

# Implementation of Active Learning Strategies at MLR Institute of Technology, Hyderabad - A Best Practice

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**Abstract:** Teacher Centred learning has been the traditional method of teaching. In this method of teaching, the Learning tends to be passive and the learners play little part in the learning process. The information flow is one-way with insufficient interaction with students in the Class Room. To overcome a number of shortcomings observed in the Teacher –Centred Learning, the focus of instruction needs to be shifted from Teacher –Centred Learning to Student-Centred Learning. There are a number of approaches to implement Student-Centred Learning in the curriculum. We have chosen Active Learning Strategies as an Instructional approach to implement Student-Centred Learning at MLR Institute of Technology-Hyderabad. As a first step, we have selected the five Active Learning Strategies to implement: 1) Flipped Class Room 2) Think-Aloud-Pair-Problem-Solving (TAPPS) 3) In-Class Teams 4) Group writing Assignments and 5) Collaborative Learning. Ten IUCEE-IIIECP certified faculty have been designated as mentors to monitor the implementation process for the smooth and effective conduct of Active Learning Strategies. The Active Learning Reports are compiled in the specified template by the faculty after completion of the activity every month. The reports are evaluated by the mentors

to assess their compliance vis-a-vis the requirements stipulated in the SOPs. Based on the outcome of assessments, the faculty are provided the guidance/training to overcome the observed deficiencies. The faculty in the college have started the implementation of Active Learning Strategies w.e.f July 2017. The students have responded positively to this Active Learning Pedagogy.

**Keywords:** Student Centred Learning, Active Learning Strategies, Standard Operating Procedure, Active Learning Report, Assessment Report.

## 1. Introduction

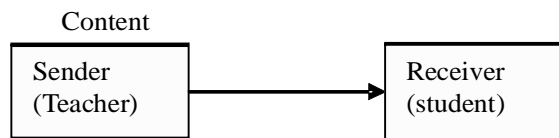
The classical system of teaching using chalk-and-talk has been supplemented by a number of evolutionary methods of teaching to make education more effective. These methods include E-learning, on-line education and many other blended learning techniques. The focus of these techniques has been mainly Teacher- Centred Learning, which has been the traditional method of teaching. In Teacher-Centred method of teaching, the teacher controls the instructional process, the content is delivered to the entire class and the teacher tends to emphasize factual knowledge. In other hands, the teacher delivers the lecture content and the student listen to the lecturer. Thus the learning mode tends to be passive and learners play little part in their learning process. In such a lecture, students concentration starts dropping after 15-20 minutes and at the end of the session, it may fall down to zero. The Teacher- Centred method

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of teaching is a “one way flow” of information and there is insufficient interaction with students in the class room (Figure 1).



**Fig 1. One-way-flow with no student interaction**

Teacher-Centred method of teaching has a number of shortcomings. To overcome these shortcomings, the focus is to shift learning from Teacher-Centred to Student-Centred for better participation of students in the learning process. Student-Centred learning also known as Learner-Centred method of teaching broadly encompasses methods of teaching that shift the focus of instruction from the teacher to the student. Student-Centred learning aims to develop learner autonomy and independent by putting responsibility for the learning path in the hands of students and acknowledging student voice as central to the learning experience. In a Student-Centred learning space, students choose what they will learn, how they will learn and how they will assess their own learning.

The Student-Centred learning refers to a wide variety of educational programs, learning experience, instructional approaches, and academic support strategies that are intended to address the distinct needs, interests and aspiration of students [1]. We have chosen five Active Learning Strategies as an instructional approach to implement Student-Centred learning at MLR Institute of Technology, Hyderabad. The five selected Active Learning Strategies are 1) Flipped Class room, 2) Think-aloud-pair-problem solving, 3) In Class Teams, 4) Group Writing Assignments and 5) Collaborative Learning. In this paper, we will discuss Standard Operating Procedure (SOP) to conduct the five Active learning Strategies, its implementation, assessment and Outcomes.

## 2. Standard Operating Procedure to conduct Active Learning Strategies.

A number of Active Learning Strategies have been defined by different authors over a period of time. We have chosen the five important Active Learning Strategies for implementation at MLR, Institute of Technology, Hyderabad. These are listed below:

### 1) Flipped Class Room

- 2) Think-aloud-pair-Problem Solving(TAPPS)
- 3) In-Class Teams
- 4) Group Writing Assignments
- 5) Collaborative Learning.

