

QC Best Practices Activity

Academic Year (2020-21)

Automobile Engineering Department

“Enhancement of Consultancy Projects to Develop Research Environment in Automobile Engineering Department”

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“Enhancement of Consultancy Projects to Develop Research Environment in Automobile Engineering Department”

1. Introduction:-

Quality circle is intended to identifying the likely causes of well and critically observed problems thoroughly. Their major benefit of this is to consider all possible causes of the problem, rather than just the ones that are more obvious. This approach combines brainstorming with use of a type of a concept map.

2. Problem Identification:

In regular meetings of quality circle group, problems identified through brainstorming sessions (with teaching and non- teaching faculties, alumni, industry persons and students) in the Automobile Engineering Department during last academic year are listed here.

Table 1. Problems identified during QC meetings

Problem No.	Problem Statements
1.	Lack of Core Company towards placement at AED
2.	Fewer consultancy projects in Automobile Engineering Department.
3.	Less number of MOUs
4.	Lack of faculty’s interaction with automotive industries.
5.	Less IRG generation
6.	Interaction of the department and training and placement office with industries
7.	Aptitude and communication skills of the Automobile Engineering students are weak.
8.	Department lacks of industry sponsored laboratory in the department.
9.	Computer literacy of some non-teaching staff is weak.
10.	5S implementation in Auto-Care
11.	Development of methodology of any one single course using PBL
12.	Enhancement of leadership, management, inter-personal skills among department students.
13.	Design and development of Central Database Management System (CDMS) for Automobile Engineering Department.
14.	Co-ordination between different portfolios (e.g. TPO, III Officer, and Alumni in-charge and department faculties) is less.
15.	Promotion of use of reference books.
16.	Lack of awareness about latest trends in automobile engineering among AED students.
17.	Less H-index publications by faculty
18.	Lack of advanced labs of automotive applications like electric hybrid drives, autonomous
19.	Lack of licensed software’s related to automobile engineering
20.	Lack of sponsored funding for student competitions’ like Baja, SUPRA, QBDC etc.

21.	Lack of research resources for student competitions' like Baja, SUPRA, QBDC etc.
22.	Lack of students interest towards subjects like Insurance, Dealership etc
23.	Lack of project management skills into students of AED.
24.	Lack of cool and ventilated infra for software labs.
25.	Inadequate space for project laboratory.
26.	Lack of well-organized structure for all laboratories.
27.	Shortfall in commercialization of patents.
28.	Lack of awareness about AED in the Multi – National Automotive Engineering Industries.
29.	Lack of email etiquettes among students and faculty members at AED.
30.	Industry sponsored projects for B. Tech students are less.
31.	Some of the students from B. Tech class are having poor attendance.
32.	Implementation of PBL to enhance course deliverables and improve understanding among students.
33.	Instruments from Automobile body engineering lab are not modernized.
34.	Average and below average merit, students are getting admitted in the AED.
35.	Lack high merit students admitted in AED
36.	More number of students are failed to achieve throughout first class.
37.	Lack of research facility to staff.
38.	Faculty overloaded with non-teaching tasks.
39.	Automated Student's Leave management.
40.	Fewer activities in department for students.
41.	Performance of Auto. Engg. Students in placement interviews is weak
42.	Poor attendance of students in classroom.
43.	Programming skills of students are weak.
44.	Less no. of students opting Minor and Honor courses
45.	Lack of industry sponsored lab
46.	Load of Multiple ISE's on students
47.	Lack of students interest towards ED and URE track
48.	Insufficient funding for motorsport activity
49.	Less interest of female students towards automobile engineering program
50.	Students ignorance towards job opportunities of service sector and insurance sector
51.	Lack of advanced automotive laboratory equipment's
52.	Intentional Groupism in students
53.	Poor self-study skills of student's.
54.	Deficiency of Individual Research Publications
55.	Less admission to the M. Tech. Automobile Program

Out of which, major governing four are formulated as:

1. Fewer consultancy projects in Automobile Engineering Department.

2. Poor self-study skills of student's.
3. Load of Multiple ISE's on students
4. Students ignorance towards job opportunities of service sector and insurance sector

3. Selection of problem:

After the substantial discussion on above major problems of the department, circulated Google form to Quality Circle team members for selecting the problem. We received high priority to the problem ***“Fewer consultancy projects in Automobile Engineering Department.”*** Screenshot of the rating to the problem selection is attached herewith.

