Induction Program
6	Smt K Bhanu Priya	Faculty Induction Program
7	Mr. P Ramprasad	Fuel Cells
8	Mr.N Veeraiah	Fuel Cells
9	Mr. P Ramprasad	Semiconductor Device Packing
10	Mr.N Veeraiah	Semiconductor Device Packing
11	Mr. P Ramprasad	Training on PLC and Automation
12	Mr.B N Ch V Chakravarthi	Workshop on Electrical research fundamentals, Power Electronics & EV, Real-time systems.
13	Smt.D Mamatha	Power Electronics
14	Mr.Ch Phani Kumar	Workshop on Interdisciplinary-Embedded System, Power Electronics, Solar, Fuel Cell, Battery, Semiconductor Material, AI and ML
15	Mr. N Veeraiah	Workshop on Interdisciplinary-Embedded System, Power Electronics, Solar, Fuel Cell, Battery, Semiconductor Material, AI and ML
16	Mrs K Bhanupriya	VEDIC Teaching and Learning Conclave

Visiting/Adjunct/Emeritus Faculty details:

Following is the list of visiting faculty in the department during the assessment period.

Table 5.10.1 . Details of Visiting Faculty / Industrial Experts.

S. No	Name of the Visiting Faculty/Industrial Experts	Qualification	University	Specialization	Designation and Industry	No. of hours handled by Visiting Faculty/Industrial Experts		
						2024-2025 (CAY)	2023-2024 (CAYm1)	2022-2023 (CAYm2)
1	Dr. G.Pandian	Ph.D	Bharath University, Chennai	Electronics and Control	Retd. Plant Manager - IOCL, Pondicherry	-	60	60

Application of TAPPS for Effective Identification of Misconceptions in Engineering Education

PRESENTED BY

K.N.S.DURGA PRAKASH

Assistant Professor,

EEE, VIT, Bhimavaram.

VISHNU UNIVERSAL LEARNING

VITB
Vishnu Institute of Technology
Bhimavaram
ESTD 2008

VEDIC

Name: K N S Durga Prakash

Institution: Vishnu Institute of Technology, Bhimavaram

Department: Electrical and Electronics Engineering

Title of Presentation:**Application of TAPPS for Effective Identification of Misconceptions In Engineering Education**

Subject Taught: Power Systems Analysis

Year of Student: III-II

Number of Students in Class: 65

Course Outcomes of the Subject

CO1:Students can understand the per unit quantity representation and able to develop per unit reactance diagram

CO2: Students will be able to develop Y bus and Z bus matrices of a power system network by using different techniques

CO3: Students can solve load flow problems of the interconnected power system network by using different iterative methods.

CO4: Students able to do symmetrical and unsymmetrical fault analysis.

CO5: Students able to understand the importance of power system stability

Need of Activity????

- In engineering education, most of the subjects are complex and problematic.
- Students feel difficult to handle problematic subjects.
- Students must require practice and understand the misconceptions to overcome this problem.
- TAPPS provides solution.

What is TAPPS??????

- TAPPS (Think Aloud Pair Problem Solving) is the one of the best practices in scientific education
- In TAPPS student's pair up, one in the role of problem solver and other as listener, roles will be interchanged for different problem.
- TAPPS provides great scope to solve the problems collectively by thinking and sharing their individual thoughts

Implementation of Activity

Form the student batches (2 or 3 per batch)

Give different problems on selected topic

Allow the students to solve the problems

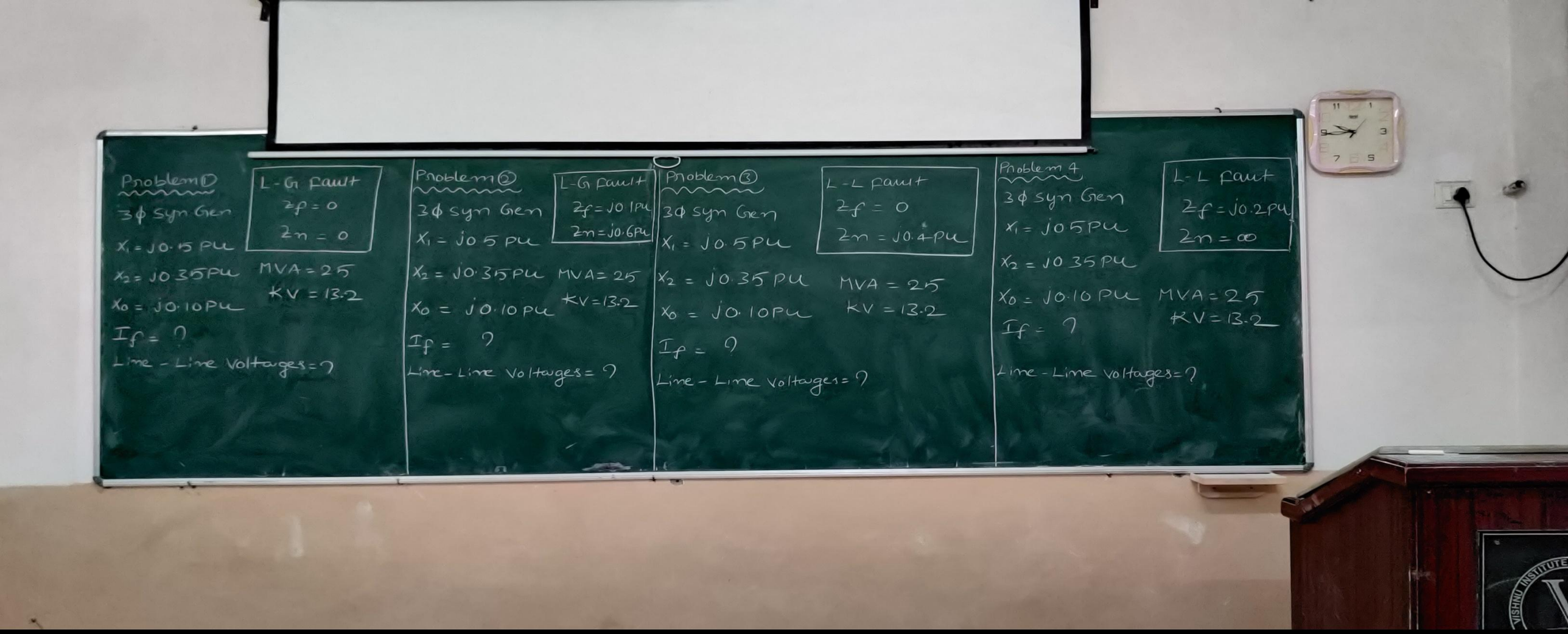
Monitor the student groups closely, how they are doing, identify the difficulties facing and prepare the activity report

List out the observations and misconceptions from the activity report

Take the remedial action

Activity details

- Name of The Subject: Power Systems Analysis
- Year & Branch: III-II &EEE-A
- Topic: Unsymmetrical fault analysis of unloaded synchronous generator
- Name of the Activity: **Application of TAPPS for Effective Identification of Misconceptions In Engineering Education**
- No of students involved in activity: 54
- No of Batches:21
- Students per batch: 2 or 3
- Duration of activity: 50 Minutes



Different Model Problems on Selected Topic

Student Batches are doing Problems

Monitoring the Student Batches

Making Report on Observations

Summary of Activity Report

Batch 5,8,19	• Student batches feeling difficult to write the fault conditions.
Batch 10,12 and 18	• Student batches feeling difficult to calculate the zero sequence impedance.
Batch 3	• Feeling difficult to convert per unit value to actual vales.
Batch 1,13	• Calculations errors
Batch 8 & Batch 16	• Students feeling difficult to draw the sequence impedance networks

Misconceptions

Confusion in considering fault conditions between with fault impedance and without fault impedance

Students ignoring neutral impedance effect while calculating zero sequence impedance

Students doing mistakes in the selection of base values

Students doing mistakes in calculations because of complex notations

Students confusing between L-G fault sequence networks and L-L fault sequence network

Remedial actions

- Addressing Misconceptions clearly
- Conducting Tutorials
- Giving Assignments
- Conducting Slip Tests

Impact of Activity after Remedial Actions

% of Students Performing Well (B R)	% of Students Performing Well (A R)
50%	81.48%

References

- Application of Think-Aloud Pair Problem Solving in the Diagnosis of Student Misconceptions in a Materials Science and Engineering Course" by J. H. Lee, G. Lee, and S. A. Wender, published in the Journal of Materials Education in 2019.
- Applications of Think-Aloud Pair Problem Solving in Engineering Education: A Review of Recent Studies" by J. Atadero, J. Lin, and R. M. Reiff, published in the Journal of Engineering Education in 2020.

Thank you!!

Teaching Circuit Concepts Using Evidence-based Instructional Approaches

PRESENTED BY

P.RAM PRASAD

Associate Professor,

EEE, VIT, Bhimavaram.

VISHNU UNIVERSAL LEARNING

VITB
Vishnu Institute of Technology
Bhimavaram
ESTD 2008

VEDIC

Name: P.RAM PRASAD

Institution: Vishnu Institute of Technology, Bhimavaram

Department: Electrical and Electronics Engineering

Title of Presentation:Teaching Circuit Concepts Using Evidence-based Instructional Approaches

Subject Taught: Network Analysis and Electrical Technology

Year of Student: I-II

Number of Students in Class: 66

Need of Activity????

- In engineering education, most of the subjects are complex and problematic.
- Students feel difficult to learn problematic subjects like circuits
- Students require self motivation and critical thinking to overcome this problem
- Usage of mobile based simulation applications can help to increase their interest .

What is evidence-based approach

- Evidence based education is one of the best practices in teaching circuits concepts.
- In this approach students are asked to install circuit simulators in their cell phones.
- Simulation of an electrical circuit using a mobile app creates curiosity in students to solve problems on their own by thinking and sharing their individual thoughts

Implementation of Activity

Form the student batches (2 or 3 per batch)(bench mates)

Give different problems on selected topic

Allow the students to solve the problems

Monitor the student groups closely, how they are doing, what are the difficulties facing and make the activity report

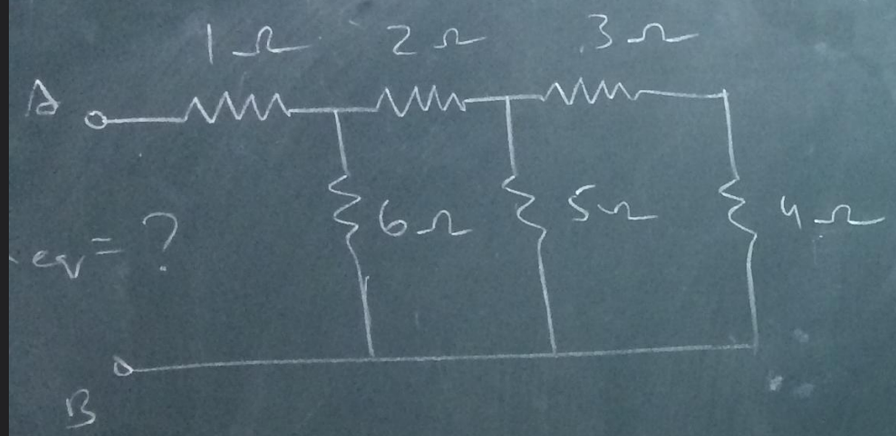
List out the observations and misconceptions from the activity report

Take the remedial action

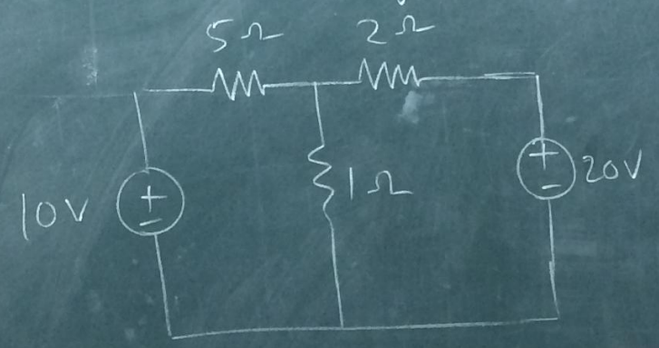
Activity details

- Name of The Subject: Network Analysis and Electrical Technology
- Year & Branch: I-II & ECE-A
- Topic: Mesh Current analysis method to find Mesh Currents.
- Name of the Activity: **usage of mobile simulators to solve circuit problems**
- No of students involved in activity: 60
- No of Batches:20
- Students per batch: 3 or 4
- Duration of activity: 30 Minutes

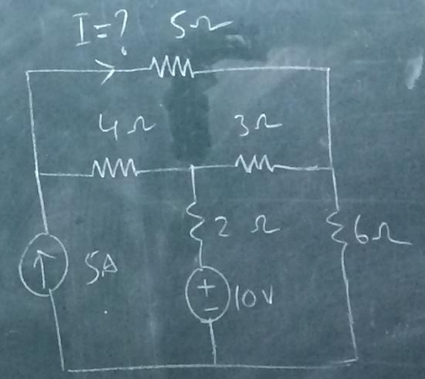
Find equalant resistance (R_{eq})



② Find current through all branches



③ Find I using mesh Analysis



Different Model Problems on Selected Topic

Students are doing Problems

Monitoring the Student Batches

Sl.N.O	Batch Number	Student roll number	Problem number	remarks
1	Batch-1	21PA1A0461, 21PA1A0404, 21PA1A0462	1	Students finding difficulty solving equations
2	Batch-2	21PA1A0414, 21PA1A0453, 21PA1A0451	2	Facing difficulty in writing polarities for voltage drops
3	Batch-3	21PA1A0458, 21PA1A0456, 21PA1A0449	3	Solving in proper way
4	Batch-4	21PA1A0410, 21PA1A0437, 21PA1A0460	1	Finding difficulty in assigning directions for loop currents
5	Batch-5	21PA1A0424, 21PA1A0442, 21PA1A0422	2	Students finding difficulty solving equations
6	Batch-6	21PA1A0412, 21PA1A0452, 21PA1A0446	3	Solving in proper way
7	Batch-7	21PA1A0447, 21PA1A0434, 21PA1A0462	1	Finding difficulty in assigning directions for loop currents
8	Batch-8	21PA1A0443, 21PA1A0408, 21PA1A0416	2	Facing difficulty in writing polarities for voltage drops
9	Batch-9	21PA1A0432, 21PA1A0445, 21PA1A0438	3	Students finding difficulty solving equations
10	Batch-10	21PA1A0463, 21PA1A0448, 21PA1A0459	1	Finding difficulty in assigning directions for loop currents
11	Batch-11	21PA1A0425, 21PA1A0415, 21PA1A0440	2	Solving in proper way
12	Batch-12	21PA1A0402, 21PA1A0433, 21PA1A0411	3	Facing difficulty in writing polarities for voltage drops
13	Batch-13	21PA1A0429, 21PA1A0431, 21PA1A0454	1	Solving in proper way
14	Batch-14	21PA1A0430, 21PA1A0423, 21PA1A0413	2	Finding difficulty in assigning directions for loop currents
15	Batch-15	21PA1A0407, 21PA1A0420, 21PA1A0450	3	Students finding difficulty solving equations
16	Batch-16	21PA1A0409, 21PA1A0426, 21PA1A0439	1	Finding difficulty in assigning directions for loop currents
17	Batch-17	21PA1A0417, 21PA1A0401, 21PA1A0403	2	Solving in proper way
18	Batch-18	21PA1A0405, 21PA1A0406, 21PA1A0410	3	Facing difficulty in writing polarities for voltage drops
19	Batch-19	21PA1A0413, 21PA1A0418, 21PA1A0421	1	Solving in proper way
20	Batch-20	21PA1A0424, 21PA1A0427,	2	Students finding difficulty solving equations

Activity Report

Summary of Activity Report

Batch- 2,8,12,18	• Facing difficulty in writing polarities for voltage drops
Batch- 4,7,10,14,16	• Finding difficulty in assigning directions for loop currents
Batch-1,5,9,15,20	• Students finding difficulty solving equations

Where they went wrong ?

Confusion between polarities of voltage drops and polarities of source voltage.

Students ignoring the importance of direction of current through an element

Students doing mistakes in assigning loop current directions in accordance with current direction given in the problem

Students doing mistakes in calculations.

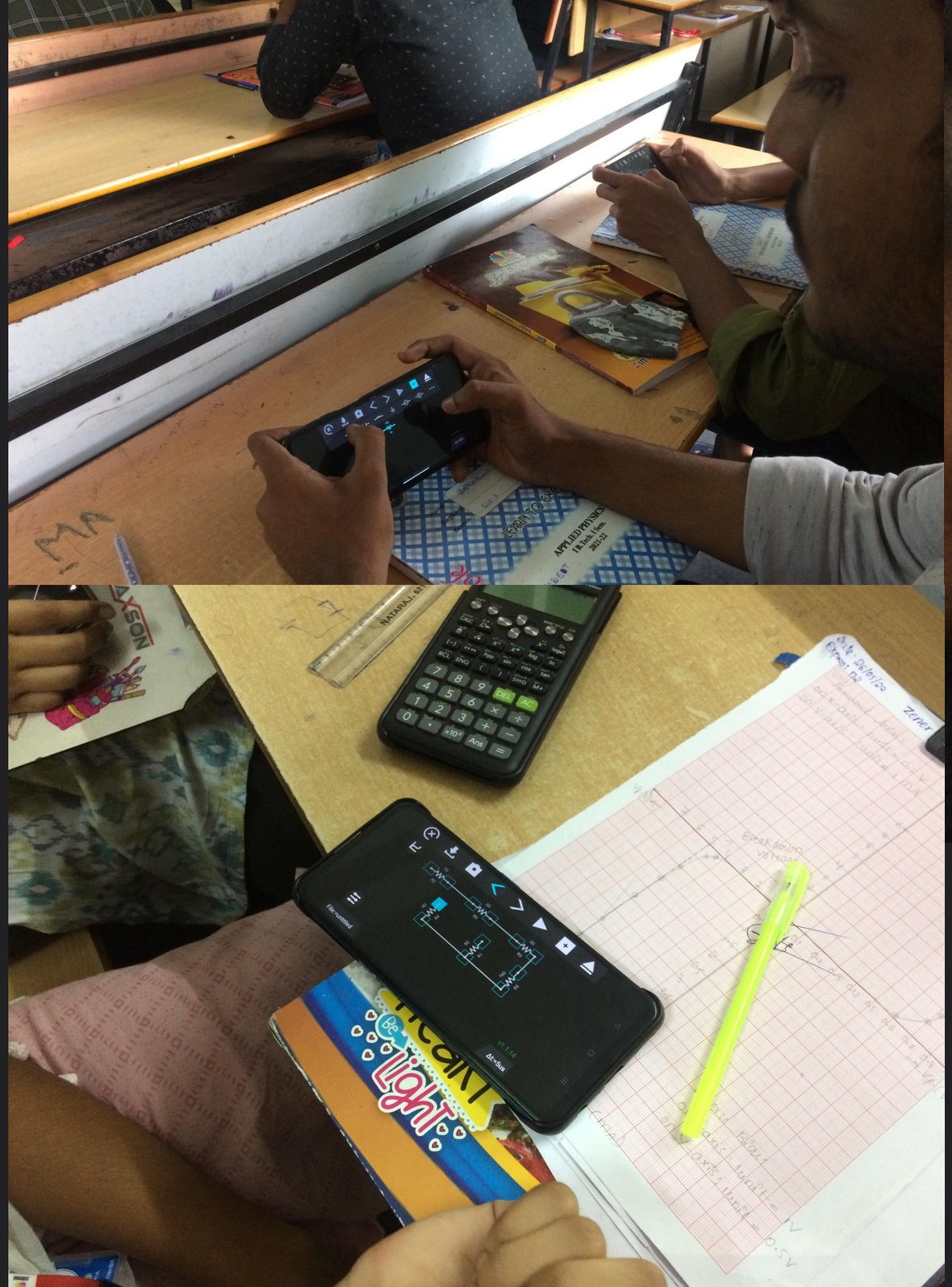
What is the Solution???

Addressing Misconceptions Clearly

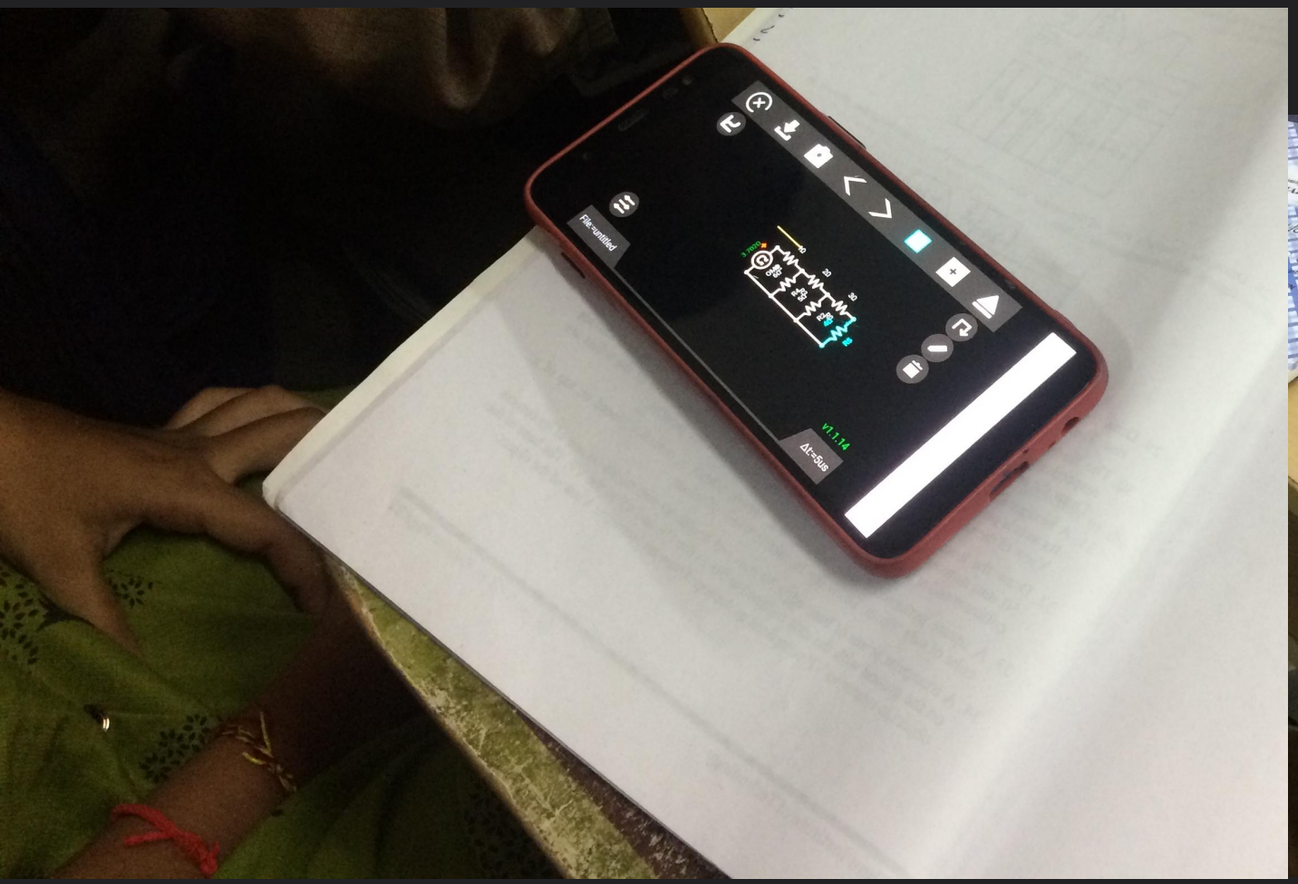
Introducing about the usage of circuit simulators

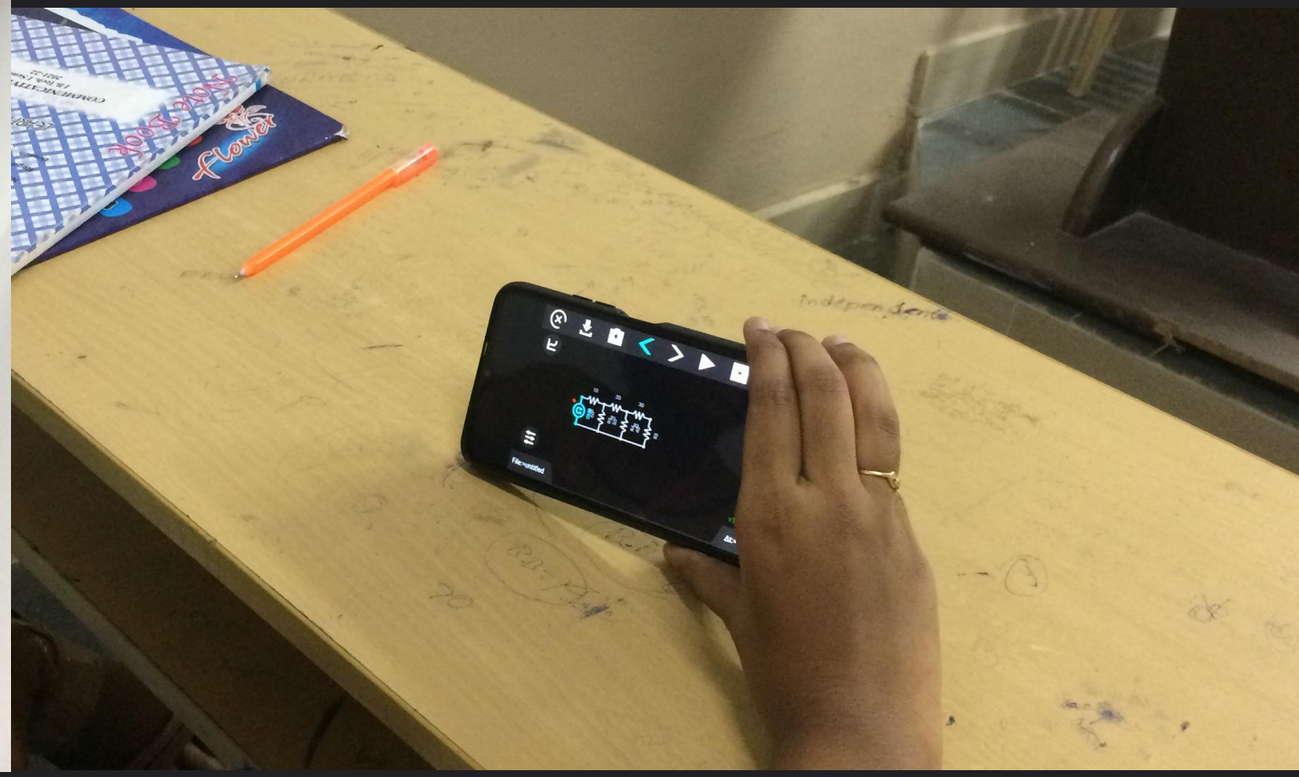
Giving Assignments and asking them to solve the numerical problems using circuit simulators and also using normal methods.

