

# *Strategic Planning to Promote Engineering Projects in Community Service (EPICS) in Engineering Institutions*

Dr. S. Sudhakara Reddy, Dr. N. Rajeswaran, Kesava Vamsi Krishna V.  
Malla Reddy Engineering College (Autonomous), Hyderabad, Telangana, India  
edc@mrec.ac.in

**Abstract:** One of the Programme Outcomes prescribed by the National Board of Accreditation, the Apex body for accrediting the Engineering Colleges in India is 'Engineers and Society'. Therefore an Engineering institution, with a vision of providing means for the all round development of the student needs to give appropriate priority to this outcome as well. Our institute adopted a two phase strategy to achieve this outcome.

At the freshman stage, students were involved in a programme called 'National Service Scheme' (NSS), promoted by the government and affiliating university. The students took up various activities like sensitizing the local villagers about cleanliness, vaccination to the kids, oral care and other important issues. Also they conducted a comprehensive survey in identifying the societal problems like water clogging, drainage issues etc.

When the students acquired certain engineering skills like designing, programming, product development etc in their further course of study, they started working on the identified societal problems and solve those problems with their engineering knowledge. This forms the second phase, called 'Engineering Projects In Community Service' (EPICS) and is adopted from Purdue University, USA.

In this paper, we would like to present the implementation of this two phase strategy in our institution

**Key words:** Programme outcome, NSS, Project, EPICS

## **I. Introduction**

National Board of Accreditation (NBA), the apex body for accrediting the Engineering Colleges in India prescribes twelve Programme Outcomes in tune with the Graduate attributes prescribed by Washington Accord [1]. Any engineering college that follows these Programme outcomes have to ensure that their curriculum addresses all of these 12 outcomes. One among these twelve Programme Outcomes is 'The Engineer and Society'. This outcome has been included, keeping in mind the crucial role to be played by an Engineer in the prosperity of the society. Our institute adopted a two phase strategy in achieving this Programme outcome.

## **II. PHASE I:**

There is a widespread word called NSS in the academic lines. National Service Scheme (NSS) programme was launched in 37 Universities in the year 1969 [2]. The main objective of this programme is to give the students the sense of involvement in the tasks of national development. As a part of the two phase strategy adopted by our institute, the freshman students were motivated to enroll themselves in NSS. The enrolled students went on field trips and visited the nearby villages, interacted with the local villagers [Fig 1]. Students got a good chance of observing the problems faced by the villagers. Poverty, lack of awareness, lack of education were few of the factors identified for various problems faced by the villagers. Accordingly the following few activities were planned as a part of NSS field trip:



**Fig 1: NSS volunteers interacting with the local villagers.**

### **Sensitizing the local villagers about cleanliness**

This happens to be a major issue of concern as unclean and untidy surroundings lead to many of the diseases. With the financial restrictions on the local panchayat, good drainage facilities cannot be observed in the villages. Therefore the students during their field trips tried to sensitize and educate the villagers about keeping the surrounding environments cleaner, making them free from water clogging etc. Simple measures that keep the ambience beautiful and healthy were

taught to the local villagers [Fig 2]. Awareness on Government promoting schemes like 'Swachh bharaoh' was created among the local villagers.



**Fig 2: Solid Waste management facility in the adopted village**

#### **Vaccination to kids:**

Prevention is always better than cure. Therefore the local villagers were educated during the field trips about the importance of vaccinating the kids to save their lives from harmful diseases.



**Fig 3: Doctors educating the villagers about oral care.**

#### **Oral care:**

The life style and the improper habits of the villagers bring them lot of oral related issues. Special camps were organized in association with the local hospitals to educate the villagers about oral care and the measures that they need to take to keep themselves off from the oral related issues were taught [Fig 3].

These are the few of the many problems faced by the local villagers. The variety of experiences gained by the students during their field trips gave a comprehensive

idea about the problems and the reasons behind those problems.

### **III. PHASE II:**

In the due course as the students progressed academically, they acquired the skills of programming, designing, product development etc. At this stage, they needed an orientation, to channel their skills in solving the identified problems. Here came a wonderful tool in the form of IUCEE SCALE (Student Consortium for Advancement and Learning in Engineering education). About 150 students participated in this SCALE workshop which involved debates, brain storming sessions and many more. The interesting part about this workshop is that it is a kind of workshop for the students and by the students as well i.e., the resource persons for this workshop were students again. The SCALE workshop was conducted with the theme 'Transformative youth and Engineering Education'.