	A	B	C	D	E	F
1	Respondant	Question [Preference 1]	Question [Preference 2]	Question [Preference 3]	Question [Preference 4]	Question [Preference 5]
2	Respondant 1	Fewer consultancy projects in Automobile Engineering Department.	Poor self-study skills of student's.	Load of Multiple ISE's on students	Insufficient funding for motorsport activity	Students ignorance towards job opportunities of service sector and insurance sector
3	Respondant 2	Fewer consultancy projects in Automobile Engineering Department.	Less IRG generation	Lack of faculty's interaction with automotive industries.	Aptitude and communication skills of the Automobile Engineering students are weak.	Computer literacy of some non teaching staff is weak.
4	Respondant 3	Fewer consultancy projects in Automobile Engineering Department.	Lack of advanced automotive laboratory equipment's	Deficiency of Individual Research Publications	Less H-index publications by faculty	Enhancement of leadership, management, inter-personal skills among department students.
5	Respondant 4	Fewer consultancy projects in Automobile Engineering Department.	Lack of industry sponsored lab	Lack of students interest towards ED and URE track	Load of Multiple ISE's on students	Load of Multiple ISE's on students
6	Respondant 5	Lack of industry sponsored lab	Load of Multiple ISE's on students	Fewer consultancy projects in Automobile Engineering Department.	Lack of students interest towards ED and URE track	Less H-index publications by faculty

Figure 1. Rating method for problem selection

4. Root Cause Analysis:-

A discussion has been made on the finding major causes and listed out as below

- a. Dedicative efforts
- b. Motivation
- c. Industry connections
- d. Inferiority complex
- e. Limited collaboration
- f. Behavior/Attitude
- g. Lack of Consultancy Culture
- h. Software up gradation
- i. Lack of precision
- j. Conventional equipment
- k. Time taking Process flow
- l. Continuous follow up needed

- m. Complicated paper work/ documentation

After discussion on above findings only four major finding we have listed out as below

- i. Dedicated efforts has not made for enhancing consultancy projects.
- ii. Limited collaboration
- iii. Software upgradation
- iv. Conventional equipments