Conducting Slip Tests



Students using mobile circuit simulator to solve problems





Various responses like current through and voltage across an element can be found using simulators

Students can find responses quickly using simulators

They can compare the responses Obtained through manual calculations

They can get evidence-based understanding in less time and can try new problems to increase their understanding

Impact of Activity after Remedial Actions

Sl.N.O	List of students feeling difficult to solve problems before the activity	List of students doing good after the Activity
1	21PA1A0461, 21PA1A0404, 21PA1A0462	21PA1A0404, 21PA1A0462
2	21PA1A0414, 21PA1A0453, 21PA1A0451	21PA1A0414, 21PA1A0453,
3	21PA1A0410, 21PA1A0437, 21PA1A0460	21PA1A0410, 21PA1A0437, 21PA1A0460
4	21PA1A0424, 21PA1A0442, 21PA1A0422	21PA1A0424, 21PA1A0442,
5	21PA1A0447, 21PA1A0434, 21PA1A0462	21PA1A0447
6	21PA1A0443, 21PA1A0408, 21PA1A0416	21PA1A0408, 21PA1A0416
7	21PA1A0432, 21PA1A0445, 21PA1A0438	21PA1A0432, 21PA1A0445
8	21PA1A0463, 21PA1A0448, 21PA1A0459	21PA1A0463
9	21PA1A0402, 21PA1A0433, 21PA1A0411	21PA1A0402, 21PA1A0433,
10	21PA1A0430, 21PA1A0423, 21PA1A0413	21PA1A0430, 21PA1A0423,
11	21PA1A0407, 21PA1A0420, 21PA1A0450	21PA1A0407, 21PA1A0450
12	21PA1A0409, 21PA1A0426, 21PA1A0439	21PA1A0426, 21PA1A0439
13	21PA1A0405, 21PA1A0406, 21PA1A0410	21PA1A0405, 21PA1A0406, 21PA1A0410
14	21PA1A0424, 21PA1A0427, 21PA1A0435	21PA1A0427, 21PA1A0435

Impact of Activity after remedial actions

SI.No	% Students doing good (before using simulator)	% Students doing good (After using simulator)
1	40%	78.78%

THANK YOU

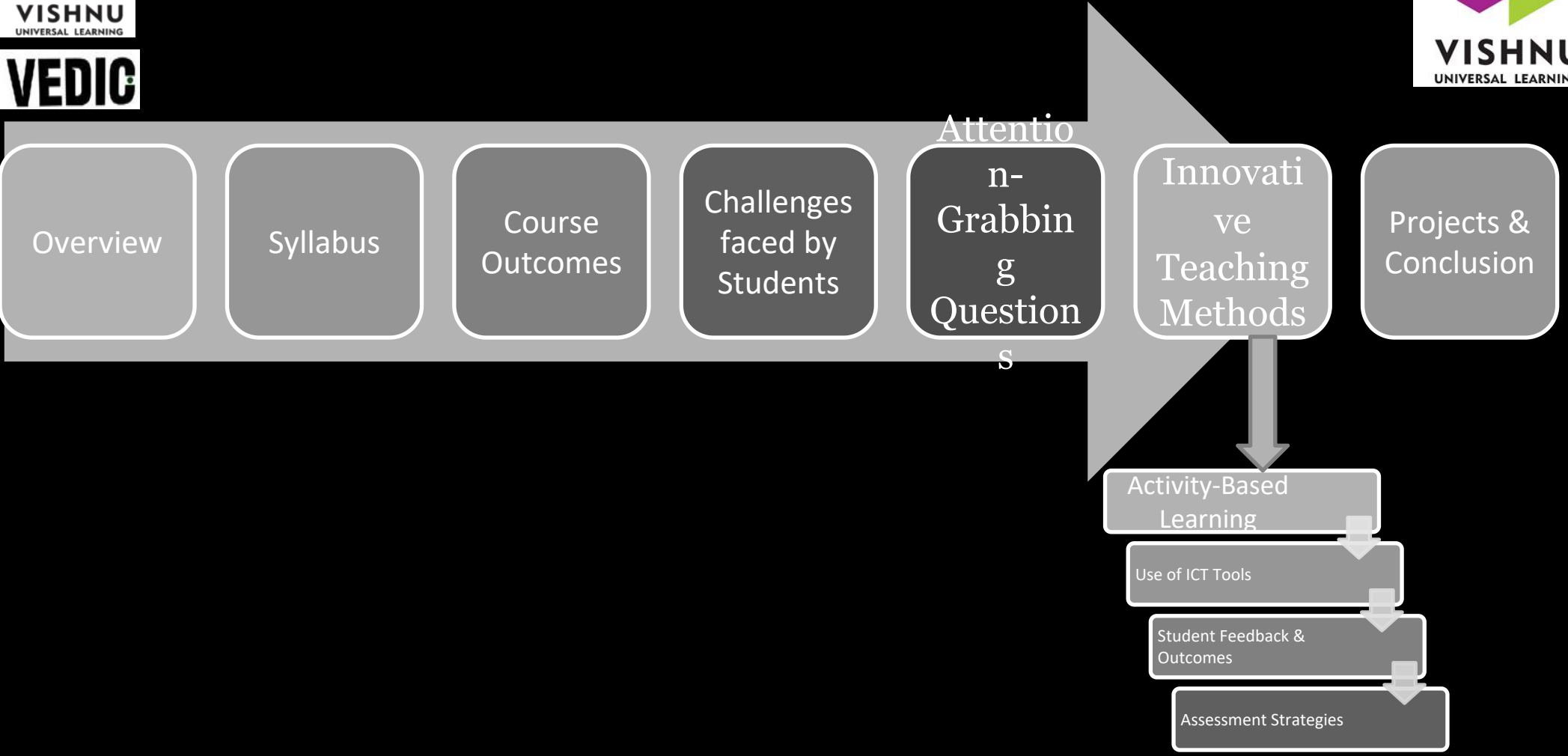
INNOVATIVE TEACHING PRACTICES IN "DESIGN THINKING AND INNOVATION"

DR. S. REDDI KHASIM
VISHNU INSTITUTE OF TECHNOLOGY, BHIMAVARAM
EEE

Information Sheet

- Name: Dr. S. Reddi Khasim
- Institution: Vishnu Institute of Technology, Bhimavaram
- Department: EEE
- Title of Presentation:Innovative Teaching Practices in “Design Thinking and Innovation”
- Subject Taught : Design Thinking and Innovation
- Year and Semester of Course Offering (e.g., I Year- II Sem): II-Year, II-SEM
- Number of Students in Class: 71

Outline of the Presentation



Course Information

- **Name of the Subject:** Design Thinking and Innovation (23ME4P03)
- **Course:** II-B.Tech, II-Sem
- **Academic Year:** 2024-2025
- **Departments:** EEE & IT-D
- **Total no. of Students:** 69 (EEE) + 70 (IT-D) = 139
- **Nature of Course:** Interdisciplinary, skill and application-oriented
- **Objective:** To nurture a problem-solving mindset and encourage innovation

Overview of the Course

Focus: *Understanding Design Thinking Principles & Innovation*

Importance of the Course:

•Introduces fundamental elements of design thinking rules

•Explores the history and evolution of design thinking.

•Highlights the role of new materials and their applications in industry.

Additional Skills Developed:

•Applies design thinking process: empathize, analyze, ideate, prototype.

•Enables problem-solving through social innovation and invention-driven approaches.

•Develops tools like persona creation, customer journey mapping, brainstorming, and product development.

•Encourages innovation by distinguishing between creativity and innovation, and fostering teamwork.

•Applies design thinking in business contexts: strategic innovation, startup ecosystems, business model testing, and prototype development.

Course Outcomes

- Apply the design thinking techniques for solving problems in various sectors. (L3)- **Apply**
- Analyse to work in a multidisciplinary environment. (L4)- **Analyze**
- Evaluate the value of creativity. (L5)- **Evaluate**

Challenges faced by Students

- Difficulty in ideating without real-world examples
- Confusion in formulating “Problem Statement”
- Initial resistance to brainstorming or divergent thinking
- Hesitation in group activities or presentations

Attention-Grabbing Questions

- “How would you redesign your classroom experience?”
- “What frustrates you in your day-to-day life — and how would you solve it?”
- “Can an EEE/IT student be a designer?”
- “Why did Nokia fail despite being a top player?”

Innovative Teaching Methods

Method	Purpose
Role Play	User Empathy in defining problem statements
Muddiest Point	Clarify confusing stages like 'Ideate' or 'Prototype'
Peer Learning	Collaborative idea generation
Real-Time Experience	Field problems (e.g., campus issues) as mini-projects
Mind Maps	Understanding the design cycle stages

Activity-Based Learning

- **Empathy Mapping Exercise:** Interview-based activity
- **Storyboard Challenge:** Visual storytelling of a user's experience
- **Design Sprint (Mini):** Ideate, Sketch, Decide in 1-hour session
- **Paper Prototypes:** Created and evaluated by peer groups
- SCAMPER, Brainstorming & Mindmapping Techniques

Use of ICT Tools

- **Canva:** Prototyping tools
- **MATLAB**: Simulation of circuits
- **Pspice Orcad:** Design of circuits
- **Google web designer**: Website design
- **Online Forms:** For feedback and peer assessment

Student Feedback & Outcomes

- Positive response to interactive sessions
- Increased interest in formulation of problem statement and problem-solving
- Enhanced participation in real time project work and presentation
- Improvement in communication and collaboration skills

Assessment Strategies

- Continuous Internal Evaluation (Assignments, Activities, MID exams)
- Mini-project evaluation
- Poster presentation scores
- Surprise JAMs based on current design ideas
- Peer reviewed journal publications
- Patent Publications

Projects & Activities

Group Activities





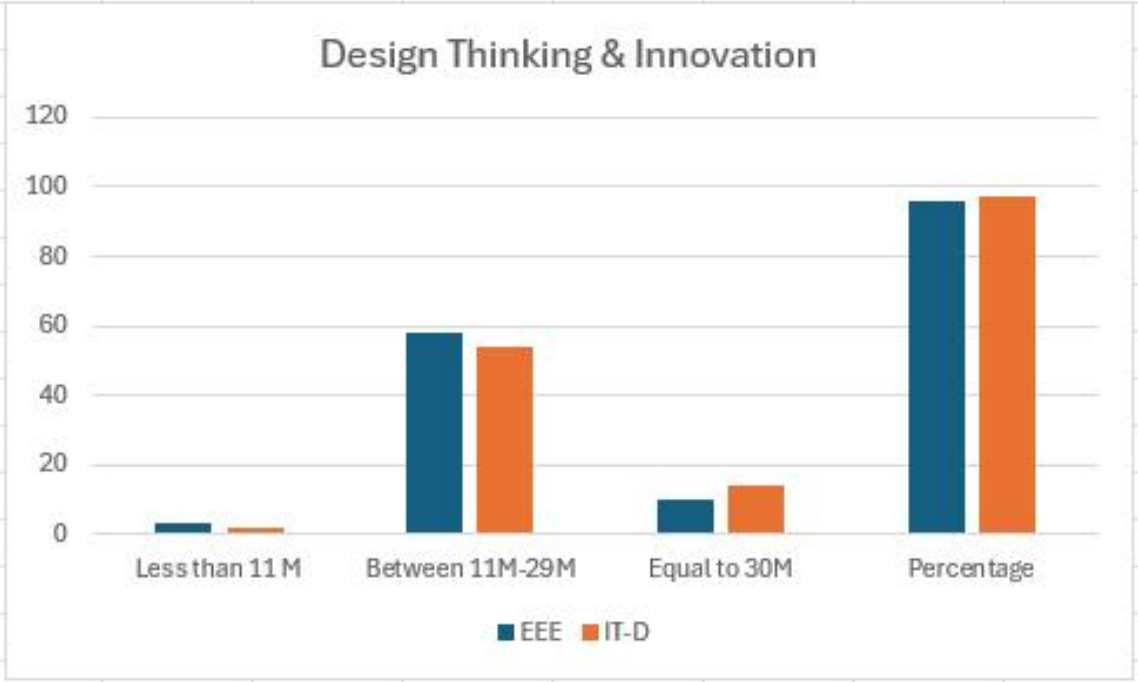



Group Activities

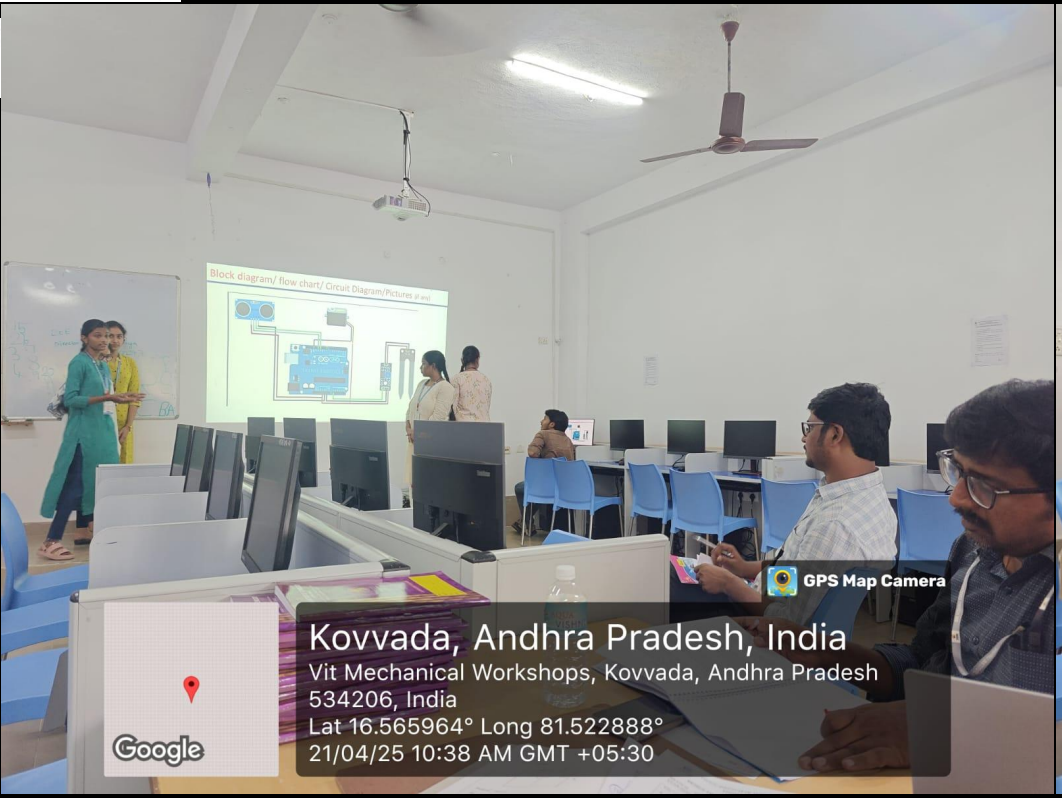
Group Activities

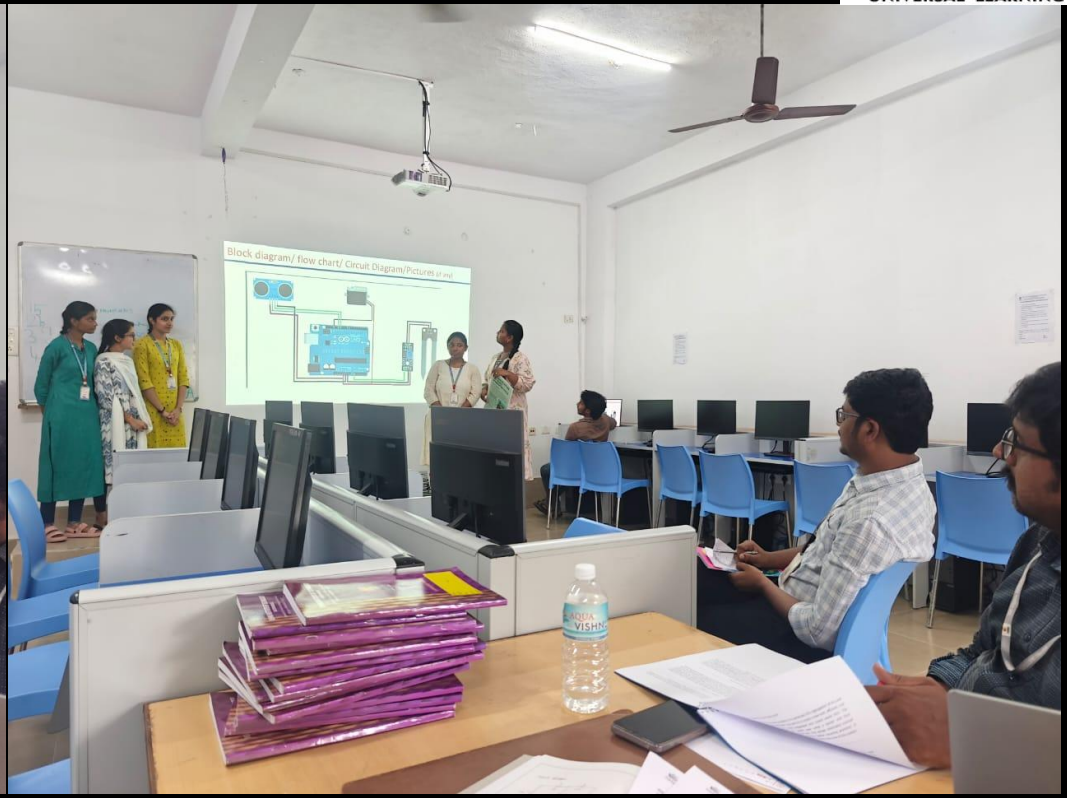
DTI-Internal Evaluation-1

Marks	EEE	IT-D
Less than 11 M	3	2
Between 11M-29M	58	54
Equal to 30M	10	14
Percentage	95.7	97.14



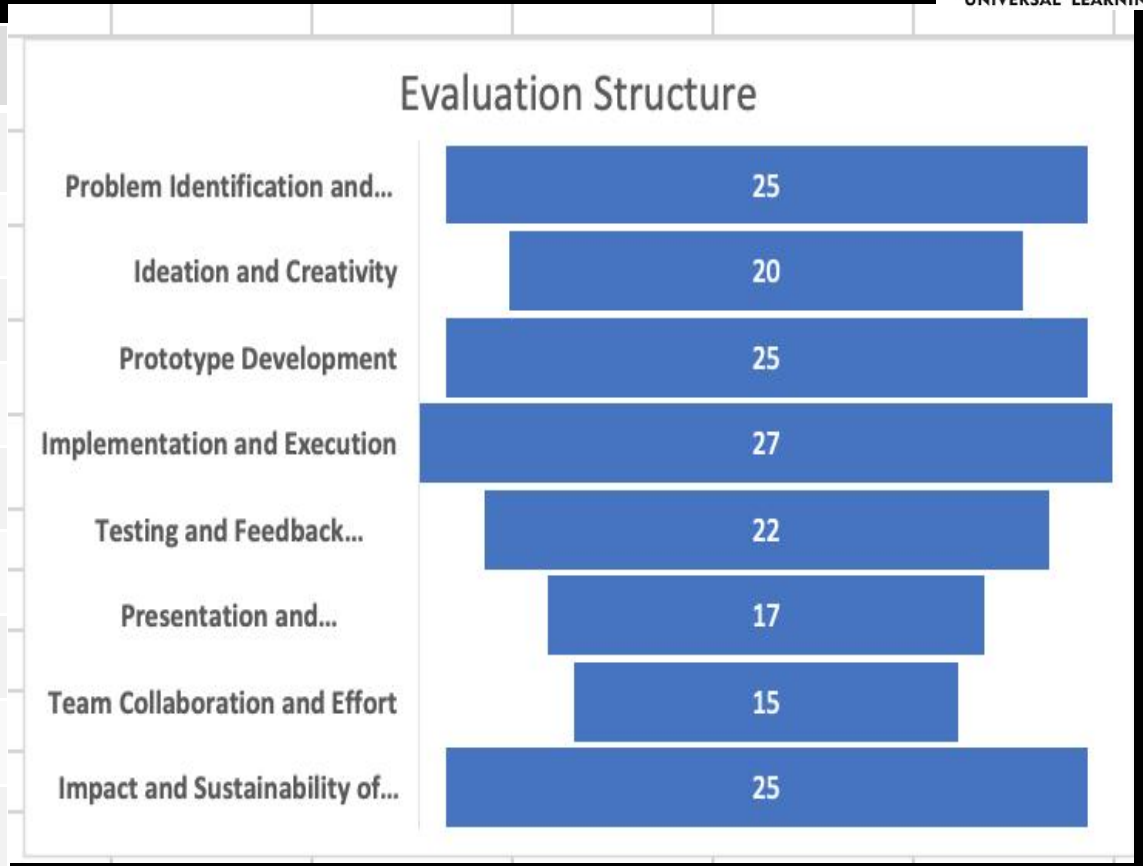
DTI-External Evaluation





DTI- Evaluation Rubrics

S. No.	Evaluation Parameter	Marks
1	Problem Identification and Empathy	10
2	Ideation and Creativity	10
3	Prototype Development	15
4	Implementation and Execution	10
5	Testing and Feedback Integration	10
6	Presentation and Communication Skills	5
7	Team Collaboration and Effort	5
8	Impact and Sustainability of the Solution	5
	Total	**70**



DTI-External Evaluation

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BHIMAVARAM-534202

2024-2025

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISHNU
UNIVERSAL LEARNING

CERTIFICATE

This is to certify that the project entitled **YAN - EEE CROSSWORD PUZZLE** is being submitted by ***N. YASHASWINI NAGA SRI, P. LAKSHMI NAVYA, R. M. S. AVANTHI,*** bearing the **REGD. NOS: 23PA1A0244, 23PA1A0251** and 23PA1A0255 submitted in fulfilment for the course **DESIGN THINKING AND INNOVATION** in **ELECTRICAL AND ELECTRONICS ENGINEERING** is a record of Bonafide work carried out by them under my guidance and supervision during the academic year 2024-2025 and it has been found worthy of acceptance according to the requirements of university.

Internal Guide/Course Instructor

Dr. S. Reddi Khasim

External Examiner

21/04/2025

Head of the Department

Dr. RVD Rama Rao
Head of the Department
Electrical & Electronics Engineering
Vishnu Institute of Technology (Autonomous)
Vishnupur, BHIMAVARAM-534 202, A.P.

VISHNU INSTITUTE OF TECHNOLOGY

(Autonomous)

(Approved by AICTE, Accredited by NBA & NAAC and permanently affiliated to JNTU Kakinada)

BHIMAVARAM-534202

2024-2025

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISHNU
UNIVERSAL LEARNING

CERTIFICATE

This is to certify that the project entitled **"Automated dry and wet waste segregation"** is being submitted by **CH.Bhavya Durga Sri,K.Malleswari,K.Sai Suvarna,N.Naga Harathi,R.Rishitha Siva Ganga,**bearing the **REGD. NOS: 23PA1A0212,23PA1A0231,23PA1A0233,23PA1A0245,23PA1A0256** submitted in fulfilment for the course **DESIGN THINKING AND INNOVATION** in **ELECTRICAL AND ELECTRONICS ENGINEERING** is a record of Bonafide work carried out by them under my guidance and supervision during the academic year 2024-2025 and it has been found worthy of acceptance according to the requirements of university.

Internal Guide/Course Instructor

Dr. S. Reddi Khasim

External Examiner

21/04/2025

Head of the Department

Dr. RVD Rama Rao
Head of the Department
Electrical & Electronics Engineering
Vishnu Institute of Technology (Autonomous)
Vishnupur, BHIMAVARAM-534 202, A.P.