Though the material describing the above activities is available on the internet, it is scattered and sketchy. We decided to write the Standard Operating Procedures (SOPs) to conduct these Active Learning strategies so that the complete material to conduct the activities is available in one document compiled in a standard format.

Ten faculty members of MLR, Institute of Technology have attended the IUCEE-IIIECP certification program. The program was conducted in two phases (phase-I, phase-II) covering the period from June 2016 to January 2017. The program constitutes training of the faculty for implementation of Active Learning Strategies in the Engineering Education.

The Ten faculty members have successfully completed phase-I and phase-II of the program and have been awarded certification. We decided to utilize the services of these certified faculties to write Standard Operating Procedure to conduct the Active Learning Strategies as per the format given below:

- 1) Introduction
- 2) Objective
- 3) Procedure
- 4) Expected Outcomes
- 5) Enclosure for Assessment
- 6) References

**Table 1.**

Name of faculty	SOP prepared
Dr. V Radhika Devi, Assoc.Professor	Think-aloud-pair-problem solving(TAPPS) [2]
Mr. M V Babu, Asst.Professor	Flipped Class Room [3]
Mr. Y Madan Reddy, Asst.Professor	In-Class Teams [4]
Mr. D V Surya Chandra Babu, Asst.Professor	Group Writing Assignments [5]
Mr. P Ram Mohan Rao, Assoc. Professor	Collaborative Learning [6]

The SOPs have been compiled by the IUCEE certified faculty as shown in Table 1.

### 3. Implementation

The SOPs to conduct the Active Learning Strategies have been issued to all the faculty members of this college in the beginning of the academic year. Further, the SOPs have been posted on the college website ([www.mlrinstitutions.ac.in](http://www.mlrinstitutions.ac.in)) for reference by the faculty. We have started the implementation process from the academic year 2017-18, commencing July 2017. The implementation process is described in succeeding paragraphs.

#### A. Nomination of certified faculty as mentors

Ten certified faculty have been designated as mentors for training of the faculty and for assessment of Active Learning Reports. These mentors belong to the different departments of the college viz CSE/IT, ECE, Aero, MECH and H&S. We decided to divide the number of faculty in the department into groups, each group consisting of not more than 20 faculty. The size of the group was decided based on the strength of the department and the number of mentors available in the department. Further, we found that the group size of 20 is ideal from mentoring point of view. The distribution of mentors department-wise for the purpose of training and assessment of Active Learning Reports is shown in Table 2.

**Table 2: Nomination of Mentors**

Dept	Name of the mentor	No. of faculty allocated
ECE	Mr. D S Chandra Babu, Asst.Professor	20
	Mr. A Laxmana Siridhara, Asst.Professor	20
CSE/IT	Mr. P Daykar, Assoc.professor	17
	Mr. P Ram Mohan Rao, Assoc.Professor	15
	Mr. Y Madan Reddy, Asst.Professor	14
Aero	Mr. N Prabhu Kishor, Assoc.Professor	20
Mech	Mr. T Mastan Vali Babu, Asst.Professor	21
	Ms. A Nalini Deepthi, Asst.Professor	21
H&S	Dr. V Radhika Devi, Assoc.Professor	17
	Ms. G Prashanthi, Asst.Professor	18

#### B. Mentors' Responsibility

The mentors have been assigned the responsibility of the following tasks:

- Training of the allocated faculty
- Assessment of the Activity Report every month to find out noncompliance, if any.

- Briefing faculty about the noncompliance
- Providing guidance to the faculty to prevent noncompliance in future
- Retraining of the allocated faculty to achieve full compliances in the stipulated time frame of one year.

The Nominated mentors have conducted the FDP for the allocated faculty in the month of June 2017. After the completion of FDP, the faculty of this college has been instructed to conduct minimum one Activity every month. Further, they have been informed that the same Activity will not be repeated in the succeeding months. To motivate the faculty to implement the Active Learning Strategies, an incentive of 5% of their basic pay has been sanctioned to be added to their monthly salary on successful completion of one activity in the previous month.

### 4 Assessment of Activity Report

The Faculty, who have conducted the Activity Learning Strategy in the previous month, are required to compile the complete information pertaining to the activity in the

"Activity Learning Report" as per the template shown in Table 3.