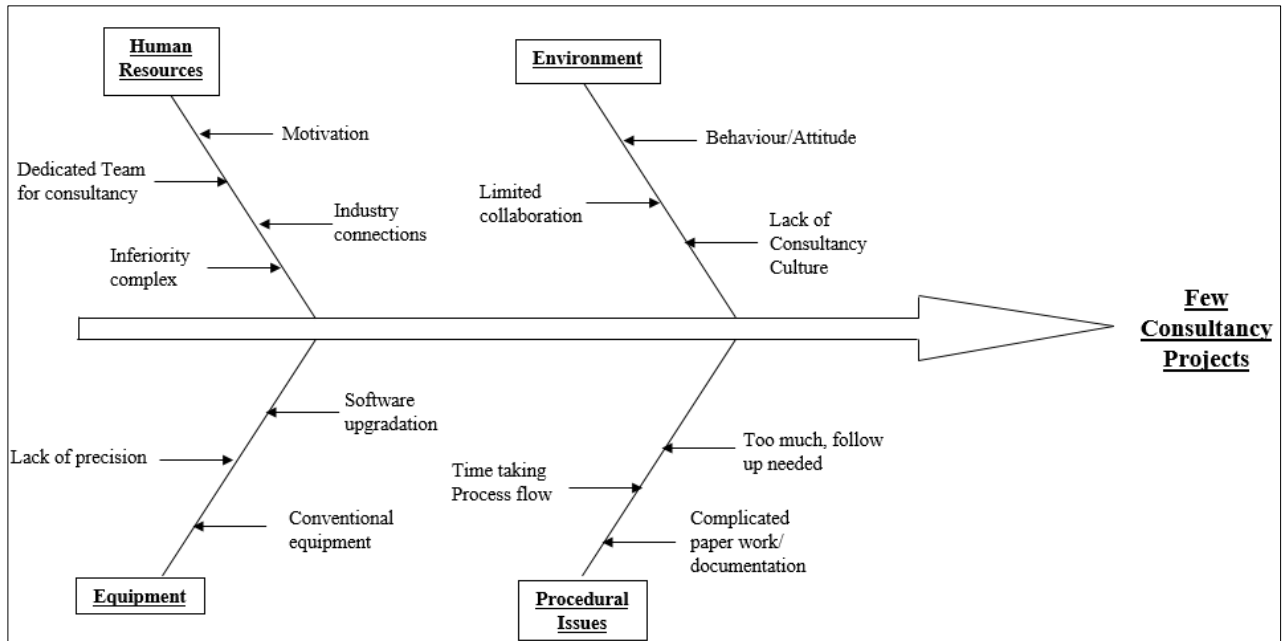


Figure 2. Root Causes Analysis

After listing causes responsible for fewer consultancy projects, we classified major cause and sub cause in fishbone diagram. We got the root cause from cause - effect analysis is **“Lack of Consultancy projects”**.

5. Proposed Solution

After fruitful brain-storming carried out on different aspects of the selected problem, the above cause-effect analysis diagram revealed that the root cause of the problem is nothing but the lack of consultancy projects. After in-depth discussion among team members, the proposed solutions for the selected problem is finalized which is as-

- I. To know consultancy status.
- II. Discuss weaknesses & scope of improvement of consultancy
- III. To motivate all faculties for improvement in consultancy
- IV. Marketing of resources available for consultancies
- V. Meeting / visits with industry people to get consultancy projects.

6. Objectives:

For implementing the proposed solution, the objectives are defined as-

1. To identify relevant areas to increase consultancy projects.
2. To find out consultancy opportunities from various industries.
3. To implement the planned activities to enhance the consultancy projects.

7. Action Plan:

Sr. No.	Action to be taken	Responsible person	Deadline	Action taken
1.	To know consultancy status.	QC Team.	10/03/2021	Collected information.
2.	Discuss weaknesses & scope of improvement for consultancy	All faculties	15/03/2020	A fruitful discussion in the meetings.
3.	To motivate all faculties for improvement in consultancy	QC Team.	25/04/2020	Discussed the benefits of consultancy improvement and motivate to plan individually.
4.	Marketing of resources available for consultancies	All faculties.	Continuously	Dissemination through various programs / workshops conducted, alumni, social media.
5.	Meeting / visits with industry people to get consultancy projects.	All faculties.	Continuously	Physical/ virtual meetings and telephonic conversations.

8. Results & Discussions:

The consultancy details of the year 2018-19, 2019-20 and 2020-21 are reported in Table No. 1, 2 and 3 respectively. Form the details it is cleared that the for the year 2018-19 the total consultancy is Rs. 12000 and for year 2019-20 it is Rs. 31000, however these includes academic

projects and workshops for the industry officials. There was lack of industry project consultancy. By looking to this problem, the quality circle group has taken efforts to improve the consultancy project in the department. Due to different efforts and activities the consultancy for year 2020-21 is resulted Rs. 1,01,800+ and few are in progress, which includes more industry projects. So, compare to last two years the consultancy revenue as well as number of projects improved significantly for year 2020-21.

Consultancy (2018-19)

Name of the faculty	Project Title	Project Type Research/ Consultancy	Funding Agency	Amount in INR	Duration
Dr. S. R. Desai	Design and Development of Automated Manual Transmission Controller	Consultancy	Annasaheb Dange College of Engineering and Technology, Ashta	7,000/-	2018-19
Dr. S. R. Patil	Study and Trial on MR Fluid using Honey	Consultancy	Sharad Inst. of Technology, Yadrav	4000/-	2018-19
Prof. P. S. Ghatage	Engine Analysis by using GT Power software	Consultancy	Mr. Pradipkumar Shelake, K.I.T. Kolhapur	1000/-	2018-19
Total				12000/-	

Consultancy (2019-20)