Journal-Publications

An Efficient PWM-Based Speed Control Method for BLDC Motors in Electric Vehicles

Shaik Reddi Khasim[1]*, Manikala Anusha[2], Tammineni Divya[3], Chikkala Pradeep Kumar[4], Molla Rayis Sadaq[5], Idamakanti Kasireddy[6], N Sudhakar Reddy[7]
[123456]Department of Electrical and Electronics Engineering, Vishnu Institute of Technology, Bhimavaram, Andhra Pradesh, India-534202
[7]Department of ECE, Mohan Babu University, Tirupati, Andhra Pradesh - 517102
*E-mail: reddikhasim.s@vishnu.edu.in

Abstract. In development of motor drives the key features are Efficiency and Reliability. Traditional motor drive technologies are utilized in household and commercial appliances like ovens, air conditioners and refrigerators. Brushless DC (BLDC) motor drives are notable for their enhanced efficiency, reduced maintenance requirements, and higher costs. Consequently, the need arises for an economical yet efficient Brush Less DC motor controller. Pulse Width technique is widely adopted in power converting control, providing commonly a powerful technique for the straightforward management of a systems via digital processor outputs. BLDC motors mitigate numerous issues associated with brush DC motors, have been extensively employed across various sectors. Developing a control system for BLDC motor demands reliable operation, exceptional control algorithm, cost efficiency, small development cycle. This paper introduces strategy for a speed control method in BLDC motors in EVs, leveraging digital controllers to increase the drive system's flexibility.

1. Introduction

The device which transforms electrical power into mechanical power is called an electric motor. Electric motors play a crucial role in industrial facilities [1]. In residential and commercial settings, conventional motor drive technologies are predominantly employed. Electric motors account for over fifty percent of global electrical energy consumption. Within various industries, processes often necessitate adjustments to maintain optimal speeds. These adjustments are typically achieved through variable speed drives, which comprise an electric motor, a power converter, and a controller [2]. Commonly, appliances utilize single phase induction motors or DC motors with brushes, specified by distinct inefficiencies and maintenance demands. Single phase induction motors exhibit lower efficiency due to ohmic losses and the phase angle displacement in between the stator current and the back electromotive force (EMF). In contrast, brushless DC (BLDC) motors experience reduced losses due to the elimination of mechanical commutation and brushes [3]. Several methods exist for controlling the BLDC motor's speed, including DC variable voltage and pulse-width modulation (PWM) techniques. Contemporary PWM techniques encompass sinusoidal, multiple sinusoidal, and 60-degree modulation, among others.

Two proposed models are for to the speed controlling of a Permanent Magnet Brushless DC (PMBLDC) Motor utilizing pulse-width modulation (PWM) techniques are outlined. The first model employs a PWM-controlled buck converter to reduce the DC source voltage to the

Design of Bidirectional Buck Boost And Flyback and Sepic Combined Converters And Battery Controller of Plug in Electric Vehicles

Sk Reddi Khasim[1], Ch Phani kumar[1*], L Uday Narasimha[1], G Nishma[1],K Lakshmi Prasanna[1], A Chaitanya Naga Durga Ganesh[1], N Bhanu Priya[1], I.Kasireddy[1]

[1]Electrical and Electronics Engineering, Vishnu Institute of Technology, Bhimavaram, India – 534202,

*E-mail: phani207@gmail.com.

Abstract. The greater focus on sustainability and pollution reduction has led to notable advancements in plug-in hybrid electric cars (PHEVs) along with electric cars (EVs). A critical aspect of EV technology is the efficiency and reliability of motor drives and power electronic systems. This document offers an extensive examination of different DC-DC converters, including bidirectional Buck-Boost, Flyback, SEPIC, and a combined SEPIC-Flyback converter, which are crucial for efficient energy management in EVs. These converters are integral to battery management systems, ensuring optimal voltage levels and stable operation. The design and simulation of these converters are discussed, highlighting their applications in EVs and battery charging systems. Additionally, the paper introduces a battery controller implementing constant current and constant voltage charging strategies, supported by simulation findings that show how well these converters work in applications for electric vehicles. The results highlight Why DC-DC converters are important for future automotive advancements as well as their contribution to the advancement of EV technology.

1. Introduction

Today, the world is increasingly focused on sustainable development, particularly in reducing pollution and adopting cleaner energy production and consumption methods. The automobile sector, a significant contributor to air pollution, has made substantial strides toward sustainability. Electric automobiles (EVs) and plug-in hybrid electric cars (PHEVs) are becoming more and more popular worldwide, leading the industry into a new era of environmental sustainability. Every year, new models of cars, bikes, scooters, and auto-rickshaws enter the EV market, showcasing innovative and efficient designs. However, the rapid increase in EV adoption necessitates the establishment of more battery charging stations, predominantly installed in residential and commercial areas. [1- 2]

As the number of EVs rises, manufacturers and researchers are continually exploring ways to enhance vehicle efficiency. Key focus areas include battery management systems (BMS), power electronic interfaces, and charging technologies. Modern BMS not only encompass voltage, current, and temperature measurement techniques but also integrate cell balancing and state-of-charge indications. By modifying voltage levels to satisfy operating needs, DC-DC

Best paper Award

ICSSES 2025
VISHNU INSTITUTE OF TECHNOLOGY
(AUTONOMOUS)
BHIMAVARAM, ANDHRA PRADESH, INDIA

2nd INTERNATIONAL CONFERENCE
ON
SMART & SUSTAINABLE
ENERGY SYSTEMS
14-15 March 2025

IOP Conference Series
Earth and Environmental Science
ICSSES 109

CERTIFICATE OF PRESENTATION

This is to certify that Shaik Reddi Khasim, Manikala Anusha, Tammineni Divya, Chikkala Pradeep Kumar, Molla Rayis Sadaq, Idamakanti Kasireddy, N Sudhakar Reddy, M. Lavanya have successfully presented the paper entitled "AN EFFICIENT PWM-BASED SPEED CONTROL METHOD FOR BLDC MOTORS IN ELECTRIC VEHICLES" at the 2nd International Conference on Smart and Sustainable Energy Systems (ICSSES 2025) Organized by the Department of Electrical & Electronics Engineering, Vishnu Institute of Technology (A), Bhimavaram, Andhra Pradesh, India during 14-15 March 2025.

Dr. I Kasireddy	Dr. S. Reddi Khasim	Dr. RVD Rama Rao	Dr. M Venu
CONVENER	CONVENER	ORGANIZING CHAIR	PRINCIPAL

Advancing innovation and research for a cleaner, more sustainable energy future.

Patent-Publications

(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :29/01/2025
(21) Application No.202541007270 A
(43) Publication Date : 07/02/2025

(54) Title of the invention : An Efficient PWM-Based Speed Control Method for PMBLDC Motors in Electric Vehicles

(51) International classification :H02P6/00, B60L15/20, H02P27/08
(86) International Application No :NA
Filing Date :NA
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(71)**Name of Applicant :**
1)VISHNU INSTITUTE OF TECHNOLOGY, BHIMAVARAM
Address of Applicant :VISHNUPUR, KOVVADA, BHIMAVARAM, WEST GODAVARI DISTRICT, ANDHRA PRADESH Bhimavaram ---------- ----------
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)M. Anusha
Address of Applicant :UG Student, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram, West Godavari District Andhra Pradesh Bhimavaram ---------- ----------
2)T. Divya
Address of Applicant :UG Student, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram, West Godavari District Andhra Pradesh Bhimavaram ---------- ----------
3)Dr. Reddi Khasim Shaik
Address of Applicant :Associate Professor Dept. of EEE, Vishnu Institute of Technology, Bhimavaram, West Godavari District Andhra Pradesh Bhimavaram ---------- ----------
4)Ch. Pradeep Kumar
Address of Applicant :UG Student, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram, West Godavari District Andhra Pradesh Bhimavaram ---------- ----------
5)Dr. Idamakanti Kasireddy
Address of Applicant :Associate Professor Dept. of EEE, Vishnu Institute of Technology, Bhimavaram, West Godavari District Andhra Pradesh Bhimavaram ---------- ----------

(57) Abstract :
In development of motor drives the key features are Efficiency and Reliability. Traditional motor drive technologies are commonly utilized in household and commercial appliances like ovens, air conditioners and refrigerators. Brushless DC (BLDC) motor drives are notable for their enhanced efficiency, reduced maintenance requirements, and higher costs. Consequently, the need arises for an economical yet efficient Brush Less DC motor controller. Pulse Width technique is widely adopted in power converting control, providing a powerful technique for the straightforward management of a systems via digital processor outputs. BLDC motors mitigate numerous issues associated with brush DC motors, have been extensively employed across various sectors. Developing a control system for BLDC motor demands reliable operation, exceptional control algorithm, cost efficiency, small development cycle. This paper introduces strategy for a speed control method in BLDC motors in EVs, leveraging digital controllers to increase the drive system's flexibility.

No. of Pages : 8 No. of Claims : 5

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(54) Title of the invention : A MULTIPORT DUAL INPUT-DUAL OUTPUT CONVERTER FOR ELECTRIC VEHICLE APPLICATIONS

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(71)**Name of Applicant :**
1)VISHNU INSTITUTE OF TECHNOLOGY, BHIMAVARAM
Address of Applicant :VISHNUPUR, KOVVADA, BHIMAVARAM Bhimavaram ---------- ----------
Name of Applicant : NA
Address of Applicant : NA
(72)**Name of Inventor :**
1)Dr. Reddi Khasim Shaik
Address of Applicant :Associate Professor, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram Bhimavaram ---------- ----------
2)Dr. Idamakanti Kasireddy
Address of Applicant :Associate Professor, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram Bhimavaram ---------- ----------
3)Mr. P. Naveen
Address of Applicant :Associate Professor, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram Bhimavaram ---------- ----------
4)Dr. R.V.D Rama Rao
Address of Applicant :Associate Professor, Dept. of EEE, Vishnu Institute of Technology, Bhimavaram Bhimavaram ---------- ----------

(57) Abstract :
This work presents a non-isolated multi-port power converter feasible to hybridize energy alternatives in electric vehicles. Due to the hybridization of the various input sources, there are several advantages in load power distribution in the system. Flexible control of discharging as well as the charging process concerning the energy sources can be achieved. The developed converter can able to boost the voltage levels by with dual inputs such as a renewable solar PV and the other input as a battery and provides dual outputs with various voltage levels, which can able to suit the converter fed for several loads like motor drive and the low rated loads like lighting and other auxiliary supplies in electric vehicles. Also, as the various voltages appear at the output, this converter can be interfaced with multilevel inverters fed electric vehicle drivetrain. The utilization of multilevel inverters reduces the total harmonic distortion and torque ripples in the motor drives in electric vehicles. The proposed converter consists of less number of components making the circuit simple and cost-effective.

No. of Pages : 7 No. of Claims : 5


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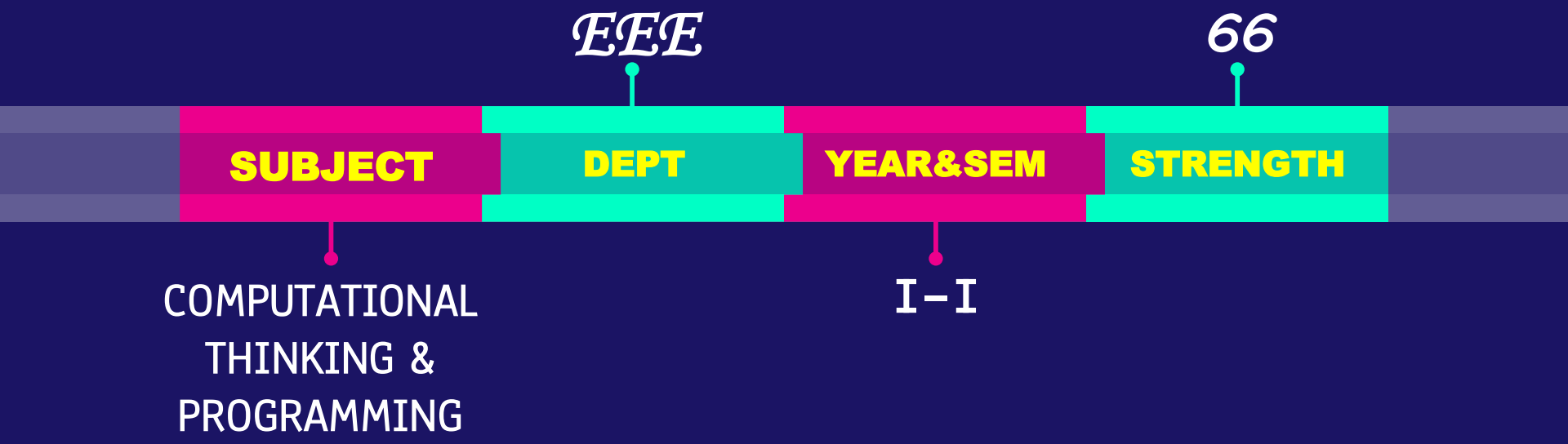
VEDIC

INNOVATIVE TEACHING PRACTICES

Presented by
D.Mamatha
Assistant professor, EEE

VISHNU
VITB
Vishnu Institute of Technology
Bhimavaram
ESTD 2008

SUBJECT & CLASS DETAILS



COURSE CONTENT

01

KNOWING THE COMPUTER

02

INTRODUCTION TO PYTHON

03

PROGRAMMING IN PYTHON

04

OOPS IN PYTHON

TOOLS/ACTIVITIES USED

DEMONSTARTING WITH MOTHERBOARD

GAMING

https://studio.code.org/home

HACKERRANK

https://www.hackerrank.com/contests/learncoding108/challenges

SNAKIFY

https://snakify.org/en/

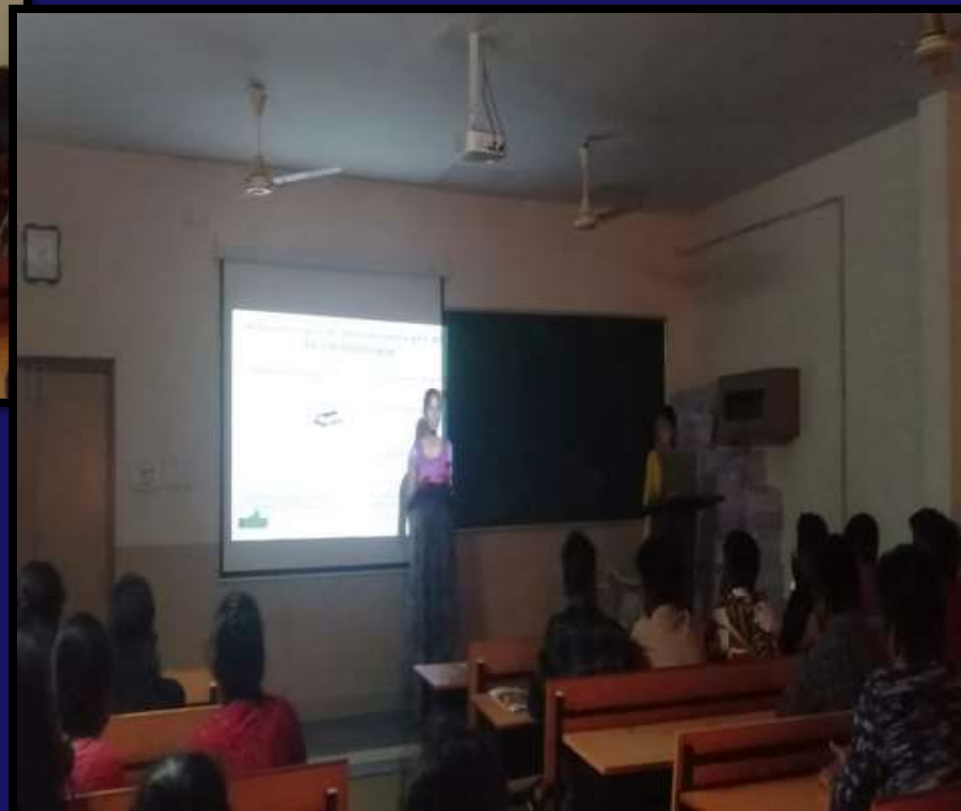
KNOWING THE COMPUTER

Problem

Understanding the internal structure of the computer

Solution

- Demonstrating with real time parts
- Student presentations



INTRODUCTION TO PROGRAMMING

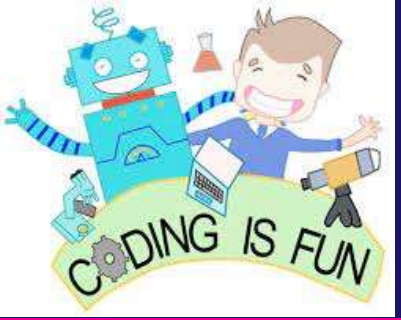
UNDERSTANDING THE PROBLEM

LOGIC BUILDING

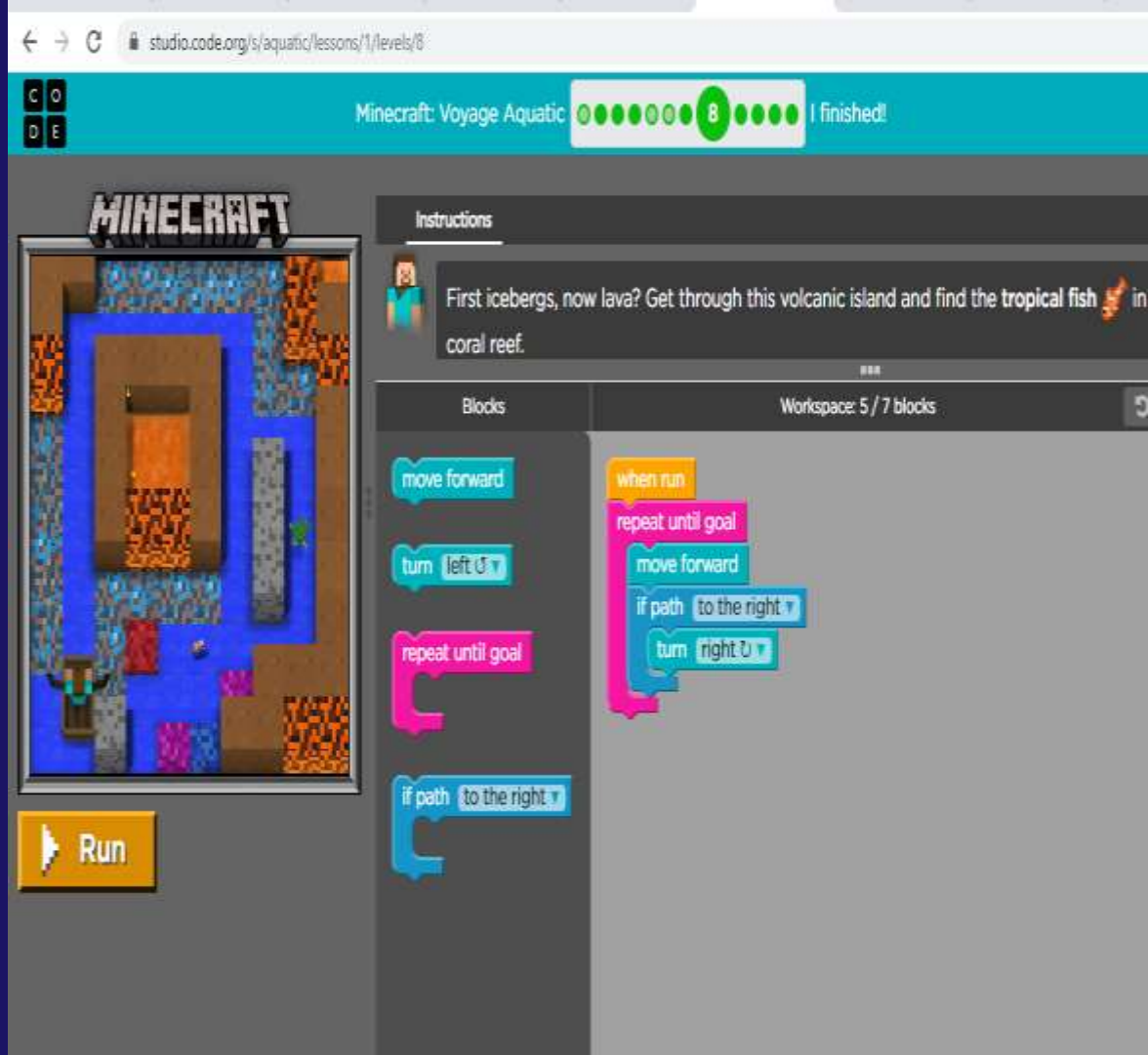
IMPLEMENTATION

CODING WITH GAMING

- https://studio.code.org/home
- **Student can select a character**
- **Complete all the levels by understanding the statement clearly**
- **Finally a certificate will be issued after completion**



- This involves individual blocks of pre-written code that can be dragged and dropped into the script, just like a puzzle piece.



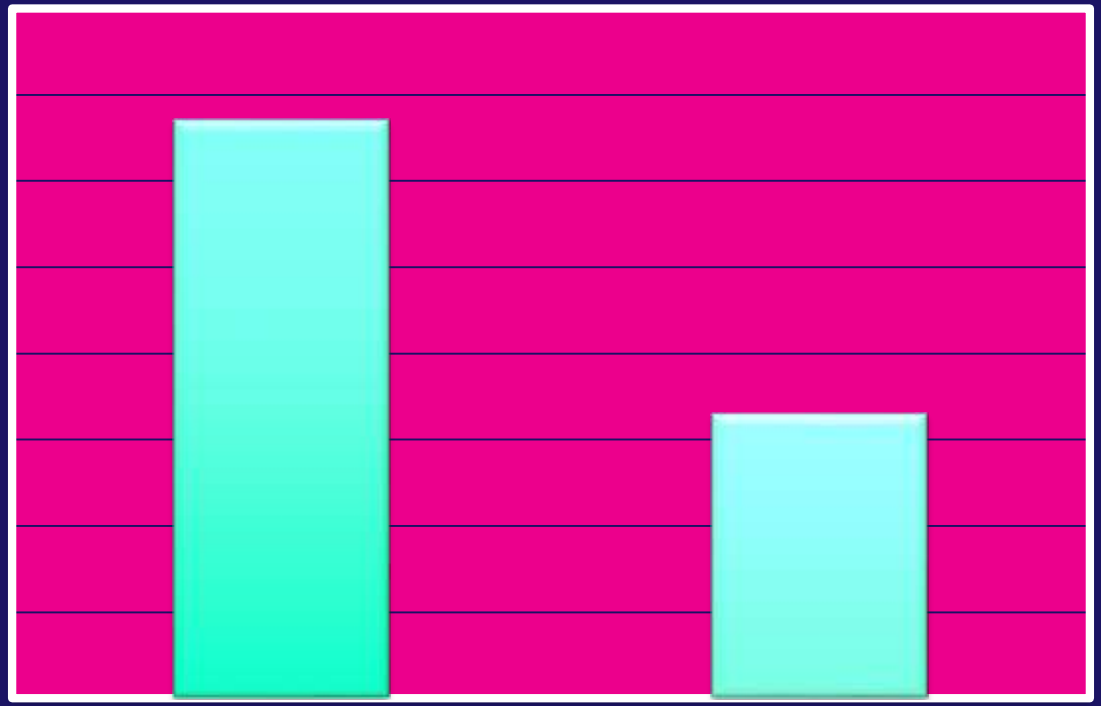
STUDENT CERTIFICATES AFTER COMPLETION OF THE LEVELS

OBSERVATIONS

REG NO	NAME	TIME TAKEN
22PA1A0201	A MOUNIKA	1HR 20MIN
22PA1A0202	A CHANDRA	1 HR
22PA1A0207	B ANITH RAM	1HR 30MIN
22PA1A0209	B SRI	1 HR
22PA1A0210	CHALLA ANUPRIYA	1HR 30MIN
22PA1A0212	CH PRADEEP KUMAR	1HR 20MIN
22PA1A0213	CHINTA DEVI SRI	1HR 30MIN
22PA1A0215	YASASWINI SAI SRI	1HR 30MIN
22PA1A0216	DEEPIKA RANI G	1HR 20MIN
22PA1A0217	D NIRMALA LIKHITHA	1HR 20MIN
22PA1A0219	GOGU NISHMA	1HR 20MIN
22PA1A0221	JAKKAMPUDI SOWMYA SRI	1HR 30MIN
22PA1A0224	KVENKATA NAGA LIKITH	1HR 20MIN
22PA1A0225	SIDDHARTH	1HR 30MIN
22PA1A0226	SHANKARSASTRY	1HR 30MIN
22PA1A0228	KOLLA JYOSTNA	1HR 20MIN
22PA1A0229	KOLLATI HARI PRASANNA	1HR 20MIN
22PA1A0230	K LAKSHMI PRASANNA	1HR 30MIN