**Table 3: Template for Active Learning Report**

Name of the faculty:	Designation:	Subject:
Year/semester:	Section:	Topic:
Name of the Activity:	Date :	No. of students attended:
Objective of the Activity:		
Execution Plan:		
Expected Outcomes:		
Enclosures: Video/ Photos / material		
Feedback from students: Useful or not		
Suggestions/improvement expected by the students		

A sample filled-in Active Learning Report is shown below:

Name of the Faculty: Alekhya.N	Designation: Asst. Prof	Subject: Engineering Drawing
Year/ Semester: I/II	Section: ECE-D	Topic: Engineering Curves(Cycloid, Epicycloid, Hypocycloid)
Name of the activity: In-Class Teams (Peer Evaluation)	Date: 28/08/2017	No. of students attended: 52

**Objective of the activity**

1. To what extent the students have understood the concept?
2. To enable students to analyse the taught procedure and need to apply that knowledge to solve the problem.

**Execution Plan****Time management:**

Class time: 50 min

Teaching the concept - 20min

Describing about the activity and dividing the class into groups having two/three persons for each- 5min

Time given for thinking and to answer – 10min

Exchange of the answer scripts and Explanation of the correct answer- 10 min

Peer Evaluation-5min

**Plan of action**

The concept will be taught and the class will be divided into groups such that the two or three persons will be sitting per bench which is a group. Then the question will be given to the students such that it is an higher order thinking question which makes student to think and answer. Then after the students are given time to solve the question in their own way by discussing with their team. Then the faculty will be asking them to exchange their answers with the other teams and explain about how to evaluate. The faculty will solve the question on the board and will ask the students to evaluate. The team which solves the question correctly will be the winner.

**Expected Outcomes**

1. After the activity the student can be able to answer any sort of difficult or application question
2. After the activity the student can be able to know the different approaches to the solve the given question
3. After the activity the faculty can understand each student way of thinking and method of problem solving which improves the teaching process

**Enclosures Video/Photos while conducting the activity/Photos and papers written by students are attached**

Report is graded Full Compliance (FC), Partial Compliance (PC) and Non Compliance (NC) as per the criteria shown in Table 4.

**Table 4: Grading Criteria**

% age of SOP requirements met	Grading of the Activity Report
80-100%	Full Compliance(FC)
60-79%	Partial Compliance(PC)
<60%	Non Compliance (NC)

The assessment report is prepared by the designated mentors for their allocated faculty as per the format shown in Table 5.

**Table 5: Assessment Report: Active Learning Strategies**

faculty	S u b	Sec tion	Outcome of verification (FC/PC/NC/ND)				
			Flipped Class Room	TA PP S	In-Class Teams	Group Writing Assessment	Collaborative Learning

A sample Assessment Report is shown below:

Name of the faculty	Subje ct/Sec tion	Outcomes of Verification(FC/PC/NC/ND)				
		Activi ty 1	Activi ty 2	Activi ty 3	Activi ty 4	Activi ty 5
Mr. Veeranjanyulu	AVS-I					FC
Mr. G.Parthasarathy	TD				FC	
Ms. Madhavi	MOF			FC		
Mr.Ganesh	APT					FC
Ms. B. Alekhya	EDP		FC			
Mr. B. Nagaraj Goud	EDP	FC				
Mr. K. Shiva Shankar	EDP		FC			
Mr. Bhupal Rakham	FOA				FC	
Ms.Alka	EAD			FC		
Ms.K.Sree Lakshmi	FSO	FC				
Mr.MD.Khaleel	CAD/ CAM		FC			
Ms.B.Niharika	IAE			FC		
Mr.V.Vamshi	FM-II				FC	
G.Dhanajayan	MVSD			FC		
Mr.S.Sreekanth	FJR		FC			
Ms.A.Udaya deepika	ASD	FC				
Mr.B.Praveen	AP-I			FC		
Mr.A.Sai Kumar	HAD					FC
Mr.Nirmith Kumar	FJR		FC			
Mr.Raghu	CT	FC				

The Activity Learning Report along with all the enclosures is submitted by the concerned faculty to the designated mentor by 7th of every month. The mentor's carryout the assessment of the Activity Report to check their compliance in relation to the requirements specified in the SOPs. The Activity

The faculty, whose Activity Report has been graded PC/NC, are provided guidance/training by the designated mentors so that the non-compliances are not repeated in future.

## 5. Results and Discussions

We have commenced the implementation of Active Learning Strategies in the college. w.e.f July 2017. Out of 139 faculty, earmarked to implement the Active Learning Strategies, 106 faculty each have conducted one activity in the month of July 2017. The designated mentions have carried out the assessment of the Active Learning Reports submitted by the faculty. The assessment constitutes checking the compliance of the conducted activity with respect to stipulations given in the SOPs. The assessment reports have been collated for the month of July 2017 and the results are shown in Table 6.