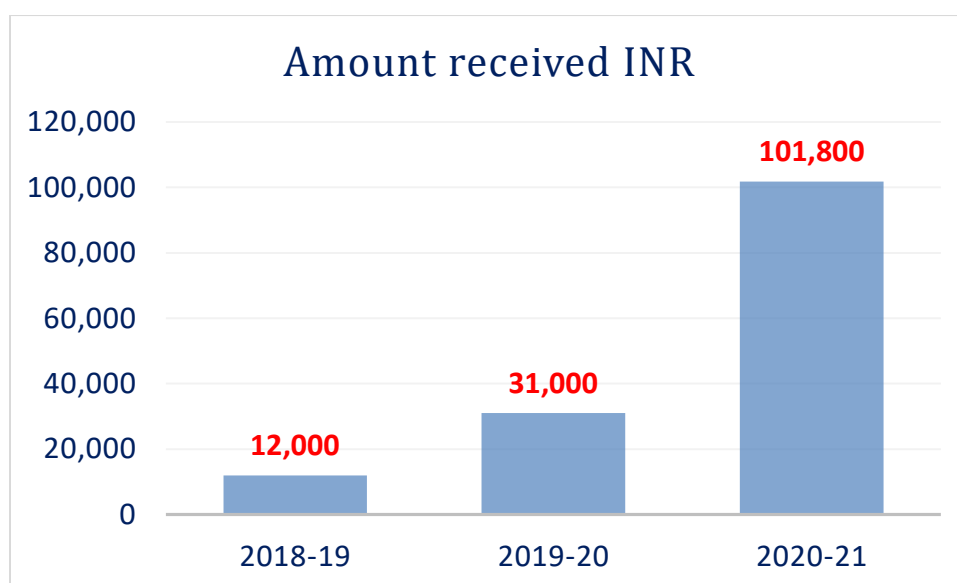
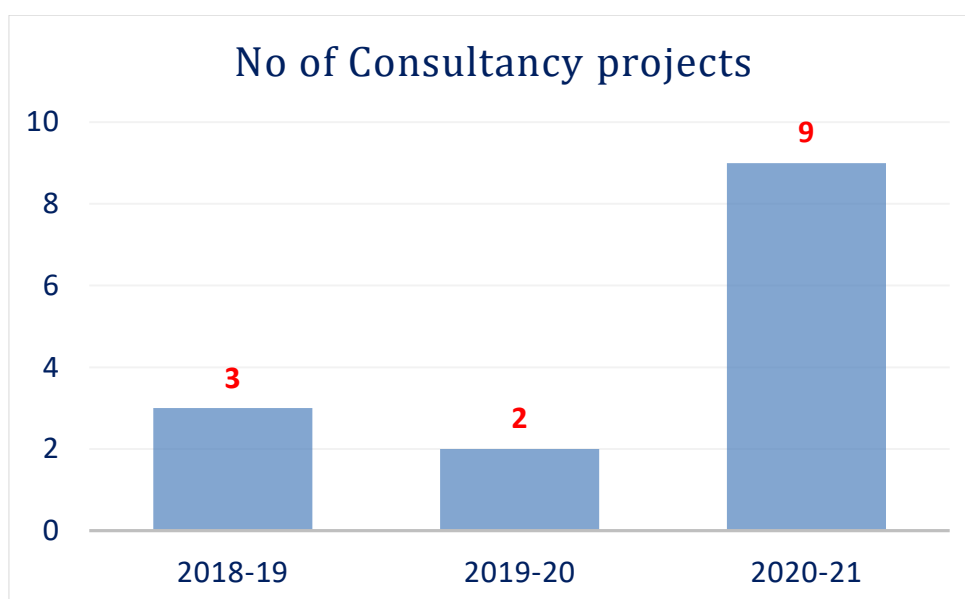
Name of the faculty	Project Title	Project Type Research/Consultancy	Funding Agency	Amount in INR	Duration
Dr. S. R. Kumbhar	One Day Workshop on Introduction to I. C. Engines	Consultancy	Employees of Saroj Foundry Pvt. Ltd., Kolhapur	15,500/-	2019-20
Prof. S. T. Satpute	One Day Workshop on Introduction to I. C. Engines	Consultancy	Employees of Saroj Foundry Pvt. Ltd., Kolhapur	15,500/-	2019-20
Total				31,000/-	