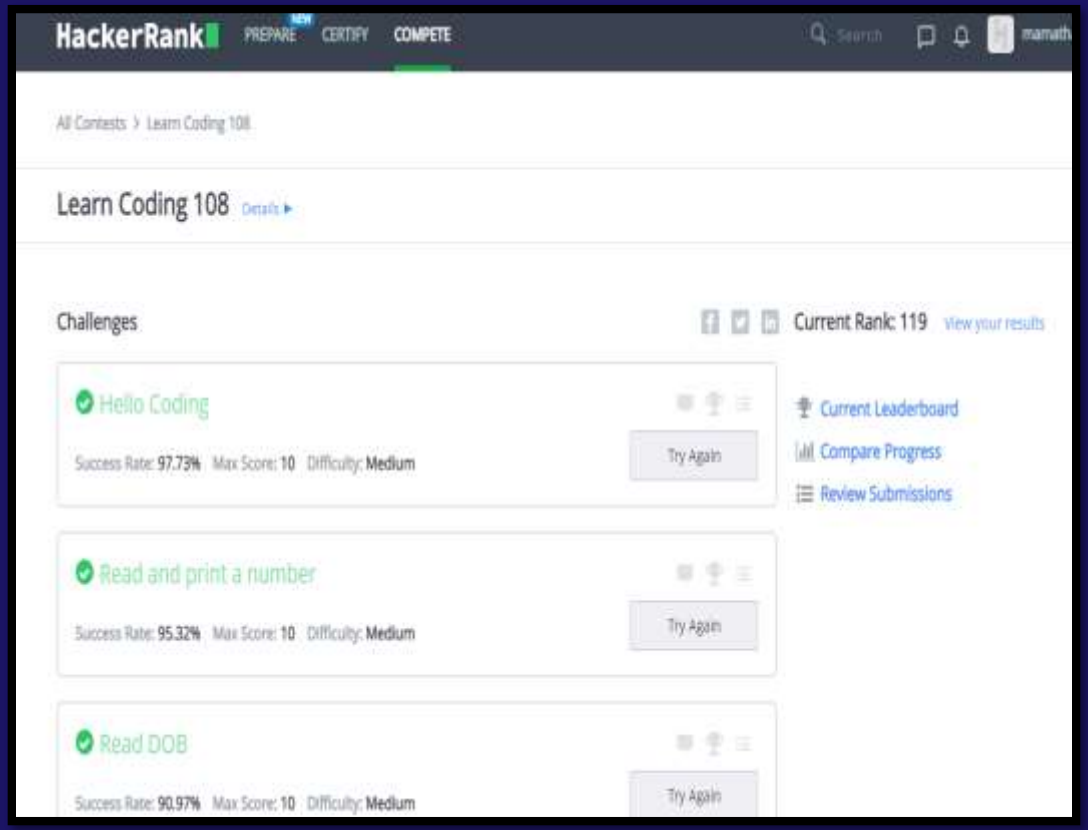
REG NO	NAME	TIME TAKEN
22PA1A0203	A PRAVEEN	2HR
22PA1A0204	GANESHDURGA	1HR 45MIN
22PA1A0206	A SAIRAM	2HR
22PA1A0208	MAHESWARI	2HR
22PA1A0211	CH SWAMI	2HR
22PA1A0214	CHOPPALA MOHITH	2HR
22PA1A0218	ENNI RAMESH BABU	1HR 45MIN
22PA1A0220	I KAVYA SUSHITHA	2HR
22PA1A0222	JOGI BHAVYA SREE	2HR
22PA1A0223	NARAYANA SWAMY	2HR 30 MIN
22PA1A0227	NAGASRI	2HR
22PA1A0240	M VARSHITH	2HR
22PA1A0241	AYYAPPA	2HR
22PA1A0242	DURGA PRASAD	2HR 30 MIN
22PA1A0243	M SRINIVAS	2HR 30 MIN
22PA1A0246	PRAVEEN BABI	2HR
22PA1A0254	SETTI JOY PETER	2HR
22PA1A0255	SETTI SURENDRA	2HR

ANALYSIS AFTER COMPLETING MINECRAFT LEVELS




PROGRAMMING IN
PYTHON

USING HACKERRANK



- https://www.hackerrank.com/contests/learncoding108/challenges
- Specially for the beginners
- https://www.hackerrank.com/pythonbegin1f

CHECKING LEADERBOARD

Comparison

mamatha_d VS 22pa1a0219 Compare

Challenges	mamatha_d(119th)	21pa1a0219(142nd)
Hello Coding	10.00pts (55707:05)	10.00pts (58653:12)
Read and print a number	10.00 (55756:35)	10.00 (58653:38)
Read DOB	10.00 (57432:36)	10.00 (58679:39)
Addition of two numbers	10.00 (57436:10)	10.00 (58671:11)
Division and Modulo Division	10.00 (57438:15)	10.00 (60241:05)
Check if given number is odd	10.00 (57439:54)	10.00 (60243:47)
Print the smallest of 2 numbers	10.00 (60394:59)	10.00 (60246:01)
Print the largest of 2 numbers	10.00 (60395:53)	10.00 (60247:47)
Square of given number	10.00 (60396:18)	10.00 (60248:43)

Check if the given number is prime or not	10.00 (61868:31)	Did Not Attempt
Check if the given number is reverse prime or not	10.00 (61876:57)	Did Not Attempt
Count digits in given number	10.00 (61878:27)	Did Not Attempt
Check if given number is lucky number or not	10.00 (61885:21)	Did Not Attempt
Count of odd digits in the given number	10.00 (61896:19)	Did Not Attempt
check if given number is Armstrong number or not	10.00 (61902:57)	Did Not Attempt
Design an arithmetic calculator using switch	10.00 (63283:23)	Did Not Attempt
print Number of Trailing Zeros in binary value of given number	10.00 (66087:30)	Did Not Attempt
Winner Card	10.00 (66116:28)	Did Not Attempt
positive odd number marks	10.00 (66211:58)	Did Not Attempt
Drona Score	10.00 (67407:56)	Did Not Attempt
Disneyland card game	10.00 (67411:51)	Did Not Attempt

USING SNAKIFY

- https://snakify.org/en/
- Best platform for the students to practice python programming

USING SNAKIFY

- More number of problems for practice
- Teacher can check the student progress easily.

WEEKLY ANALYSIS

	WEEK 1		WEEK 2		WEEK 3	
Reg no	HAKERRANK Target-10 prog	SNAKIFY Target-9	HAKERRANK Target-10 prog	SNAKIFY Target-10	HAKERRANK Target-20 prog	SNAKIFY Target-12
22PA1A0201	10	9	10	10	20	12
22PA1A0202	10	9	10	10	20	12
22PA1A0207	10	8	10	10	20	12
22PA1A0209	10	8	10	10	20	10
22PA1A0210	10	9	10	10	20	12
22PA1A0212	10	8	10	9	20	12
22PA1A0213	10	8	10	9	20	12
22PA1A0215	10	8	10	10	20	12
22PA1A0216	10	9	10	10	20	12
22PA1A0217	10	9	10	10	20	12
22PA1A0219	10	9	10	10	20	10
22PA1A0221	10	9	10	10	20	12
22PA1A0224	10	9	10	10	20	12
22PA1A0225	10	9	10	10	20	12
22PA1A0226	10	9	10	10	20	12
22PA1A0228	10	9	10	10	20	11
22PA1A0229	10	9	10	10	20	12
22PA1A0230	10	7	10	10	20	12
22PA1A0231	10	9	10	10	20	12
22PA1A0232	10	9	10	10	20	12
22PA1A0233	10	9	10	9	20	12

	WEEK 1	WEEK 2	WEEK 3
Reg no	HAKERRANK Target-10 prog	HAKERRANK Target-10 prog	HAKERRANK Target-20 prog
22PA1A0203	7	7	15
22PA1A0204	8	10	20
22PA1A0206	8	10	20
22PA1A0208	10	10	18
22PA1A0211	9	8	18
22PA1A0214	9	10	20
22PA1A0218	8	8	20
22PA1A0220	10	10	18
22PA1A0222	10	10	20
22PA1A0223	9	8	20
22PA1A0227	10	10	20
22PA1A0240	10	10	20
22PA1A0241	8	8	16
22PA1A0242	5	10	20
22PA1A0243	10	10	15
22PA1A0246	10	8	15
22PA1A0254	9	10	20

OOPS IN PYTHON

Problem

Moving from functional to object oriented approach

Solution

- Encouraged the students to come up with interesting examples

OOPS IN PYTHON EXERCISE

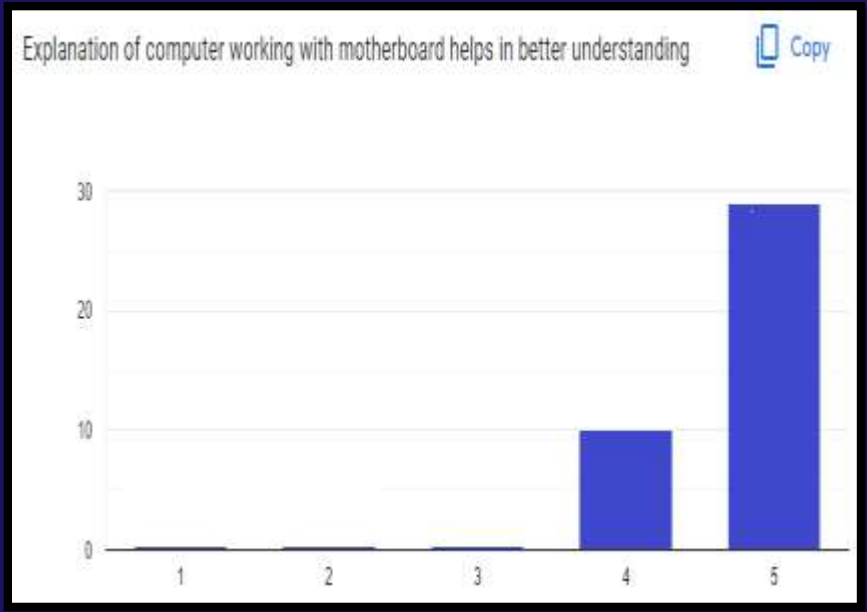
main.py | Shell

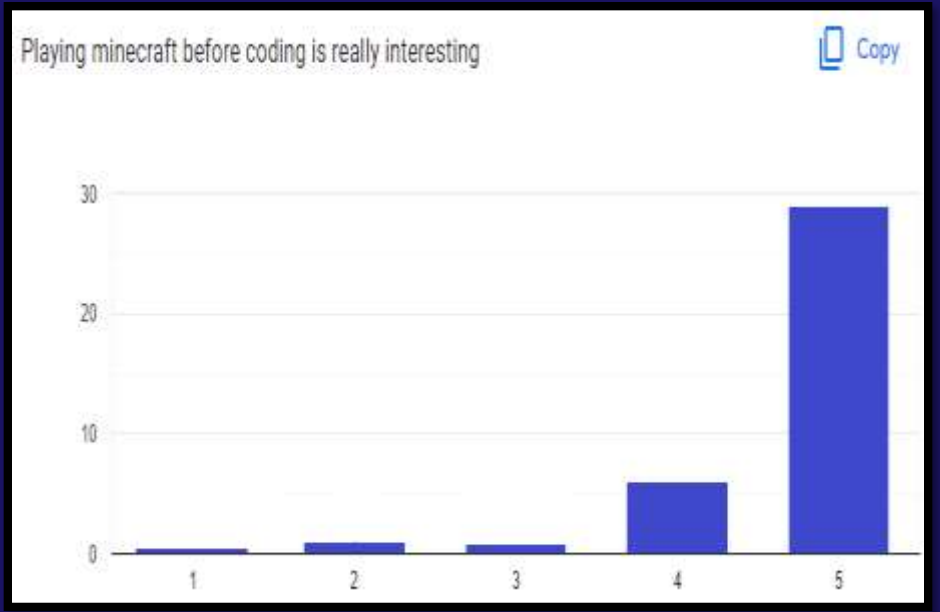
```python
class cricket:
    balls=36
    def __init__(self,name,runs):
        self.name=name
        self.runs=runs
    def check_best_batsman(self):
        if self.runs>=100:
            return True
        else:
            return False
s1=cricket ("virat",100)
s2=cricket ("surya",50)
print(s1.check_best_batsman())
print(s2.check_best_batsman())
print(s1.name,s1.runs,s2.name,s2
    .runs)
print(s1.balls)
```

new*

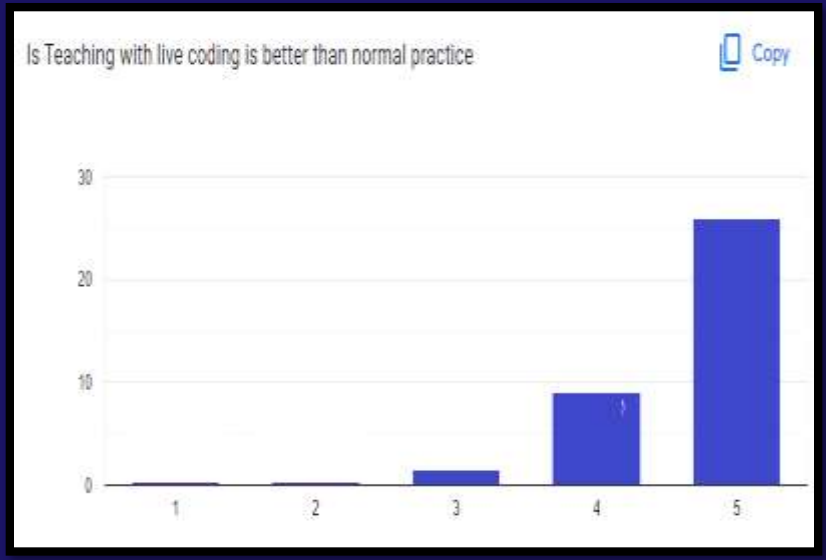
```python
class movie:
    def __init__(self, cinema, collection):
        self.cinema=cinema
        self.collection=collection
    def check_hit_flop(self):
        if(self.collection>=200):
            return True
        else:
            return False
m1=movie ("veera simha reddy",194)
m2=movie ("walter veerayya", 215)
print(m1.check_hit_flop())
print(m2.check_hit_flop())
```

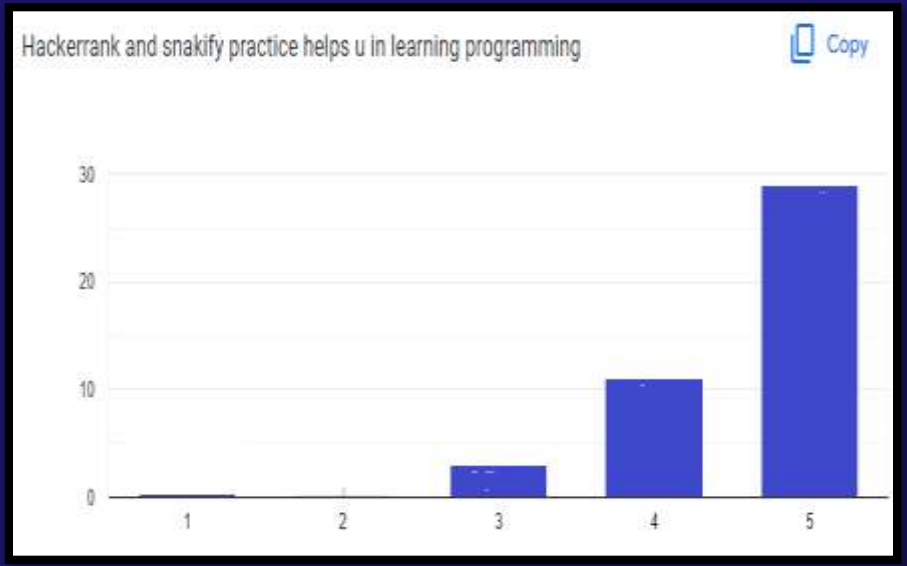
STUDENT FEEDBACK





STUDENT FEEDBACK





COURSE OUTCOMES

CO's

After the completetion of the course students can able to

CO1

Understand the working of various components of a computer

CO2

Develop computational thinking and be able to use Python constructs to solve basic problems

CO3

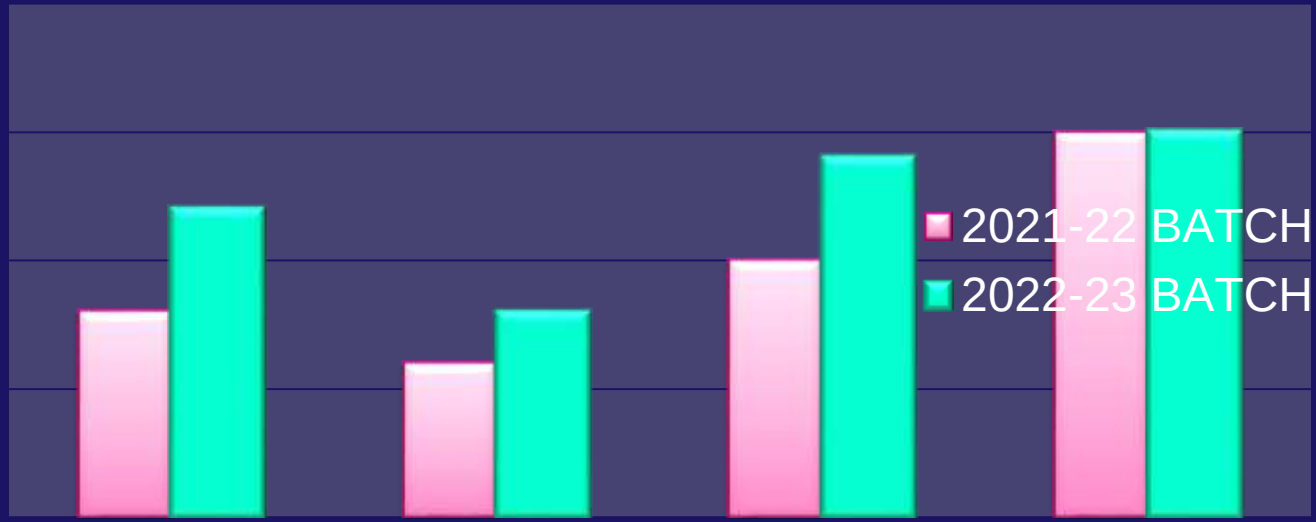
Understand modularization, data structures, file handling concepts in Python

CO4

Solve real world problems by applying Object Oriented Concepts

MID EXAM ANALYSIS

Total strength	Q1- CO1	Q2 – CO2	Q3,4,5- CO3	Q6- CO4	
EEE – 66	58	55	59	60	Students who have scored more than 50% marks in each of the questions.



MACHINE LEARNING PRESENTATIONS

NVDIA DL CERTIFICATIONS

THANK YOU

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Application of Paired Problem Solving for Effective Identification of Misconceptions

N S D Prakash Korlepara,
Electrical and Electronics Engineering, Vishnu Institute of Technology, Bhimavaram,
Andhra Pradesh – 534 202

***Abstract*— In engineering education, most courses have numerical problems and complex concepts that need to be applied. Students sometimes find it difficult to apply the concepts in numerical problems and subsequently end up performing poorly in examinations. Timely feedback on numerical problems solved by the students will address this. A systematic understanding of student misunderstandings and misconceptions is likely to lead to improved effectiveness in learning. TAPPS (Think Aloud Paired Problem Solving) is one of the best practices in engineering education and provides an opportunity for students to solve problems collectively by thinking and sharing their individual thoughts and ideas. When the instructor is involved as a keen observer the student misconceptions can be documented comprehensively enabling the instructor to address the problem in a timely manner. TAPPS also provides ample scope for educators to identify individual thinking processes and understanding patterns and therefore enables them to guide the students towards the correct approach to problem solving. This article describes a case study of an implementation of TAPPS with a dialogue conducted for undergraduate electrical engineering students in the third year.**

***Keywords*—TAPPS, Numerical Problem Solving, Heterogeneous groups**

***JEET Category*—Practice**

I. Introduction

Student misunderstanding and misconceptions are major hindrances in the learning processes of Engineering subjects (Trotskovsky et al., 2013). A misconception can be a wrong opinion or belief in one's mind, this further leads to a series of errors and mistakes based on their flawed understanding (Makonye et al., 2012). The reason for encountering an error or mistake while procedurally solving a mathematical problem is an inadvertent departure from the truth. Furthermore, the author emphasized that errors can also occur due to a student's misjudgment or carelessness which could be remedied through practice. (Mulungye et al., 2016).

This paper was submitted for review on September, 09, 2023. It was accepted on November, 15, 2023.
Corresponding author: N S D Prakash Korlepara, Electrical and Electronics Engineering, Vishnu Institute of Technology, Andhra Pradesh, India.
Address: Assistant Professor, Electrical and Electronics Engineering, Vishnu Institute of Technology,Bhimavaram-534202
(e-mail: prakash205k@gmail.com)

J. Weliwita et al., (2020) strongly state that the student academic performance in the Engineering stream at the University was greatly impacted by prior misconceptions and that therefore the educator needs to track student understanding and identify potential misconceptions in undergraduate courses and attempt to address through various pedagogical techniques. Unearthing and understanding misunderstandings and misconceptions of students are made more effective by probing students' underlying assumptions through questions and guiding students to construct better understanding by themselves. The role of prior knowledge in learning is well documented in current educational research literature (Bransford, et all 1999).

II. Literature Review

Think Aloud Pairing and Problem Solving (TAPPS) is an approach to student engagement based on metacognition. It allows the student to work in pairs to solve the problem, one in the role of problem solver, allows him to think and verbalize the thought process and solves the problem; meanwhile other students keenly observed the problem solver's thoughts and the roles were interchanged for a different problem (Abdul Kani, et al., 2015). Collaborative learning enhances the learning skills of students (K. Ramprathap et al 2019). The TAPPS technique is a collaborative learning method that enhances the problem-solving skills of learners, this peer learning approach applicable for various disciplines including technical courses.,the author implemented TAPPS activity for Automobile Engineering Students by forming the student batches of 4 or 5 members each and had them work together and solve the problem, during the process, the instructor acted as an observer and graded based on performance and the activity ended with a discussion of the correct answer (S. S. More et al., 2023). In (Engelmann et al., 2011], the author focused on the significance of misconceptions and claimed that addressing misconceptions improves the learning process. In the article (Patil, et al., 2019) the authors described different types of misconceptions and their sources and also presented a detailed discussion about tools and techniques to identify the misconceptions. One can summarize that the identification and addressing of misconceptions plays a crucial role in the learning process, however there are very few references available on effective identification and addressing the misconceptions. Students struggle to handle numerical problems and the failure rate is high in external examinations. In regular teaching, although the educator delivers content very effectively in the class, he doesn't know to what extent and in what way the student has received the concepts and/or

understood how to apply the concepts learnt. This article describes the steps involved in setting up the student pairs and assigning numerical problems with variations to the different student pairs in the class. After setting up, TAPPS was implemented and student misconceptions were identified systematically and were addressed in the class in a timely manner.

III. METHODOLOGY

The case study was conducted for third -year second - semester Electrical and Electronics Engineering students in a Power Systems Analysis course. Course outcomes are truly one of the imperative tools used in the teaching assessment process in education.(Durga Prasad et al 2021). The learning outcomes for the course are described in Table 1 below

TABLE I
COURSE OUTCOMES

At the end of the course, the students should be able to:

CO1	Represent the per unit quantity representation and develop per unit reactance diagram and Y bus matrix of a power system network.
CO2	Develop Z bus matrices of a power system network by using different techniques.
CO3	Solve load flow problems of the interconnected power system network by different iterative methods.
CO4	Perform symmetrical short circuit analysis.
CO5	Perform unsymmetrical short circuit analysis with due understanding of power system stability.

TABLE II
ACTIVITY DETAILS

Course name	Power Systems Analysis
Year & Branch	III year II semester
Topic	Numerical problems on Unsymmetrical fault analysis of unloaded synchronous generator
Course Outcome	CO5 in Table 1
No. of students	54
No. of groups	21
Students per batch	2 or 3
Duration of activity	50 Minutes

Table II above shows the details of the activity. The activity described in this paper was conducted for the 2019-20 cohort of students and relates to one specific learning outcome (CO5- Perform unsymmetrical short circuit analysis with due understanding of power system stability in Table 1) in this course.

The theory and concepts relevant to the topic above was covered in the earlier class session and the TAPPS activity was conducted in the next class session. Below is the detailed procedure to conduct activity.

Step-1 Form student pairs and groups

Step-2 Assign different problems on selected topic

Step-3 Allow students to solve the problem in their groups

Step-4: Monitor student groups and interact with them as needed. Document observations for each group (Table VI)

Step-5 Write the activity report along with the list of misconceptions. (Table VII)

Step-6 Take the appropriate remedial action

A) Form student groups

Student grouping was done based on their academic performance from previous semester end examination results. Research shows that mixed-ability grouping / heterogeneous grouping allows for the exchange of ideas and perspectives, leading to deeper understanding [B. Cernilec et al., 2023]. Table III illustrates the details of categorization of students for grouping. The groups are formed in such a way that in each group at least one student is from category 1, and one or two from category 2 or category 3.

TABLE III
STUDENT GROUPING DETAILS

Category 1	0 Fail Grades up to previous semester
Category 2	< 5 Fail Grades up to previous semester
Category 3	> 5 Fail Grades up to previous semester

B) Assign different problems on selected topic

Four problems were given on selected topics as shown in "Fig.1". Table IV is the representation of "Fig.1" for clarity; these problems were assigned to the different groups. All the problems were of equal difficulty with different parameters used to result in uniquely different answers.