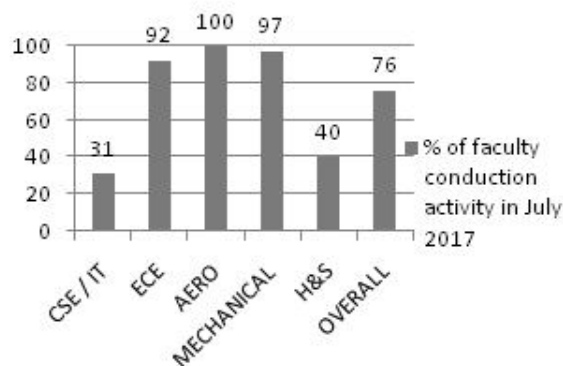
**Table 6: Results of Activity Assessment Reports**

Name of the Mentor	Dept	No. of Reports assessed	Grading			
			FC	PC	NC	ND
Mr.Prabhu Kishore, Asst.Prof	Aero	16	13	3	0	0
Mrs. Nalini Deepthi, Asst.Prof	MECH	13	12	1	0	1
Mr. MV Babu, Asst.Prof		19	19	0	0	0
Mr.DV.Suryachander, Asst.Prof	ECE	27	0	27	0	2
MR.AL Sridhara,Asst.Prof		18	2	18	0	2
Mr. Dayakar,Assoc. Prof	CSE	2	-	2	-	11
Mr.P Ram Mohan Rao,Assoc Prof.		2	1	0	1	10
Mr.Madan Reddy,Asst.Prof		7	0	0	7	4
Dr.Radhika, Assoc.Professor	H&S	2	-	-	2	2
G.Prashanthi, Asst. Prof.		0	0	0	0	1
TOTAL		106	47	49	10	33

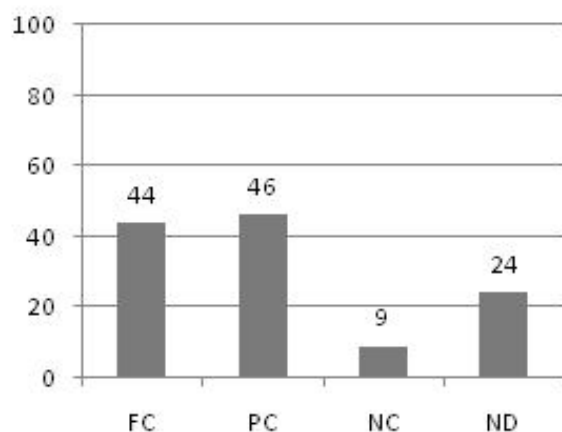
We have decided on two parameters to measure the successful implementation of Active Learning Strategies at MLR Institute of Technology Hyderabad. These two parameters are:

- o Parameter 1 : % age of faculty conducting the activity every month
- o Parameter 2: % age of Full Compliance (FC) with respect to stipulations given in the SOPs.

We have analysed the data collated Table 6 for the activity conducted in the month of July 2017. The analysis in respect of Parameter 1 and Parameter 2 is depicted in the form of graphs in Figure 2 and Figure 3 respectively.



**Fig 2: % age of faculty conducting the activity in the Month of July 2017.**



**Fig 3. % of Compliance**

We have also calculated the performance in two parameters. The results obtained are given below:

- o Parameter 1(% age of faculty conducting the Activity in the Month of July 2017) = 76%
- o Parameter 2(% age of full Compliance) = 45%

We opined that the performance in the two parameters is satisfactory since the activity has just commenced first time in the month of July 2017. However, we need to improve the performance in two parameters during the ensuing months of Academic Year 2017-18. We have targeted to achieve the performance in two parameters by the end of the academic year 2017-18 as follows:

- o Parameters 1(% age of faculty conducting activity every month)= 100%
- o Parameter 2 (% age of Full Compliance)= 90%

**Conclusion:**

The initiative to implement Active Learning Strategies at MLR Institute of Technology, Hyderabad has been taken up as one of the Best Practices to improve the Teaching-Learning Process. The aim of this best practice is shift the focus from the traditional Teacher-Centred Learning to Student-Centred Learning. We have commenced the implementation from the Academic year 2017-18 with the first Activity conducted in the month of July 2017. 76% of the faculty has conducted the activity in the month of July 2017 achieving full compliance of only 45%. The performance in two parameters will be improved in the coming months and we propose to finally achieve the target of 100% faculty conducting the Activity every month with 90% full compliance by June 2018.

**References**

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