Consultancy (2020-21)

Name of the faculty	Project Title	Project Type Research/ Consultancy	Funding Agency	Amount in INR	Duration	Remark
Dr. S. R. Desai	Design and development of experimental setup and fluid elastic vibration testing of heat exchanger tube arrays subjected to water cross flow Status	Consultancy	Samarth Engineers, Hatkanangale	75,000/-	2020-21	Completed
Dr. L. M. Jugulkar	Shock Absorber Testing Using Shock Absorber Test Rig	Consultancy	FCRIT, Vashi, Mumbai	10,900/-	2020-21	Completed
Prof. Y. S. Patil	Shock Absorber Testing Using Shock Absorber Test Rig	Consultancy	FCRIT, Vashi, Mumbai	10,900/-	2020-21	Completed
Prof. S. S. Mane & team	Beading Machine for Metallic Gas Pipe	Consultancy	Grandiose Automation Solutions Pvt Ltd., Pune	Yet to be decided	2020-21	In-Progress
Prof. S. S. Mane & team	Plastic Forming Machine	Consultancy	Grandiose Automation Solutions Pvt Ltd., Pune	Yet to be decided	2020-21	In-Progress
Prof. S. S. Mane & team	Automatic Cooking Machine	Consultancy	Grandiose Automation Solutions Pvt Ltd., Pune	Yet to be decided	2020-21	In-Progress
Prof. P. S. Patil	Development of advanced setup for qualitative testing of organic agro nutritional products	Consultancy	ROSMERTA AGRO INDIA PRIVATE LIMITED	Yet to be decided	2020-21	In-Progress
Dr. S. D. Yadav & Prof. S. S. Mane	Scientific investigation of early detection of corrosion in a vehicle body.	Consultancy	{Mahindra & Mahindra, Bolero Power+ ZLX (MH 10 CX 2400)}	5,000/-	2020-21	Completed

			Vehicle Owner			
Dr. S. D. Yadav & Prof. S. S. Kumbhar (Civil Dept.)	Utilization of sugar cane waste.	Consultancy	Kumbhar Sugarcane Seedling, Kagal	Yet to be decided	2020-21	In-Progress
				Total	1,01,800/-	

Comparison of last three years consultancy:



8. Outcomes:

After carrying out the above activities following outcomes are obtained

- 1) Acquainted experience to solve real life problems
- 2) Significant increase in the number of consultancy projects.

9. Conclusion:

Due to effective implementation of QC methodology, the problem of fewer consultancy project is analyzed systematically and enhanced consultancy opportunities for the current year. The faculties of department got the exposure to industry problems. Faculties are able to utilize their expertise to solve the technical problems raised by industry and society. It enhanced the problem solving ability of faculties. In addition, the revenue from the existing research facilities is increased due to the increased number of consultancy projects.

10. Future Scope:

The consultancy in Automobile Engineering Department is improved significantly for the year 2020-21 compared to previous two years.

The following actions can improve consultancy further in the department.

1. Efforts to increase active MOUs with reputed industries
2. A scope to enhance the research facilities.
3. Involvement of the student groups in consultancy project.
4. Increase in consultancy with different industries can increase in the internship opportunities for the students.

Activity Chart:

Sr. No	Activity	P	D	Feb 2021		March 2021				April 2021				May 2021				June 2021						
		A	C	3 rd Week	4 th Week	1 nd Week	2 nd Week	3 rd Week	4 th Week	1 nd Week	2 nd Week	3 rd Week	4 th week	1 nd Week	2 nd Week	3 rd Week	4 th week	1 nd Week	2 nd Week	3 rd Week	4 th week			
1	Identification of work related Problem	Plan		Shaded																				
2	Selection of Problem						Shaded																	
3	Define the Problem	DO					Shaded																	
4	Analysis the problem							Shaded																
5	Identification of causes									Shaded														
6	Finding out the root cause										Shaded													
7	Data Analysis	Check								Shaded														
8	Proposed Solution											Shaded												
9	Implementation	Act										Shaded												
10	Follow up and review													Shaded										
11	Report preparation & Presentation																				Shaded			