Fig. 1 Different model problems on selected topic

TABLE IV
DIFFERENT MODEL PROBLEMS ON SELECTED TOPIC

Problem Number 1	3-Ø, Synchronous Generator, X_1 =j 0.5 P U, X_2 = j0.35=PU, X_0=j0.10 PU, MVA=25, KV=13.2. LG fault on Generator terminals, Z_f =0, Z_n=0. Calculate Fault current I_f, Line-Line voltages.
Problem Number 2	3-Ø, Synchronous Generator, X_1 =j 0.5 P U, X_2 = j0.35=PU, X_0=j0.10 PU, MVA=25, KV=13.2. LG fault on Generator terminals, Zf =j0.1PU, Zn=j0.6PU. Calculate Fault current If , Line-Line voltages
Problem Number 3	3-Ø, Synchronous Generator, X_1 =j 0.5 P U, X_2 = j0.35=PU, X_0=j0.10 PU, MVA=25, KV=13.2. LL fault on Generator terminals, Zf =0, Zn=j0.4PU. Calculate Fault current If , Line-Line voltages
Problem Number 4	3-Ø, Synchronous Generator, X_1 =j 0.5 P U, X_2 = j0.35=PU, X_0=j0.10 PU, MVA=25, KV=13.2. LL fault on Generator terminals, Zf =j0.2, Zn=∞. Calculate Fault current If , Line-Line voltages.

C) Allow students to solve the problem in their groups (30 minutes)

Table V shows the assignment of problems to the student groups. After assigning the problem, the instructor asked the student groups to solve the problems. The "Fig.2" shows student batches are seriously involved in problem solving. Without pairing of students, the instructor was not able to ensure every student was involved. With pairing, every student is compelled to participate.

TABLE V
PROBLEM ASSIGNMENT

GROUP NUMBER	PROBLEM NUMBER
1, 5, 9, 13, 17, 21	1
2, 6, 10, 14, 18	2
3, 7, 11, 15, 19	3
4, 8, 12, 16, 20	4

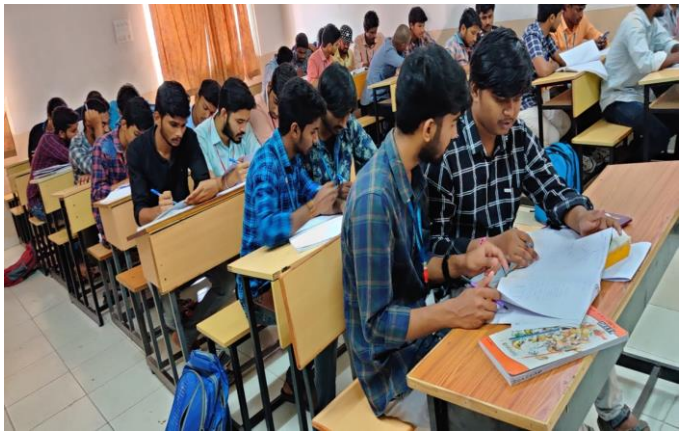

Fig. 2. Student groups solving problems

D) Monitoring of Student Groups and Documenting Report

Monitoring of student groups plays a very important role in this activity, here the educator plays an observer role as illustrated in "Fig.3" and carefully examines the student groups in the following aspects.

1. Individual thinking process towards problem solving.
2. Student understanding pattern based on question.
3. Points of struggle in solving the problem.

In this step, the educator can directly interact with the student batches and try to understand their thinking. Further, a dialogue approach was used to directly ask them about the challenges and difficulties facing in solving the problems which triggered their thinking and metacognition. Finally detailed reports on observations for each group were made. "Fig. 4" shows the instructor making notes of the observations while interacting with one of the groups.

Fig. 3. Monitoring the student groups

Fig. 4. Report on observations for each group

E) Write the activity report along with the list of misconceptions

In total 11 out of 21 groups had errors, Table VI below

represents observations and Table VII shows the corresponding misconceptions for each group

TABLE VI
OBSERVATIONS

Group no.	Observation
5, 8, 19	Mixed up appropriate fault conditions
10, 12 & 18	Mistakes in calculation of effective zero sequence impedance
3	Not knowing how to convert per- unit values to actual values.
8 &16	Wrong impedance diagrams
1, 13	Calculation errors

TABLE VII
LIST OF MISCONCEPTIONS CORRESPONDING OBSERVATIONS

Group no.	Misconception
5, 8, 19	Fault conditions are the same with fault impedance and without fault impedance.
10, 12 &18	Omitted the neutral impedance effect, assuming that the effective zero-sequence impedance will be the alternator's corresponding zero-sequence impedance.
3	Assumed that the choice of base current was arbitrary (instead of calculating from base power and base voltage).
8 &16	Mixed positive sequence impedance with negative sequence impedance. Assumed that negative sequence impedance also has a source. Ignored neutral impedance and fault impedance.
1, 13	Ignoring imaginary part when doing Fault calculation in complex notation.

Table VI identifies the type of error done by the students, whereas Table VII describes the underlying misunderstanding or misconception. For instance, one of the major errors students made is in the calculation of effective zero sequence impedance and the related misconception that it revealed was that students omitted the neutral impedance effect, assuming that the effective zero-sequence impedance will be only the alternator's corresponding zero-sequence impedance.

F) Appropriate remedial action

The appropriate remedial action must be done based on the type of misconceptions; the following are the various types of remedial actions to fix the misconceptions.

1. Address and discuss the root of the misconceptions clearly with the students. This is possible for simple misunderstandings and misconceptions by making the students think.
2. Conduct tutorials. This is needed for deeper understanding needed to solve numerical problems with varied parameters.
3. Giving follow up assignments. This may be needed depending on the depth of the errors.

IV. RESULTS AND DISCUSSIONS

The TAPPS activity made it possible to address the different misconceptions mentioned in table VII from the diversity of groups illustrated in tables VI and VII. Without the activity, the details of the misconceptions will not have been available to be addressed. Addressing misconceptions followed by conducting a tutorial session was the remedial action done in this case study. After remedial action, a second assessment was done by assigning problems to students in a mock exam. Table VIII illustrates the performance of the students before and after the remedial actions based on the mock exam which shows the improvement in the students problem solving ability.

TABLE VIII
IMPACT OF ACTIVITY ON STUDENT PERFORMANCE

% of Students with minimal errors in responses in the mock exam	
Before remedial action	After remedial action
50%	81.5%

The activity described above can be replicated in other topics/ outcomes in the same course or a different course as well. Over time, the instructor can identify the list of misconceptions corresponding to all the topics in the course. This list of misconceptions helps educators to teach effectively for upcoming batches. Table IX below shows the impact of activity on end semester exam results. It is interesting to note that the number of students not attempting the question related to this outcome was the lowest when TAPPS with feedback was done in the year. It is assumed that the preparation level of the students was improved as a result of this activity because of deeper discussions. This is a possible reason for the improved confidence level of the students resulting in the larger percentage of students attempting the questions. Further the percentage of students with F grade in the end exam has reduced significantly after the introduction of TAPPS.

TABLE IX
IMPACT OF ACTIVITY ON STUDENT PERFORMANCE

Academic Year	Activity	Percent Students who did not attempt question	Percent Students with 'F' Grade
2018-19	None	-	18.4%
2019-20	TAPPS	3.9	7.1%
2020-21	Tutorials	10.7	9.1%
2021-22	Tutorials	8.0	4.1%

The author was the course instructor for four successive academic years, and the activity described here was implemented from the 2019-2020 academic batches onwards. However, the 2020 - 21 academic batches were affected by the COVID pandemic and the classes were conducted in online mode and cannot be compared with earlier batches directly. However, the deeper study of student understanding and misconceptions from the previous year helped the instructor consciously address these topics with more attention to details and spending more time where needed. This is an intangible benefit.

V Conclusion

Misunderstanding and misconceptions are major hindrances in the learning processes. Problem solving skills are important in engineering courses. Student centered reflective learning practices such as TAPPS enable better student engagement and therefore better learning gains. Observation and facilitation skills are needed to maximize the impact of these approaches. A deeper understanding of the students' misunderstandings and misconceptions improves the effectiveness of teaching and reduces problem solving errors in students. In the longer term, such approaches enable the teacher to become more effective as a teacher and move towards teaching higher level learning outcomes

Acknowledgement

The author wishes to extend their profound gratitude to the Management of Shri Vishnu Educational Society for their exceptional contribution and for their facilitation of faculty engagement in scientific educational practices and pedagogy through Vishnu Educational Development and Innovation Centre (VEDIC), Aziznagar, Hyderabad.

The author is also deeply grateful to Dr. Sivakumar Krishnan, Director of Learning and Innovation at Vishnu Educational Development and Innovation Centre (VEDIC) for his continuous encouragement and invaluable guidance throughout the completion of this article.

Finally sincere thanks from the author go to Dr. D. Suryanarayana, Principal & Director, Dr. R. V. D. Rama Rao, Head of the Department (EEE), Vishnu Institute of Technology, Bhimavaram for their consistent support and unwavering encouragement.

References

Trotskovsky, E., Waks, S., Sabag, N., & Hazzan, O. (2013). Students' misunderstandings and misconceptions in engineering thinking. *International Journal of Engineering Education, 29(1), 107-118.*

Makonye, Judah P. (2012). Learner Errors on Calculus Tasks in the NSC Examinations: Towards an Analytical Protocol for Learner Perturbable Concepts in Introductory Differentiation. *International Journal of Learning, 18(6),339-356*.

Mulungye, M. M., O'Connor, M., & Ndethiu, S. (2016). Sources of student errors and misconceptions in algebra and effectiveness of classroom practice remediation in Machakos County--Kenya. *Journal of Education and Practice, 7(10), 31-33*.

Weliwita, J., Sanchez, J., & Almasalmeh, M.(2020). Mathematical misconceptions of students in Engineering education: statistical analysis and suggestions to pedagogical approaches. *2020 Advances in Science and Engineering Technology International Conferences (ASET), 1-6.*

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.).(2000). How people learn: Brain, mind, experience, and school. *National Academy Press*,11.

Kani, N.H., & Shahrill, M. (2015). Applying the Thinking Aloud Pair Problem Solving Strategy in Mathematics Lessons. *Asian journal of management sciences & education, 4(2), 20-28*.

Ramprathap.K, Rajaram.S, and Inayath Ahamed S.B.(2019). Impact of social media factors affecting students' academic development through collaborative learning. *Journal of Advanced Research in Dynamical and Control Systems, 11(1), 661-666.*

More, S. S., & Kadam, D. M. (2023). Effectiveness of Think Aloud Pair Problem Solving and Case Study based Active Learning Techniques for Engineering Classroom, Journal of Engineering Education Transformations, 36(Special Issue 2), 419-424.

Engelmann, C. A., & Huntoon, J. E. (2011). Improving student learning by addressing misconceptions. *Eos, Transactions American Geophysical Union, 92(50), 465-466.*

Patil, S. J., Chavan, R. L., & Khandagale, V. S. (2019). Identification of misconceptions in science: Tools, techniques & skills for teachers. *Aarhat Multidisciplinary International Education Research Journal,8(2), 466-472*.

Garapati, D. P., Padmaja, S. M., & Ramana, N. V. (2021). Teaching and Assessment of Course Outcomes in Switching Theory and Logic Design Course: A Case Study. In Assessment Tools for Mapping Learning Outcomes with Learning Objectives. *IGI Global, 97-115*.

Cernilec, B., Cotic, M., Felda, D., & Doz, D. (2023). Differences in Students' Mathematics Knowledge in Homogeneous and Heterogeneous Groups. *European Journal of Science and Mathematics Education, 11(1), 15-32.*

Enhancing Student Performance Through Activity-based Learning

Mr Ch Siva Narayana
Vishnu Institute of Technology (A), Bhimavaram
Department of EEE

Information Sheet

- Name: Mr Ch Siva Narayana
- Institution: Vishnu Institute of Technology, Bhimavaram
- Department: EEE
- Title of Presentation: Continuous evaluation and feedback to improve student learning
- Subject Taught: Basic Electrical & Electronics Engineering (23EE2T01)
- Year of Student: I B Tech II Sem (CE)
- Number of Students in Class: 59

CONTENTS

- Syllabus
- Course Outcomes
- Activities
- Result Analysis

Syllabus

UNIT I

- **DC Circuits:** Electrical circuit elements (R, L and C), Ohm's Law and its limitations, KCL &KVL, series, parallel, series-parallel circuits, Super Position theorem, Simple numerical problems.
- **AC Circuits:** A.C. Fundamentals: Equation of AC voltage and current waveform, time period,frequency, amplitude, phase, phase difference, average value, RMS value, form factor, peak factor, voltage and current relationship with phasor diagrams in R, L, and C circuits (for sinusoidal waveform only), Concept of Impedance, Active power, reactive power and apparent power, Concept of power factor (Simple Numerical problems).

UNIT II

- **Machines:** Construction, principle and operation of (i) DC Motor, (ii) DC Generator, (iii) Single Phase Transformer, Applications of electrical machines.
- **Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments and Wheat Stone Bridge.

UNIT III

- **Energy Resources:** Conventional (Non-Renewable) and non-conventional (Renewable) energy resources; Layout and operation of various Power Generation systems: Hydel, Nuclear power generation.
- **Electricity bill & Equipment Safety:** Power rating of household appliances including air conditioners, PCs, Laptops,Printers, etc. Definition of "unit" used for consumption of electrical energy, two-part electricitytariff, calculation of electricity bill for domestic consumers. Working principle of Fuse and Miniature circuit breaker(MCB), merits and demerits. Personal safety measures: Electric Shock, Earthing and its types,Safety Precautions to avoid shock.

Syllabus

UNIT IV

- Introduction - Characteristics of PN Junction Diode — Zener Effect — Zener Diode and its Characteristics. Bipolar Junction Transistor — CB, CE, CC Configurations and Characteristics

UNIT V

- Rectifiers and power supplies: Block diagram description of a dc power supply, working of a full wave bridge rectifier, capacitor filter (no analysis), working of simple zener voltage regulator. Amplifiers: Block diagram of Public Address system, Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.

UNIT VI

- Overview of Number Systems, Logic, BCD codes, Excess-3 code, Gray code. Boolean Algebra, Basic Theorems and properties of Boolean Algebra, Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR. Simple combinational circuits–Half and Full Adders.

Course Outcomes

CO1	Analyze and solve electrical circuits, DC and AC, effectively using fundamental principles
CO2	Demonstrate a solid understanding of electrical machines and measuring instruments and applications.
CO3	Acquire knowledge of various energy resources and power generation systems and Gain awareness of electricity billing, safety measures, and electrical equipment efficiency.
CO4	Demonstrate the working and characteristics of semiconductor diodes and . Transistors
CO5	Know the working principles of rectifier, filter, regulator and amplifier.
CO6	Understand the number systems, Implement and apply the digital logic gates .

Problem Statement

- Students feel difficulty in solving problems on super position theorem in unit 1.
- After evaluating their mid-exam scripts most of the students confused to calculate two part tariff in unit 3.

Activity

- Number game (Activity done at starting of unit 1)
  - Outcome of this activity is to identify the logical thinking of the students in the class.

Activity

- Peer to peer Learning (activity done in the middle of unit 1)
  - Solving problem on super position theorem by sharing knowledge with their friends.

Activity

- Two – part tariff (Activity done after mid 1 exams)
  - Each student brings their electricity bill to class.
  - where we had performed a collective calculation of the bills.

APEPDCL

ELECTRICITY BILL SUV:1.8
Reading Mode :IR

DT:05-04-2023 Time:07:25
BNo 04234322367 GRP:M1
EKO BHIMAVARAM
SEC BHIMAVARAM-D1
DIST ELURU
UNQ SC 24847786

S.NO 1532430801031517
NAME K.PADMA VATHI
ADDR MENTEVARI THO
IPH :1
CAT :
SCAT :3-LT Domestic - Domestic
LOAD 1.00KW
CONNECTED LOAD 0.86KW
MF:1
RN62385399
METERING SIDE
INSTALLED CAPACITY 0

READING	MONTH	STS	
PRES KWH :	7646	05-04-2023	1
PREV KWH :	7627	07-03-2023	1
BILLED UNITS			19
AVG UNITS			16
MMD			0.65KVA

ENERGY CHRG	36.10
DEMAND CHRG	10.00
CAP CHRG	0.00
CUST CHRG	25.00
ED	1.14
SURCHARGES	0.00
ED INT	0.00
TRUEUP CHRG	23.00
ADJ AMOUNT	0.00
SHORT FALL	0.00
ACD SURCHRG	0.00
GRID SUPP CHRG	0.00
LOSS/GAIN	-0.24
BILL AMOUNT	95.00
GOVT SUBSIDY	0.00
NET AFTSUB	95.00
ISD-IDS	0.00
ARREARS	
BEF 01/04/22	0
AFT 01/04/22	0
NET AMOUNT	"95.00"
DUE DATE	19-04-2023
DISC DATE	05-05-2023

E&OE	For APEPDCL
SD AVAILABLE	10.
ACD TO PAY	0
TC SEAL NO	247455
FINAL READING	0
OLD MF	0
INIT READING	0
MTR CHG DT	
SHORT FALL UNITS	0
DTR CODE	053600801142
FDR CODE	05331109
PHONE	9963095445

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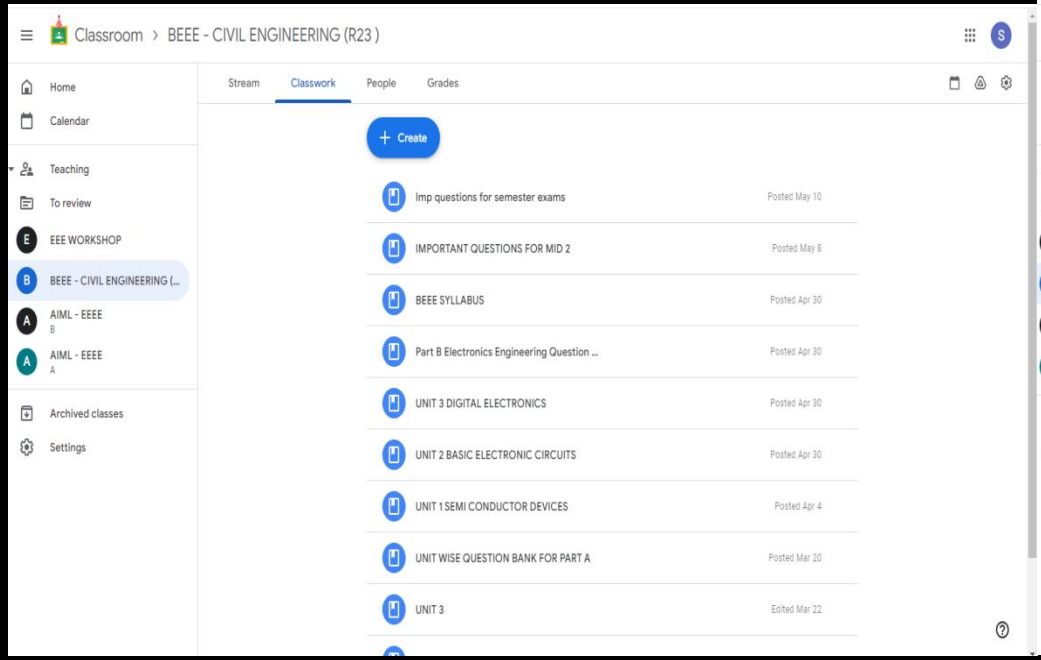
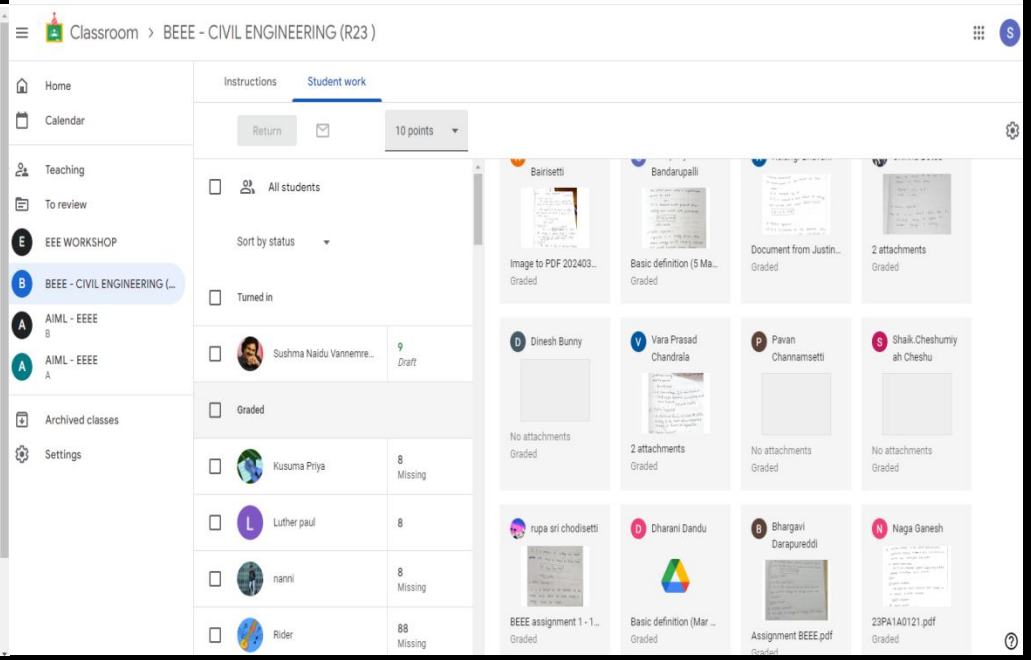
EFFECTIVE USAGE OF GOOGLE CLASSROOM FOR UPLOADING STUDY MATERIALS AND ASSIGNMENT'S

Subject material was shared to students Google - classroom	Students uploaded their assignments through Google-classroom





STUDENTS FEEDBACK

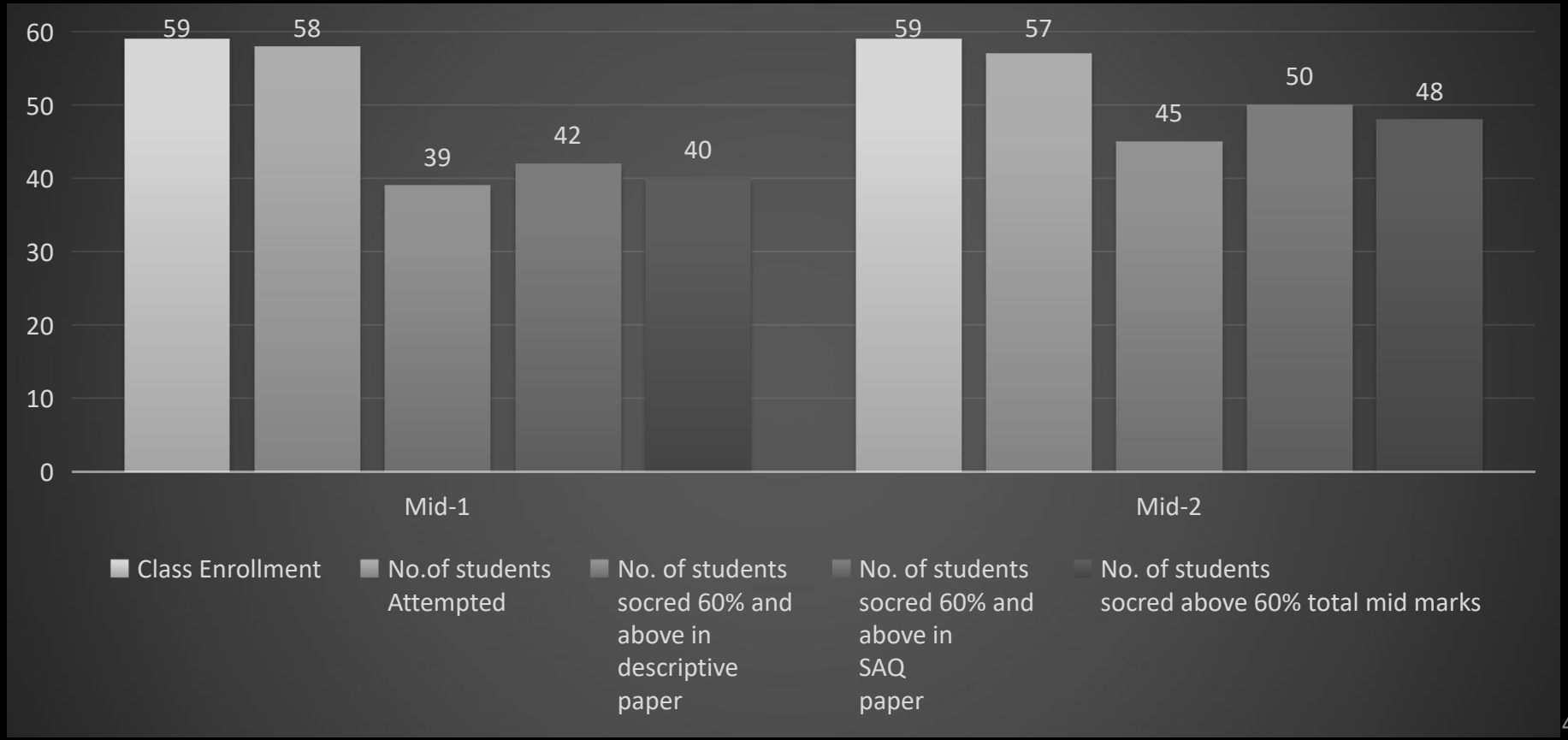
	A	B	C
1	**Which activity do you like most and why?**	**Which topic do you want more explanation**	**Any suggessions**
2	Number game, it was fun game	i want to know more about EV motors	we need more fun games
3	i like number game	everything good	none
4	calculation of electricity bill, after this only i understand how the bill was calculated	we want more practical experiments	good
5	number game	EV motors	none
6	bill calculation, after this only i understood clearly	explaining more problems	little voice louder
7	two part tariff calculation	need more safety precautions videos	little faster
8	super position problem solving	we need more problems to solve	good
9	problems solving	EV motors	none
10	number puzzle	we need more explanation of power plants	little slower
11	winning number game	expllain and relate few concepts in lab	none

Tutorial classes

Result analysis: Mid Exams

Subject: Basic Electrical & Electronics Engineering *A.Y: 2023-2024*

Branch/Sem: CIVIL I/II



Result Analysis

Section A						
23BS2T02	ENGG. PHY	Mrs.K.PADMA PAVANI [BS]	57	48	9	84.21
23BS2T05	DE & VC	Mrs.K.S.SUPRIYA [BS]	57	40	17	70.18
23EE2T01	BEEE	Mr.CH. SIVA NARAYANA [EEE]	57	49	8	85.96
23ME2T01	EG	Mr.VVS SARMA [CE]	57	50	7	87.72
23ME2T02	EM	Mr.B.DURGA VARA PRASAD [CE]	57	48	9	84.21
23IT2P02	IT WS	Mr.S.V.A DURGA PRASAD [IT]	57	56	1	98.25
23BS2P04	ENGG PHY LAB	Mrs.K.PADMA PAVANI [BS]	57	55	2	96.49
23EE2P01	EEE WS	Mr.CH. SIVA NARAYANA [EEE]	57	56	1	98.25
23CE2P01	EM & BP LAB	Mr.P.ROHITH [CE]	57	56	1	98.25
23BS2P05	H&W,YS	[]	57	57	0	100

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Thank You

A NOVEL APPROACH IN UTILIZING ICT TOOLS FOR PRACTICAL APPLICATION IN C PROGRAMMING

NAME:K.BHANUPRIYA
INSTITUTION:VIT-BHIMAVARAM
DEPARTMENT:EEE

TOOLS/ACTIVITY IMPLEMENTED

- Online GDB Compiler platform was used to practically observe , errors occurred while executing a C program.
- Using Google-classroom for sharing material and uploading videos through Ed-puzzle to Improve the Understanding of Complex Topics in C programming.
- Activity of Mind map on pointers was implemented to Broaden the understanding of usage of a pointer in c language in the context of blended mode of teaching.
- Continuous Assessment and Feedback for Effective Learning through Mentimeter tool in a First Year C programming Course.
- Skill-based Assessment by conducting think –pair-share activity to Improve logical thinking in optimizing the code in C language, in the First Year

Information Sheet

Name:	K.BHANUPRIYA
Institution:	VIT-BHIMAVARAM
Department :	EEE
Title of Presentation:	A NOVEL APPROACH IN UTILIZING ICT TOOLS FOR PRACTICAL APPLICATION IN C PROGRAMMING
Subject Taught:	INTRODUCTION TO PROGRAMMING
Year of Student:	I-YEAR (CE)
Number of Students in Class:	59

Overview of the Course

- *With knowledge in C, students are aware of computer architecture, memory addressing .*
- *Students are able to write clean, organized ,optimized and an efficient code.*
- *It acts as a prerequisite to become a System programmer/ Hardware engineer/Software engineer.*
- *Be a professional in embedded systems ,training machine learning algorithms.*
- *Gain knowledge in OS concepts –kernel.*
- *Game designer, various career opportunities .*

Motivation/Problem statement found after evaluating their mid-exam scripts

- Students were confused regarding the execution of C program.
- Students faced a problem in understanding the structure of C program and implementing an algorithm based on the logic.
- Misunderstood the concept of pointers in C language
- Students struggled between the difference's of a character and string

Learning Goals/ CO Statements

At the completion of the course, student should be able to:

No.	Statement	Bloom's level
CO1	Understand the Basics of Computers, Concept of algorithm and algorithmic thinking	L2
CO2	Analyse a problem and develop an algorithm to solve it.	L4
CO3	Implement various algorithms using the C programming language	L3
CO4	Understand more advanced features of C Language	L2
CO5	Develop problem-solving skills and the ability to debug and optimize the code.	L6

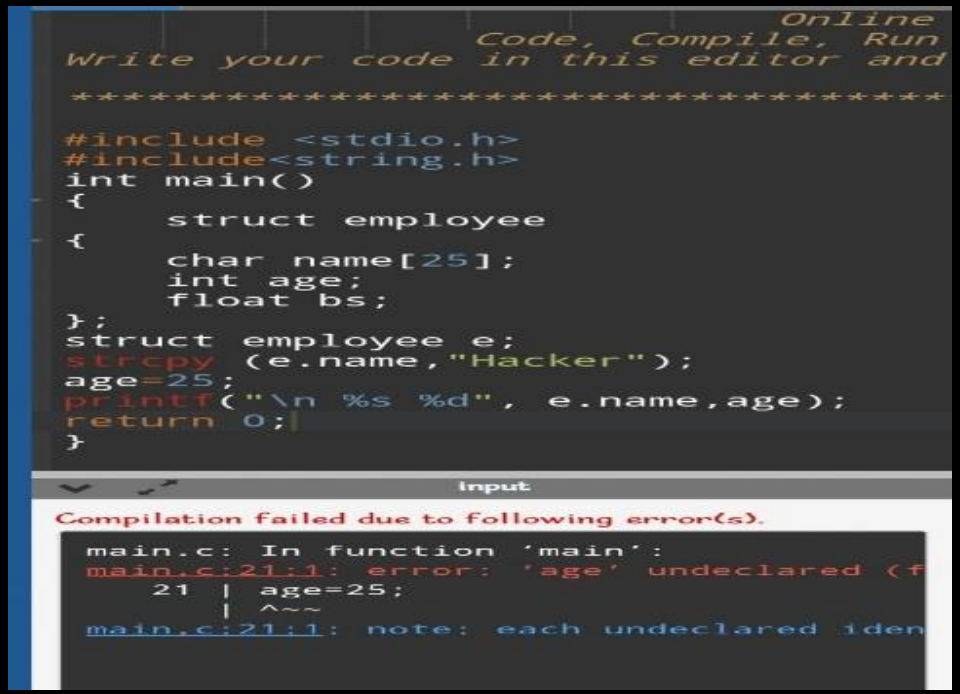
Activity and Assessment Table

No.	Activity	Assessment Format
CO1	Teaching using chalk board and video explanations	MID-I
CO2	Blended mode of teaching,used online GDB compiler platform	MID-I
CO3	Edpuzzle activity on strings concept	MID-II
CO4	Think-pair-share activity	MID-II
CO5	Mentimeter tool used to conduct quiz	MID-II

Used the above stated activities and assessed the results through the students performance in their mid-1 and mid-2

Using online GDB COMPILER

Home page of student mobile ,using Online GDB compiler platform to execute a program.



Students solving problems in online GDB Compiler in their respective mobiles.

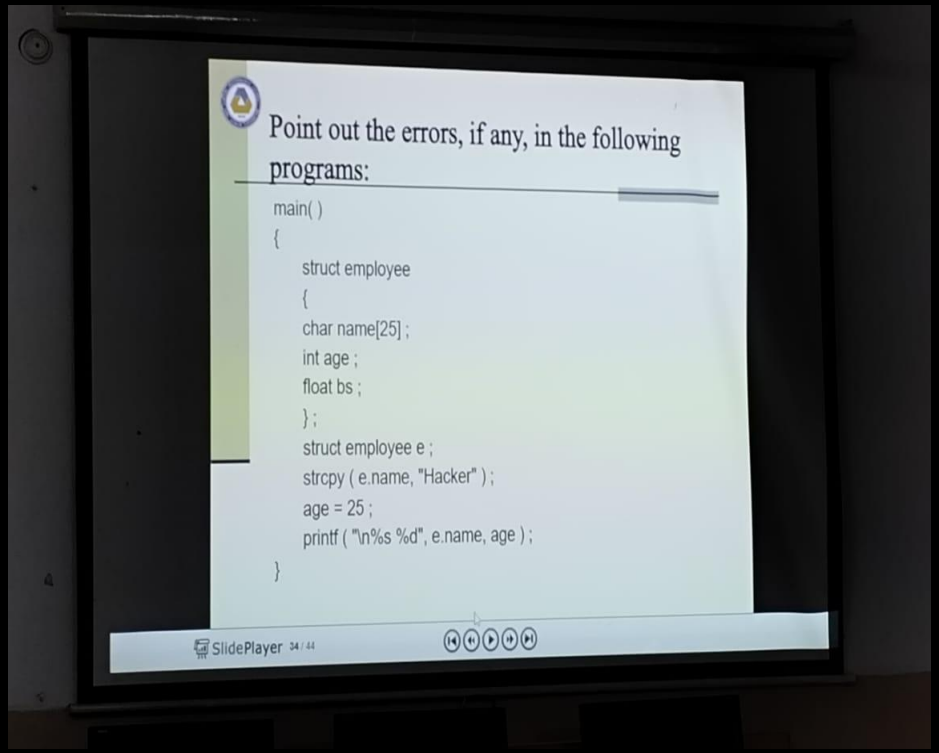
PRODUCTIVE UTILIZATION OF CLASS TIME IN BLENDED MODE

Problem faced: Inorder to overcome the difficulty faced by a weak student to understand a lengthy program and its execution.

- Total time allotted for each period = 50 minutes
- For taking attendance= 5 minutes
- For revising the previous class topics = 5min
- Effective class time left = 40 minutes which was not sufficient to make them understand the program execution
- This approach was done weekly once
- Method tried
- Used to take extra 10 minutes, from the next faculty also utilized sometimes the break time to cover difficult topics.

THINK-PAIR-SHARE ACTIVITY

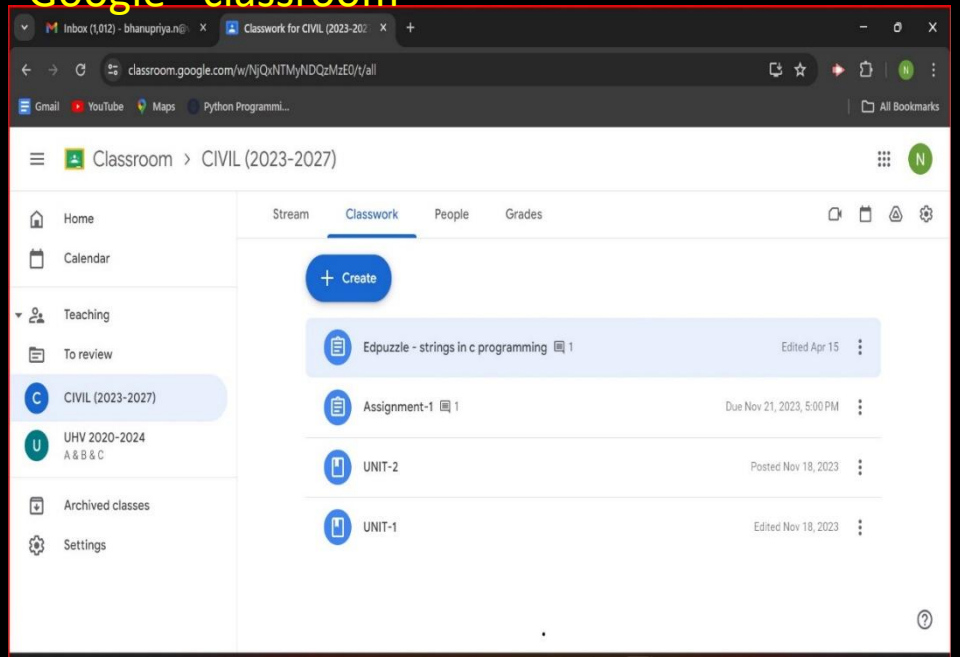
Using projector to conduct a group activity



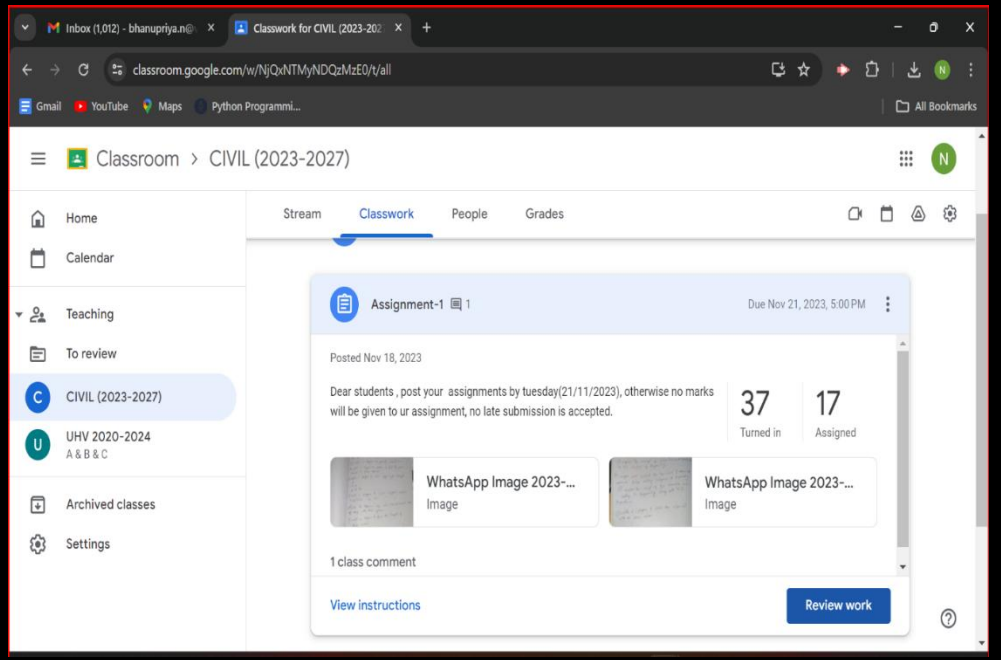
Solving programs in groups with the help of edpuzzle shared videos prior to the class

EFFECTIVE USAGE OF GOOGLE CLASSROOM FOR UPLOADING STUDY MATERIALS AND ASSIGNMENT'S

Subject material was shared to students Google - classroom

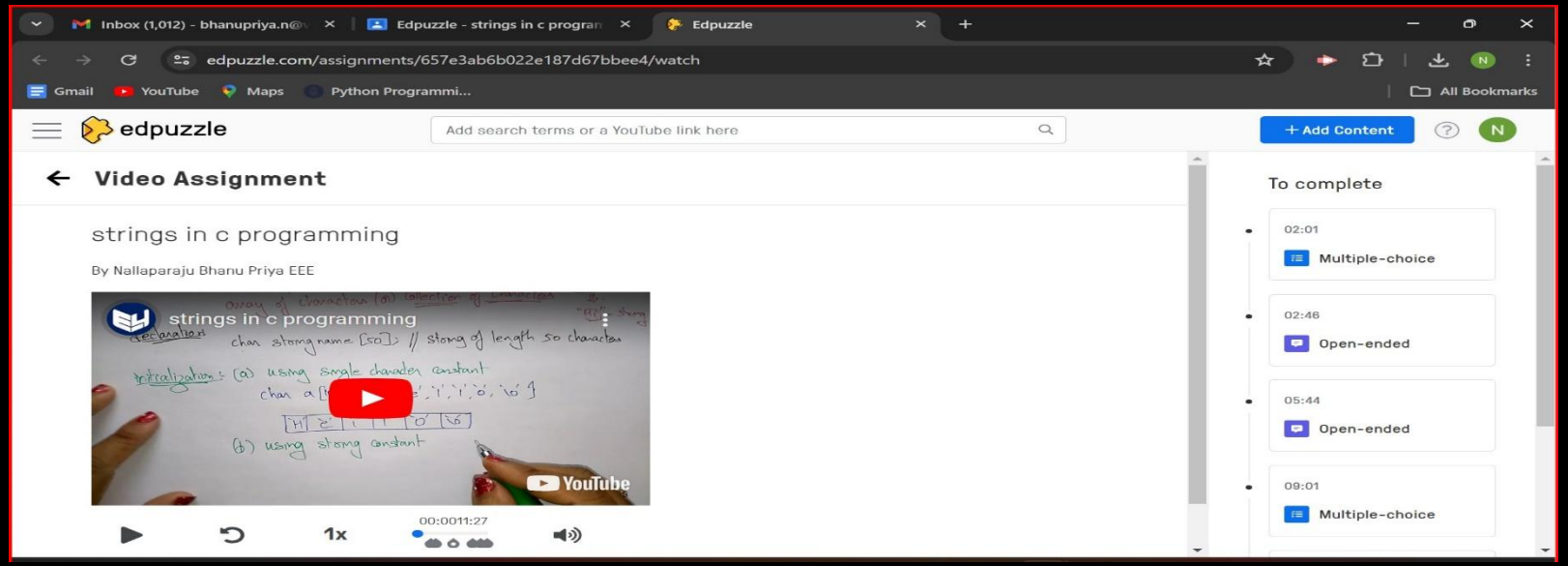


Students uploaded their assignments through Google-classroom

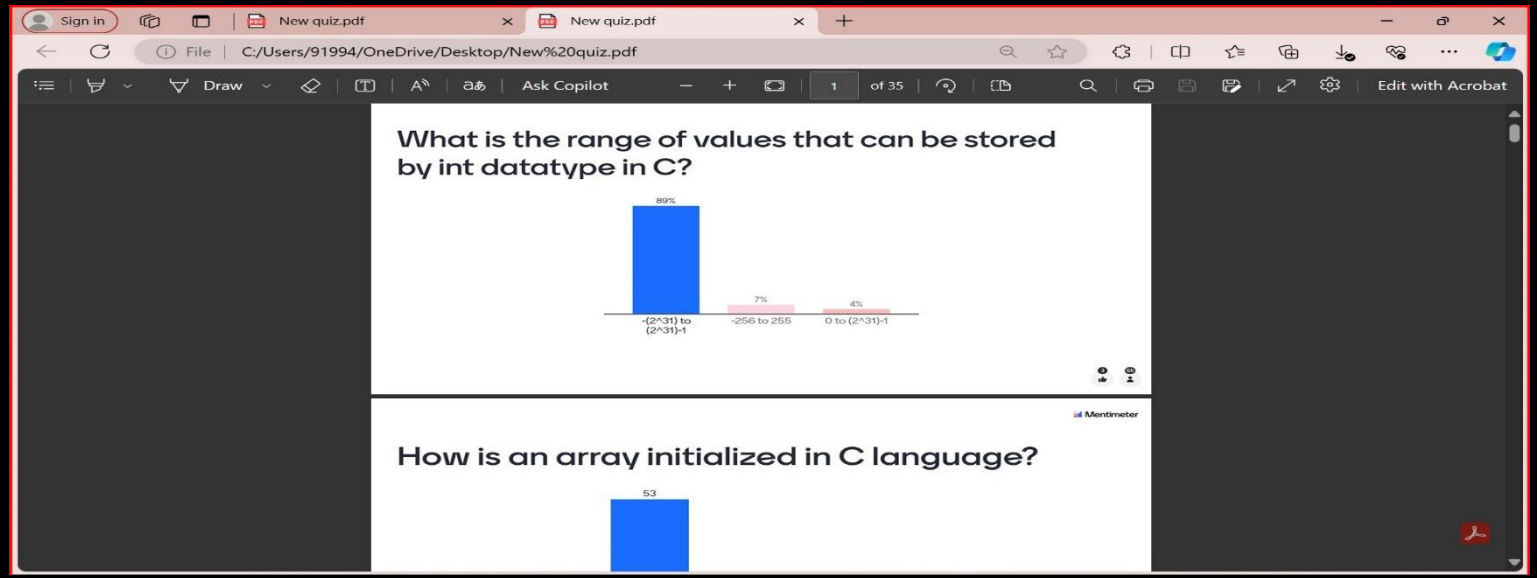


EDPUZZLE ACTIVITY on “strings”

Students were posed with open ended questions and MCQ’s on strings topic in Ed-puzzle activity

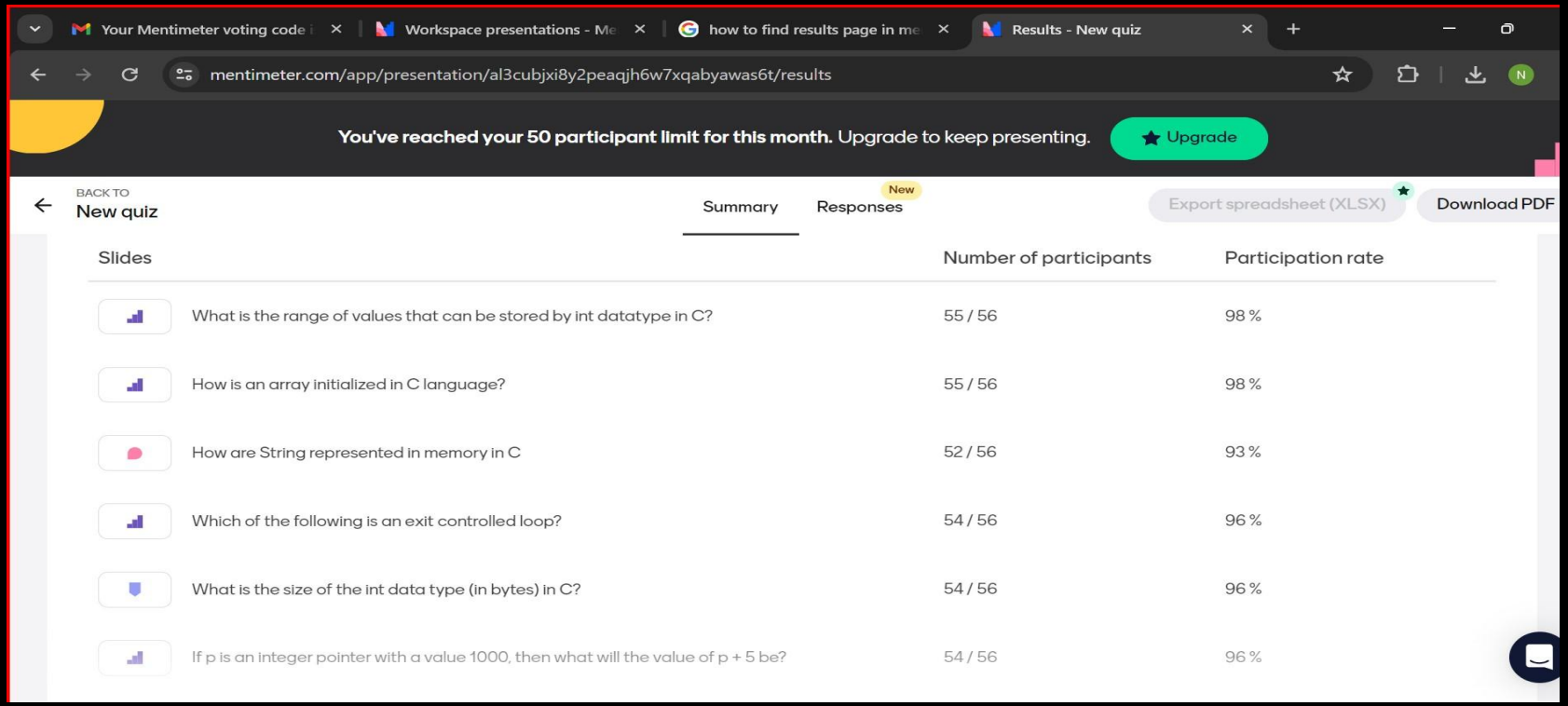


MENTIMETER as an Assessment Tool



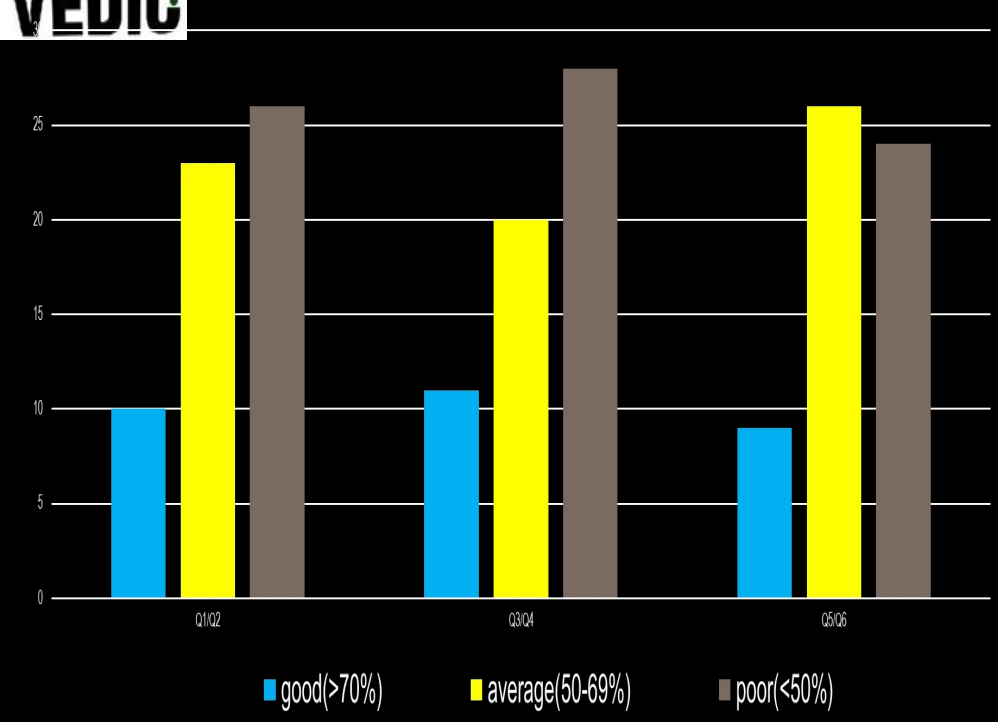
Mentimeter home page showing the responses of students to the questions posed

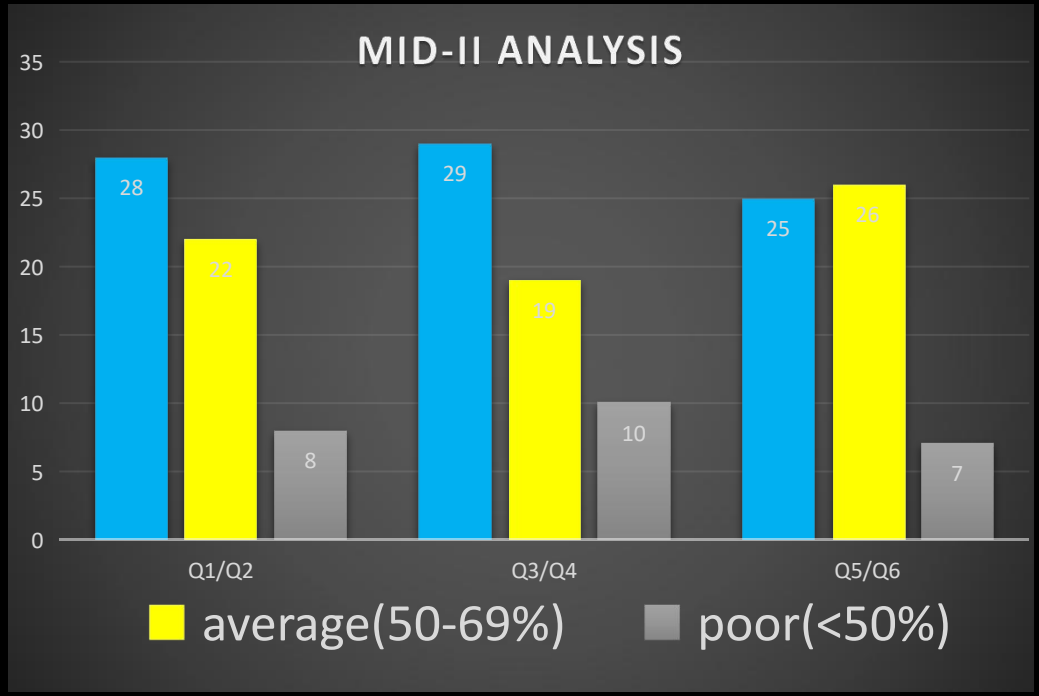
Assessment Design through Mentimeter



The above assessment shows the responses of students and their learnings through different activities

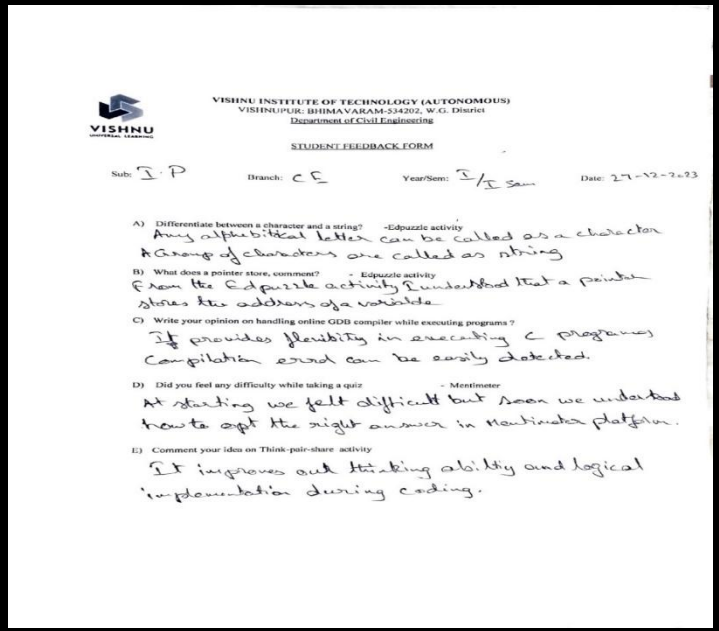
Assessment through MID exams





Students performance before and after conducting activities assessment done through their mid-1 and mid-2 exams

Impact – Reflection of Teaching



VISHNU INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
VISHNUPUR, BHIMAVARAM-534202, W.G. District
Department of Civil Engineering

STUDENT FEEDBACK FORM

Sub: I P Branch: C E Year/Sem: I/I Sem Date: 27-12-2023

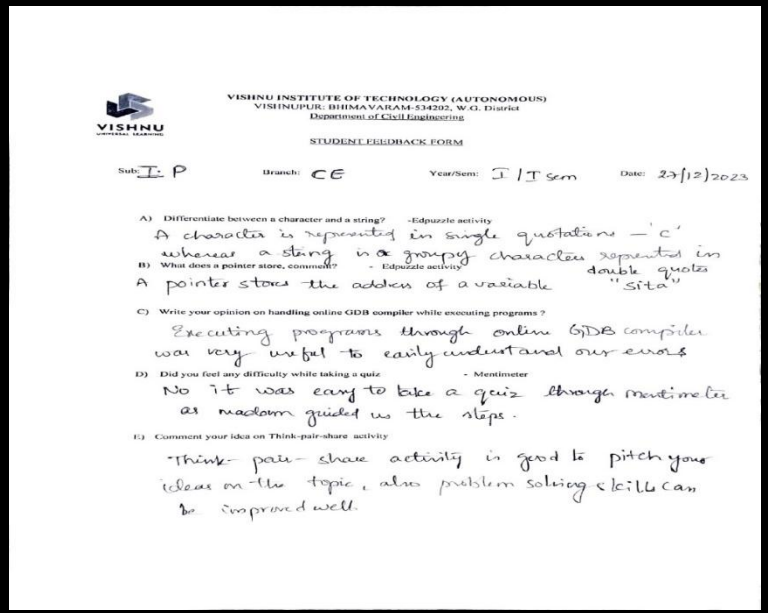
A) Differentiate between a character and a string? -Edpuzzle activity
Any alphabetical letter can be called as a character
A Group of characters are called as string

B) What does a pointer store, comment? - Edpuzzle activity
From the Edpuzzle activity I understood that a pointer stores the address of a variable

C) Write your opinion on handling online GDB compiler while executing programs ?
It provides flexibility in executing C programs
Compilation error can be easily detected.

D) Did you feel any difficulty while taking a quiz - Mentimeter
At starting we felt difficult but soon we understood how to opt the right answer in Mentimeter platform.

E) Comment your idea on Think-pair-share activity
It improves our thinking ability and logical implementation during coding.



VISHNU INSTITUTE OF TECHNOLOGY (AUTONOMOUS)
VISHNUPUR, BHIMAVARAM-534202, W.G. District
Department of Civil Engineering

STUDENT FEEDBACK FORM

Sub: I P Branch: CE Year/Sem: I/I sem Date: 27/12/2023

A) Differentiate between a character and a string? -Edpuzzle activity
A character is represented in single quotations — 'c'
whereas a string is a group of characters represented in double quotes "sita"

B) What does a pointer store, comment? - Edpuzzle activity
A pointer stores the address of a variable

C) Write your opinion on handling online GDB compiler while executing programs ?
Executing programs through online GDB compiler was very useful to easily understand our errors

D) Did you feel any difficulty while taking a quiz - Mentimeter
No it was easy to take a quiz through mentimeter as madam guided us the steps.

E) Comment your idea on Think-pair-share activity
Think- pair- share activity is good to pitch your ideas on the topic, also problem solving skills can be improved well.

sample student feedback on the activities implemented

SUMMARY OF THE ACTIVITIES

CO statement more	Bloom's Level	Activities	Assessment (when done)	Result/ Attainment
CO3 : Students are able to Implement various algorithms using the C programming language	L3	Ed-puzzle activity on strings concept	Assessment was done through MID-II exam	38 students out of 59 were able to get more than 65%
CO4 : Understand more advanced features of C Language	L2	Think-pair-share activity	Mentimeter tool was used for assessment and MID-II exam	40 students out of 59 were able to get more than 65%

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UNIVERSAL LEARNING

VEDIC

BVRIT

THANK YOU

Real time experience on curriculum labs through project based learning: case study

Presented by

Dr. V S N Narasimha Raju

Associate Professor,

Department of Electrical & Electronics Engineering

EEE, VIT, Bhimavaram

Name: Dr. V S N Narasimha Raju

Institution: Vishnu Institute of Technology, Bhimavaram

Department: Electrical and Electronics Engineering

Title of Presentation: **Real time experience on curriculum labs through project based learning**

Subject Taught: Internet of Things (IoT) lab

Year of Student: II-II

Number of Students in Class: 60+60

Need of Activity????

- ✓ Real time practical exposure
- ✓ Group culture
- ✓ Handle final year project
- ✓ Presentation skills
- ✓ Upper hand in Placements
- ✓ Engineering mindset

Implementation of Activity

4 interested students were trained rigorously and allotted as mentors

Formed 12 student batches (10 per batch) and given with different projects in electrical engineering and also given basic and necessary inputs.

Allow the students to explore and come up with solutions. Monitor the student groups closely and difficulties facing by students are addressed by mentors and resource person

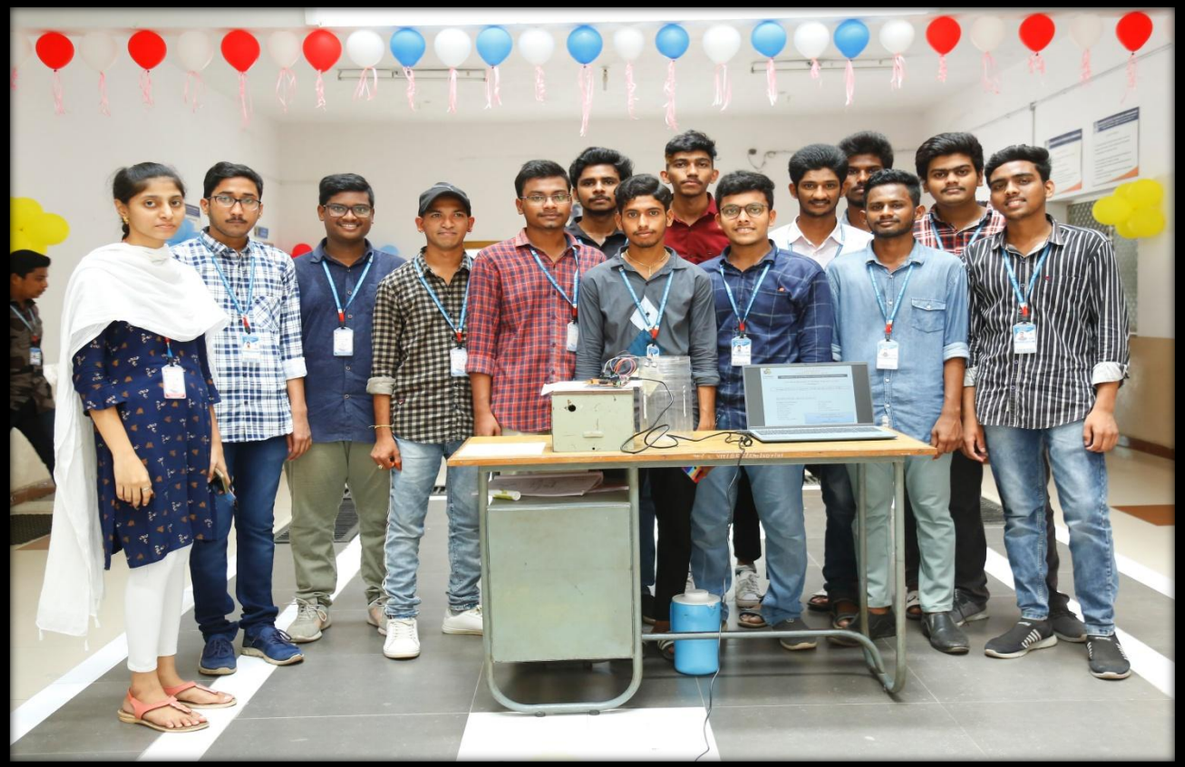
Last Day: Project expo followed by presentations

Evaluation, certificate distribution and feed back from students

Batch division

List of IoT projects and batches

BATCH	Title	Reg. no
A1	Alexa based home automation system **(Mentor:Kotesh)**	201,02,03,04,05,06,07,08,09,10,11
A2	Measurement of armature & field currents of DC shunt motor **(Mentor:Kotesh)**	212,13,14,15,16,17,18,19,20,21,22
A3	Measurement of AC current using ACS712 sensor **(Mentor:Kotesh)**	223,24,25,26,27,28,29,30,31,32
A4	Measurement of DC current using ACS712 sensor **(Mentor:Rohit)**	233,34,35,36,37,38,39,40,41,42,43,44
A5	IOT based gas detection system **(Mentor:Rohit)**	245,46,47,48,49,50,51,52,53,LE'S:201,02,03
A6	IOT based water level indicator using ultrasonic sensor **(Mentor:Rohit)**	204,05,06,07,08,09,10,11,12,13,14,15,16,17
B1	Measurement of AC voltage using ZMPTsensor **(Mentor:Prabhu)**	254,255,256,257,258,259,261,262,263,264,265
B2	Measurement of DC voltage using voltage sensor **(Mentor:Prabhu)**	266,267,268,270,271,272,273,274,275,276,277
B3	IoT based 3 point starterfor DC shunt motor **(Mentor:Prabhu)**	278,279,280,281,282,283,284,285,286,287,288
B4	IoT based temperature & humidity system **(Mentor:Deva)**	289,290,291,292,293,294,295,296,297,298,299
B5	IR speed sensor (RPM of a Electrical motor) **(Mentor:Deva)**	2A0,A1,A2,A3,A4,A5,A6,LE'S:218,19,20,23
B6	Measurement of AC current using clamp type CT coil (SCT013) **(Mentor:Deva)**	221,22,24,25,26,27,28,29,30,31,32,33



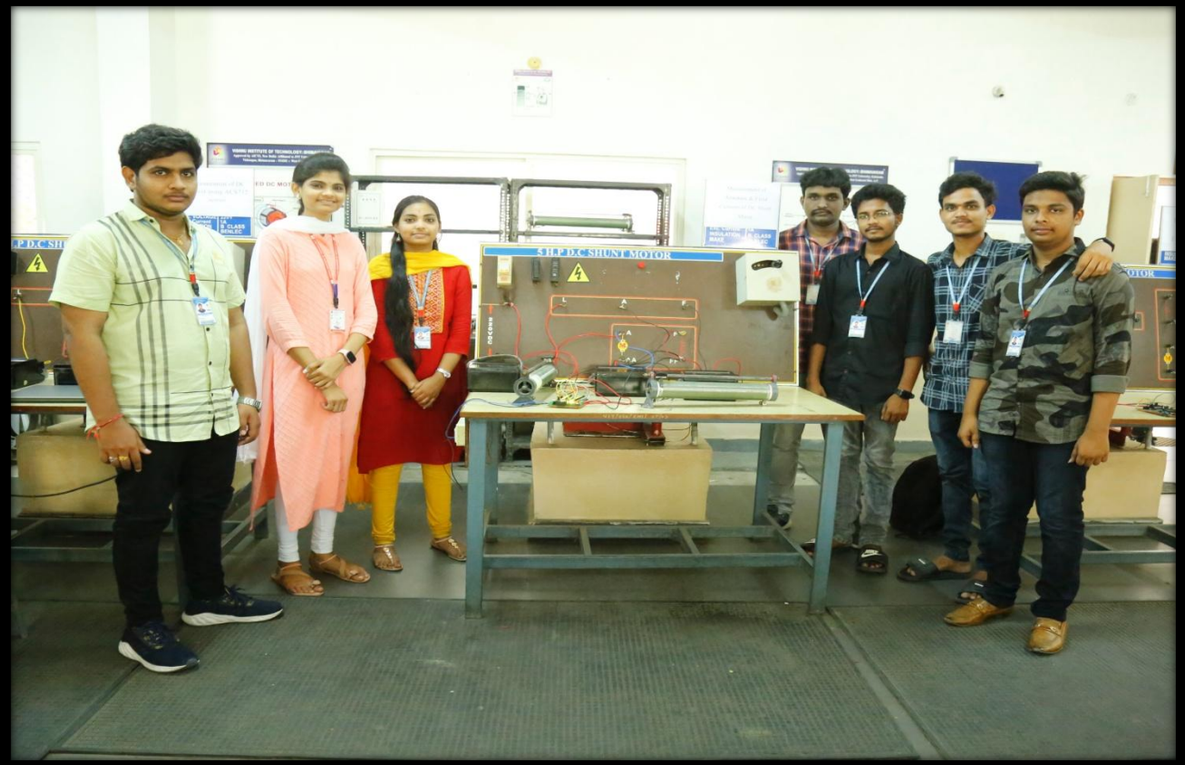

3 HP DC SHUNT MOTOR


3 HP DC SHUNT MOTOR
Measurement of DC Voltage Using Voltage Sensor

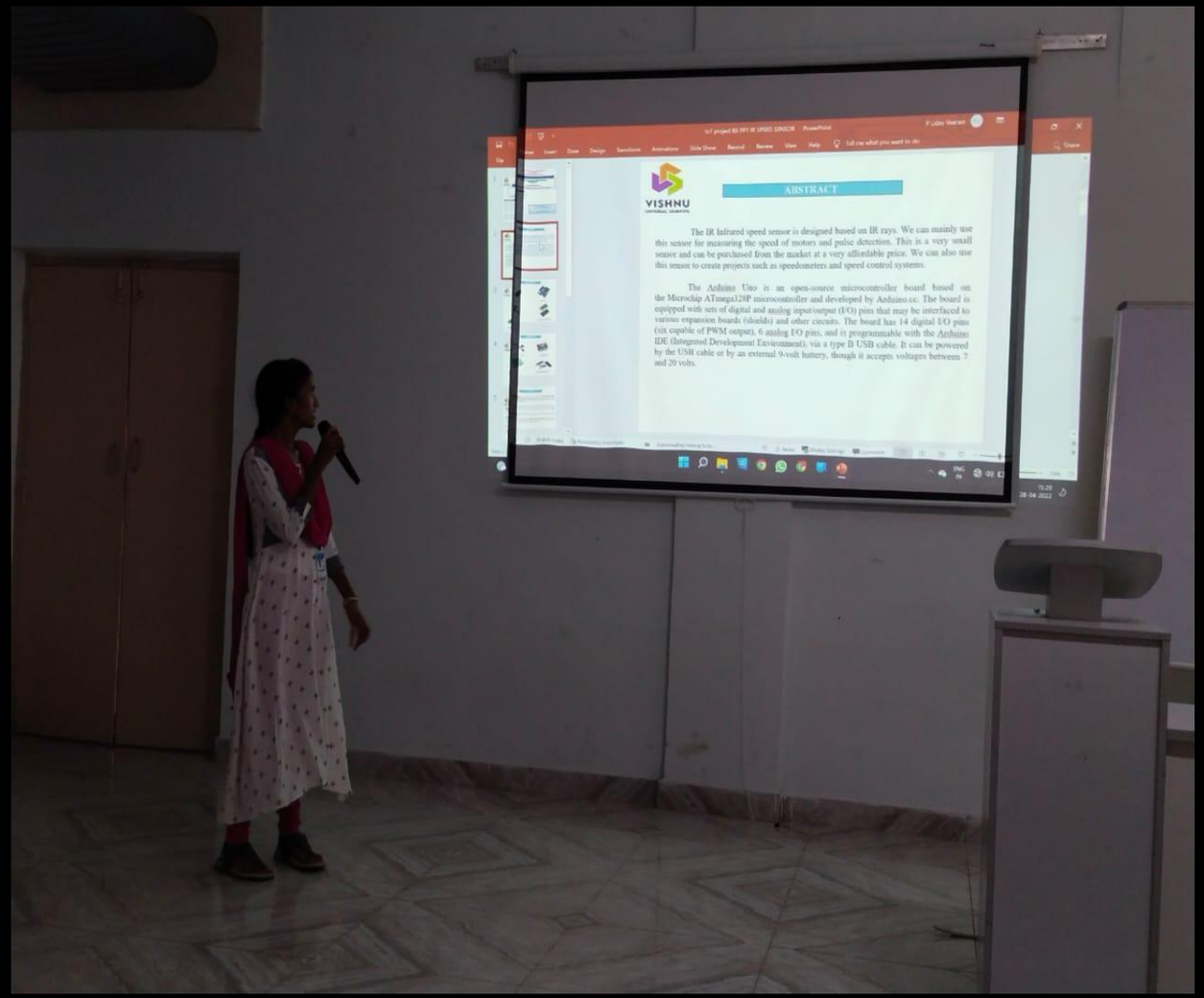

DC SHUNT MOTOR


HP 1 PHASE CAP START,CAP RUN INDUCTION MOTOR
230VAC


3 HP DC COMPOUND MOTOR


3 HP DC SHUNT MOTOR

Project Presentations

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WELCOME
A Two Week Worksho
on
April 2022


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Evaluation of projects

II year IoT projects evaluation sheet

BATCH	Title	Concept	Hardware	Presentation	Final marks
A1	Alexa based home automation system (Kotesh)	5	4	3	12
A2	Measurement of armature & field currents of DC shunt motor(Kotesh)	5	4	4	13
A3	Measurement of AC current using ACS712 sensor (Kotesh)	5	5	3	13
A4	Measurement of DC current using ACS712 sensor (Rohit)	5	3	5	13
A5	IOT based gas detection system(Rohit)	5	2	3	10
A6	IOT based water level indicator using ultrasonic sensor(Rohit)	5	3	5	13
B1	Measurement of AC voltage using ZMPTsensor (Prabhu)	5	4	4	13
B2	Measurement of DC voltage using voltage sensor (Prabhu)	5	4	4	13
B3	IoT based 3 point starter for DC shunt motor (Prabhu)	5	5	5	15
B4	IoT based temperature & humidity system (Deva)	5	3	4	12
B5	IR speed sensor (RPM of a Electrical motor)(Deva)	5	5	4	14
B6	Measurement of AC current using clamp type CT coil (SCT013)(Deva)	5	4	5	14

Panel members

Dr. S. Pragaspathy

Mr. P. Naveen

II year IoT projects

BATCH	Title	Reg. no
A1	Alexa based home automation system (Kotesh)	201,02,03,04,05,06,07,08,09,10,11
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B5	IR speed sensor (RPM of a Electrical motor)(Deva)	2A0,A1,A2,A3,A4,A5,A6,LE'S:218,19,20,23
B6	Measurement of AC current using clamp type CT coil (SCT013)(Deva)	221,22,24,25,26,27,28,29,30,31,32,33

Special appreciation for extremely well performed batch

Course Outcomes:

- Apply various technologies of Internet of Things to real time applications
- Apply various communication technologies used in the Internet of Things
- Connect the devices using web and internet in the IoT environment
- Implement IoT to study Smart Home, Smart city, etc

Feed back from students

Students Feedback Form

Academic year: 2021-2022
Date of Feedback: 28/04/2022
Branch : EEE(II-II)
Section : A
Batch no: A2

1) How do you rate the contents covered in laboratory and project work? **(Not satisfactory/Average/Good/Excellent)**

2) Pace on which contents were covered? **(Slow/Moderate/Fast)**

3) Do you believe, the work what you did for last 20 days is useful? **(Yes/No)**

4) Rate the mentors **(Not satisfactory/Average/Good/Excellent)**

5) Rate the faculty **(Not satisfactory/Average/Good/Excellent)**

6) Write if any

very informative workshop

Students Feedback Form

Academic year: 2021-2022
Date of Feedback: 28-4-22
Branch : EEE(II-II)
Section : B
Batch no: B5

1) How do you rate the contents covered in laboratory and project work? **(Not satisfactory/Average/Good/Excellent)**

2) Pace on which contents were covered? **(Slow/Moderate/Fast)**

3) Do you believe, the work what you did for last 20 days is useful? **(Yes/No)**

4) Rate the mentors **(Not satisfactory/Average/Good/Excellent)**

5) Rate the faculty **(Not satisfactory/Average/Good/Excellent)**

6) Write if any

Very good workshop, we want more workshops
Thank you sir for conducting these kind of workshops

Students Feedback Form

Academic year: 2021-2022
Date of Feedback: 28/04/2022
Branch : EEE(II-II)
Section : B
Batch no: B4

1) How do you rate the contents covered in laboratory and project work? **(Not satisfactory/Average/Good/Excellent)**

2) Pace on which contents were covered? **(Slow/Moderate/Fast)**

3) Do you believe, the work what you did for last 20 days is useful? **(Yes/No)**

4) Rate the mentors **(Not satisfactory/Average/Good/Excellent)**

5) Rate the faculty **(Not satisfactory/Average/Good/Excellent)**

6) Write if any

More practical knowledge gained sir.
current measurment and voltage measurment in lab are good.
More IOT projects we want. thank you very much Sir

Students Feedback Form

Academic year: 2021-2022
Date of Feedback: 28/04/2022
Branch : EEE(II-II)
Section : A
Batch no: A4

1) How do you rate the contents covered in laboratory and project work? **(Not satisfactory/Average/Good/Excellent)**

2) Pace on which contents were covered? **(Slow/Moderate/Fast)**

3) Do you believe, the work what you did for last 20 days is useful? **(Yes/No)**

4) Rate the mentors **(Not satisfactory/Average/Good/Excellent)**

5) Rate the faculty **(Not satisfactory/Average/Good/Excellent)**

6) Write if any

We got practical exposure by attending this workshop
We want every semester one workshop.

THANK YOU

Electric Circuits Concepts: A Comparative Analysis of MATLAB-Enhanced Learning with traditional learning for B.Tech. Students

PRESENTED BY

IDAMAKANTI KASIREDDY

Associate Professor,

EEE, VIT, Bhimavaram.

VITB
ESTD 2008
Vishnu Institute of Technology
Bhimavaram

VEDIC

Name: IDAMAKANTI KASIREDDY

Institution: Vishnu Institute of Technology, Bhimavaram

Department: Electrical and Electronics Engineering

Title of Presentation:Electric Circuits Concepts: A Comparative Analysis of MATLAB-Enhanced Learning for B.Tech. Students

Subject Taught: Skill oriented course on electrical circuits using MATLAB tool

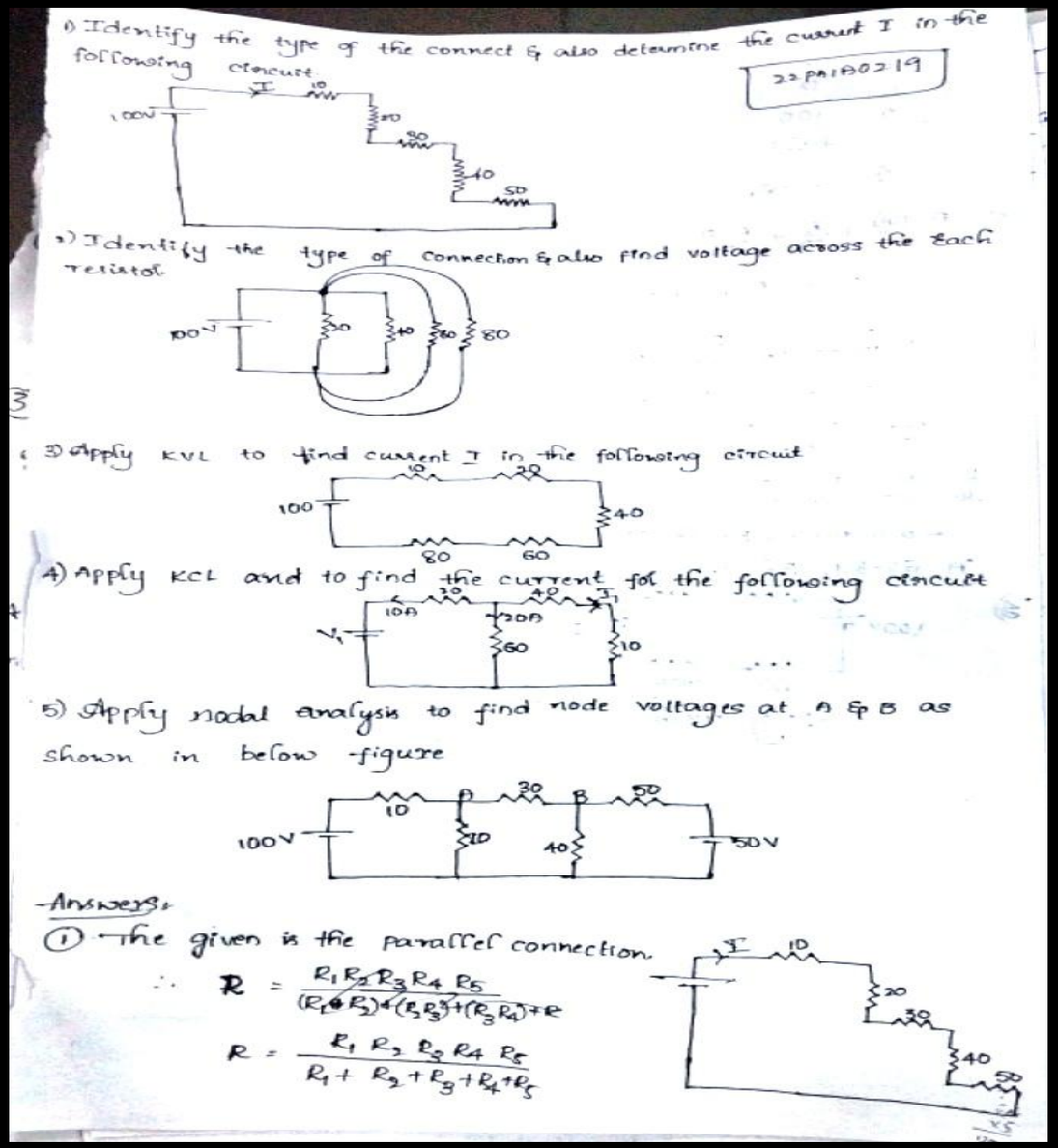
Year of Student: II-I

Number of Students in Class: 66

Importance of Understanding Electric Circuits

- Electric circuits are fundamental to electrical engineering, serving as the backbone for designing and analyzing electrical systems.
- Solving circuit problems enhances analytical thinking and fosters innovative solutions.
- Understanding circuits is crucial for ensuring safety and reliability in electrical systems
- Understanding electric circuits is a prerequisite for excelling in more advanced electrical engineering subjects. It forms the basis for higher-level courses in electronics, power systems, network theory, etc..

Initial Screening



1) Identify the type of the connect & also determine the current I in the following circuit

22PA1A0219

2) Identify the type of connection & also find voltage across the each resistor.

3) Apply KVL to find current I in the following circuit

4) Apply KCL and to find the current for the following circuit

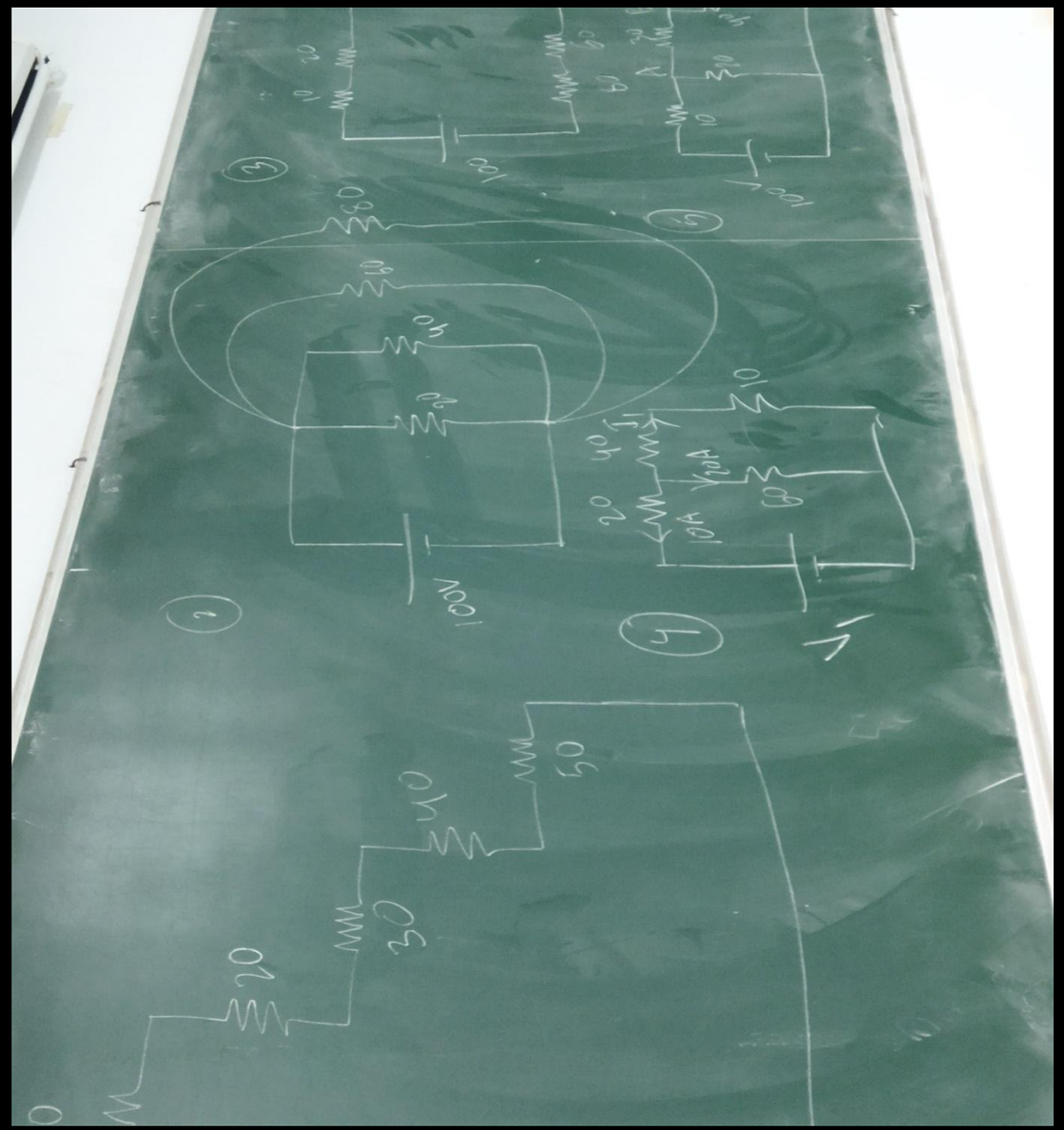
5) Apply nodal analysis to find node voltages at A & B as shown in below figure

Answers:

(1) The given is the parallel connection.

$$\therefore R = \frac{R_1 R_2 R_3 R_4 R_5}{(R_1 R_2)+(R_3 R_4)+(R_3 R_4)+R}$$

$$R = \frac{R_1 R_2 R_3 R_4 R_5}{R_1 + R_2 + R_3 + R_4 + R_5}$$



Students are solving problems

Challenges Faced by B.Tech Students (after evaluation of answer sheets)

- Some students are unable to identify the type of connection(like series or parallel connection)
- Visualizing circuit behavior and grasping the flow of electricity through components can be difficult for some students.
- Some students are unable to apply principles to electrical circuits to get current/voltage
- Some students are not able to find voltages at various nodes

Students performance Report

- 22PA1A0219 Performance: Solid understanding of KVL and KCL, faced challenges with complex parallel and series circuits.
- 22PA1A0225 Performance: applied mesh analysis techniques to simple circuits, needs more practice with complex circuits.
- 22PA1A0231 Performance: good theoretical understanding of nodal analysis, made minor errors in applying the same to circuits to get node voltages.
- 22PA1A0242 Performance: Struggled with both KVL and KCL, needs more practice to improve performance.
- 22PA1A0201 Performance: Average performance across all areas

- 22PA1A0207 Performance: good understanding of KVL and KCL, but unable to apply to circuits (mesh analysis).
- 22PA1A0261 Performance: Excellently applied series and parallel techniques, faced some challenges with nodal analysis.
- 22PA1A0259 Performance: Struggled with both series and parallel concepts.
- 22PA1A0251 Performance: Above-average performance in all areas, with minor errors in combining series-parallel circuits.
- 22PA1A0236 Performance: good understanding of mesh analysis, but unable to apply to circuits .

Objectives of the Activity

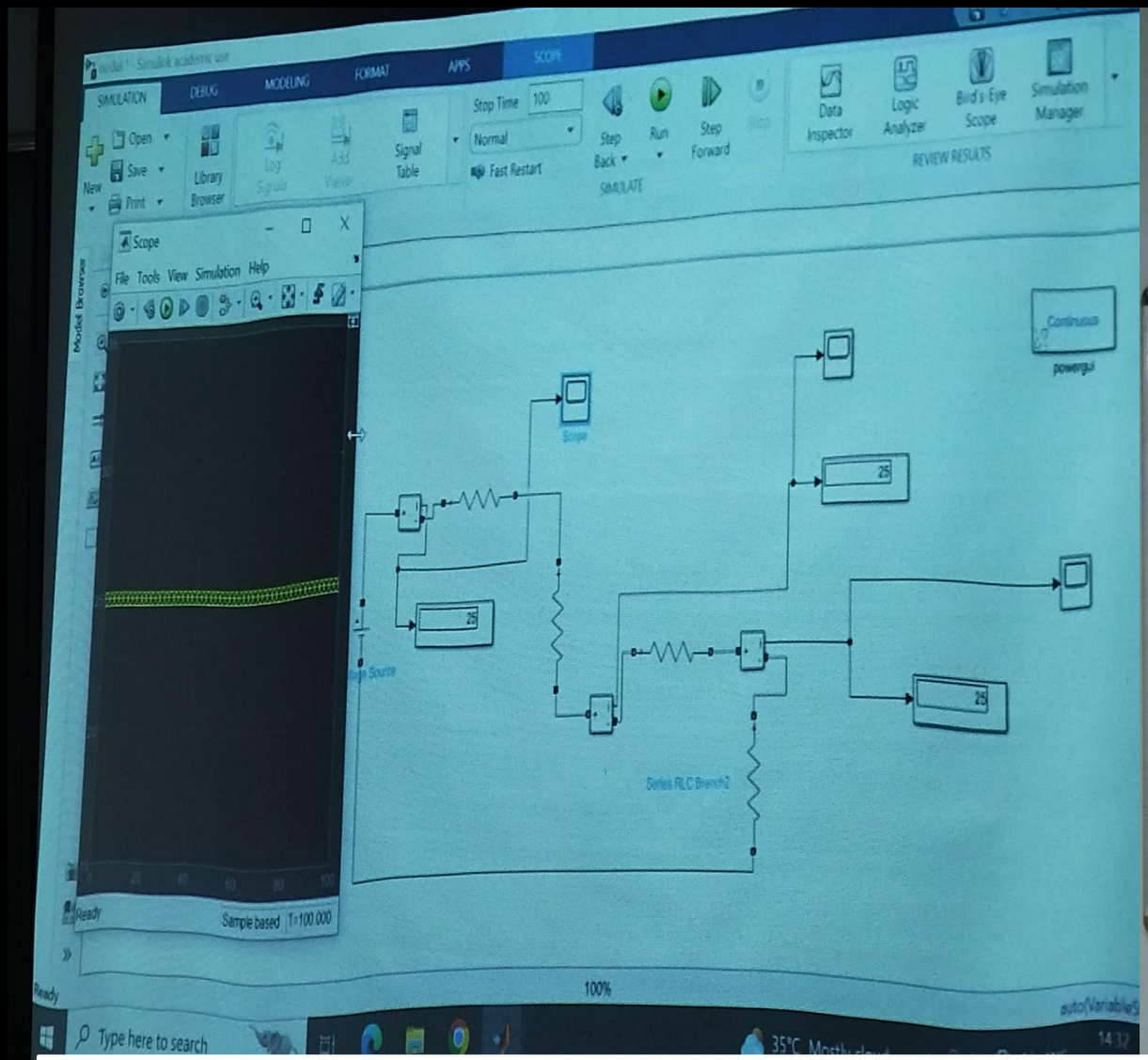
- To conduct a comparative analysis between the traditional teaching approach without MATLAB and the approach that integrates MATLAB-enhanced learning for electric circuits concepts.
- To showcase the advantages of using MATLAB as a powerful tool for enhancing learning outcomes, visualization, problem-solving, and understanding complex electric circuits.
- To identify the challenges faced by B.Tech students in learning electric circuits and explore how MATLAB-based learning can address these challenges effectively.

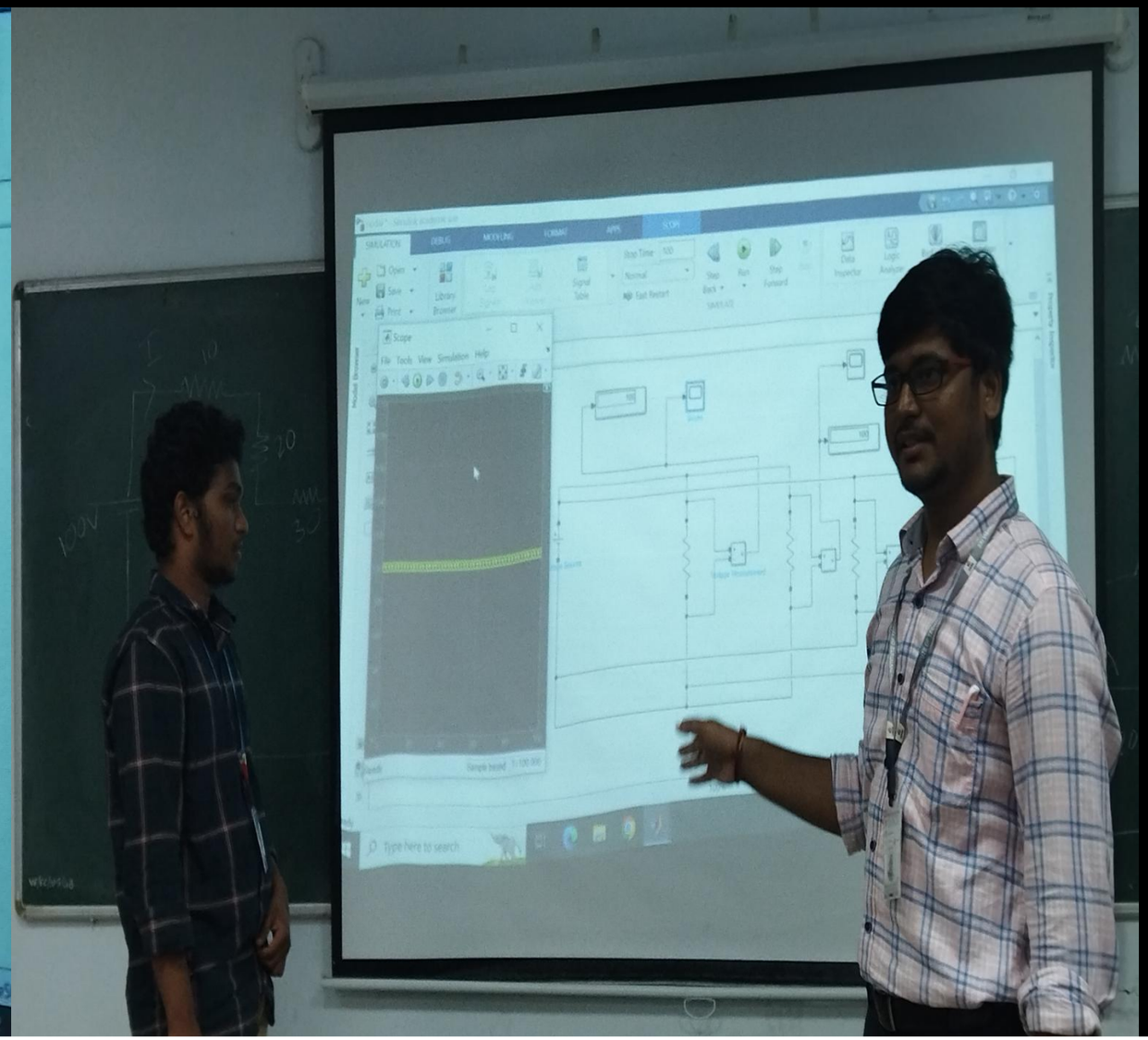
Advantages of MATLAB-Enhanced Learning for Electric Circuits Concepts

- MATLAB offers an interactive learning environment, allowing students to actively engage with circuit concepts through simulations and visualizations.
- Interactive learning fosters curiosity, exploration, and deeper understanding of electric circuits principles.
- MATLAB simulations provide real-time insights into circuit behavior, allowing students to observe and analyze circuits in action.
- Students can experiment with various circuit parameters and observe the effects on voltage, current, and other variables.
- Proficiency in MATLAB enhances their employability and adaptability in the engineering industry.

Demonstrations of MATLAB Simulations for Electric Circuits

- MATLAB simulation of Series circuits
- MATLAB simulation of parallel circuits
- Visualization of voltages and currents through display block
- Visualization of voltages and currents through Scope block
- Voltage and current measurement using voltage and current measurement blocks





Demonstrations of MATLAB Simulations for Electric Circuits

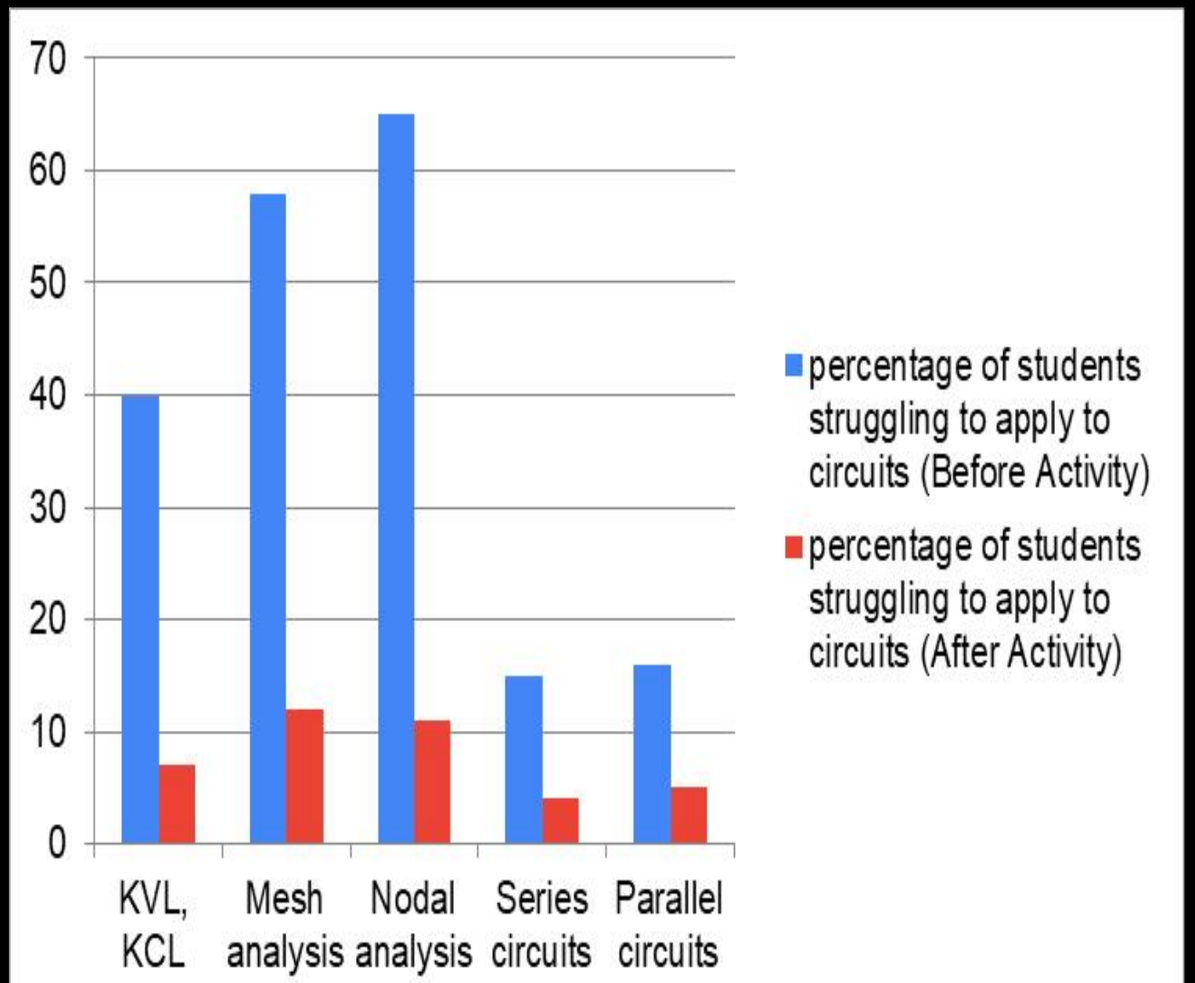
Visualizing the circuit operation

Impact of Activity after MATLAB based learning

Roll Number	Trained Performance
22PA1A0210	Improved understanding, KCL progress
22PA1A0214	Enhanced overall, nodal analysis advancement
22PA1A0215	Strong KVL/KCL, improved mesh analysis
22PA1A0217	Solid series-parallel, better nodal analysis
22PA1A0218	Fewer errors in series-parallel, mesh gains
22PA1A0225	Enhanced KVL/KCL, better handling of mesh
22PA1A0210	Further grasp of series/parallel, nodal gains
22PA1A0227	Above-average, improved series-parallel
22PA1A0241	Excellent nodal analysis, better mesh skills
22PA1A0219	Overcame KVL/KCL struggles, better concepts
22PA1A0226	Improved KVL/KCL, handling complex parallel

Roll Number	Trained Performance
22PA1A0202	Enhanced mesh analysis, better series skills
22PA1A0209	Good nodal analysis, minor series-parallel
22PA1A0262	KVL/KCL improvements, better understanding
22PA1A0239	Average overall, concept application improved
22PA1A0237	Strong KVL/KCL, better mesh analysis
22PA1A0229	Strengthened series/parallel, nodal progress
22PA1A0221	Overcame series/parallel challenges, gains
22PA1A0220	Above-average, minor series-parallel progress
22PA1A0205	Improved nodal analysis, better mesh skills

Comparative analysis



Methods/Concepts	% of Students Struggling (Before Activity)	% of Students Struggling (After Activity)
KVL, KCL	40	7
Mesh analysis	58	12
Nodal analysis	65	11
Series circuits	15	4
Parallel circuits	16	5

THANK YOU