### **IV. Methodology:**

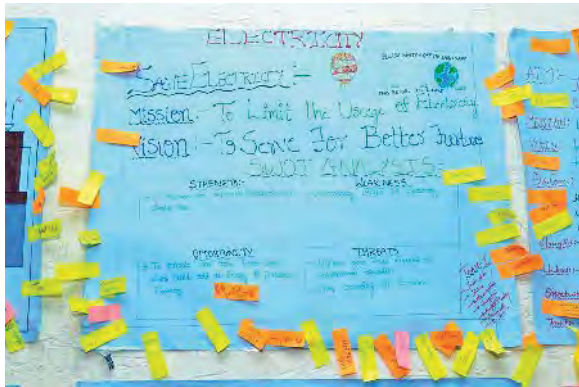
The workshop was conducted in three days. The participants were heterogeneous belonging to different branches of engineering. On day 1, a group discussion was conducted among the inter disciplinary students which helped in identifying various tracks [3]. The following tracks were selected out of all the tracks that surfaced during the group discussion. They are:

Track 1: Climate change and Affordable clean energy

Track 2: Rural infrastructure

Track 3: Responsible consumption and production

on day 2, the resource persons, called facilitators grouped the participants into different tracks and each track was monitored by individual facilitator according to their specialization. The students were given brief introduction on the chosen track and they were given time to reflect and come out with a relevant idea. Then the students were asked to brainstorm for design thinking. This was followed by poster presentation for the proposed design thinking [4]. Then the presented poster was visited by the fellow participants and evaluated by the facilitators. This exercise helped the students to learn from each other and to get motivated by each other. Few of the posters presented by the students are depicted below [Fig 4a, b, c, d].



On the final day the participants were asked to give a power point presentation based on the idea portrayed in their poster. After a thorough discussion with the peers, the final and improved version was presented depicting the action plan for the implementation of the proposed project [5]. Thus the project identified, analyzed and designed in a systematic manner could solve a societal issue, benefitting the community at large, conforming to the very philosophy of Engineering Projects In Community Service (EPICS) advocated by Purdue University.

The following table gives few of the ideas generated during the SCALE workshop.

S.No.	Name of the idea
1	Climate control by dump yard
2	Solar powered handloom
3	Carbon di oxide capture and storage
4	Solution for wastage of food
5	Renewable resources
6	Prevention of drying bore wells
7	Waste management
8	Limiting the usage of electricity

### V. Conclusion

Undoubtedly, EPICS is the need of the hour to address the Programme outcome - 'Engineer and the society'. The two phase strategy proposed in this paper and implemented in our institute seems to be a promising strategy for effective attainment of the said Programme outcome.

### VI. References

1. <http://www.nbaind.org/files/PEOs-Curriculum-and-CO-PO-mapping-21-may-2016.pdf>
2. <https://nss.gov.in/about-us-0>
3. Felder R, Stice J, Rugarcia A. The future of engineering education: making reform happen. Chem Eng Educ. 2000;34(3):208.
4. Kleinsmann, M., Valkenburg, R., & Sluijs, J. (2017). Capturing the value of design thinking in different innovation practices. International Journal of Design, 11(2), 25-40.
5. D. Sumathi, S. Kannan, S. Sudhakara Reddy, "Transformation from Millennial Students to Engineers in Engineering Institutions-A Case Study", Int., journal of JEET. Vol:34,pp-84

Fig 4 a,b,c,d: Posters presented at SCALE workshop

## Authors:



**Dr. S. Sudhakara Reddy** received his B.Tech in Mechanical Engineering from Kakatiya University, Warangal and M.Tech. in Design and Production from NIT-Warangal. He completed Ph.D from Sri Venkateswara University, Tirupathi. His research work was carried out at DMRL and ARCI at Hyderabad. His area of research includes Tribology, CAD/CAM and Advanced Manufacturing Technology. He has more than 30 years of rich experience in both teaching and industry. He published more than 20 technical papers in national and international conferences and journals. He has also published articles and book chapters covering a considerable range of dreaming topics in the field of mechanical engineering. He is the Life member of ISTE, SAHTSE, FIE, IPE, ISME and GEDC. He got two Lifetime Achievement Awards in best Administrative category and Engineering. He was conferred upon by Bharath Siksha Ratan award by GSHEG, New Delhi in the month of April 2018.

**Dr. N. Rajeswaran** is presently working as Professor in Electrical and Electronics Engineering at Malla Reddy Engineering College (Autonomous), Hyderabad. He did his Bachelors in Electrical and Electronics Engineering in Government College of Engineering., Bargur (Madras University) and also obtained Masters Degree in Applied Electronics from Anna University Chennai, Tamilnadu. He completed doctoral degree from Jawaharlal Nehru Technological University Hyderabad, Telangana, India. He has published more than 35 research papers in various International journals and conferences. His area of research interest includes Electrical Machines, Soft Computing and VLSI Design. He is a life time member of various professional bodies like ISTE, IAENG and IACSIT.



Kesava Vamsi Krishna V., is a post graduate in Physics from the prestigious Sri Venkateswara University, Tirupati. He pursued his M. Phil. in Physics from the same University. He registered for Ph. D. in Rayalaseema University, Kurnool. He works as Associate Professor in Physics, Malla Reddy Engineering College (Autonomous), Secunderabad, Telangana, India. He published two editions of lab manual for Engineering Physics laboratory. Besides teaching, he is Media relations co ordinator at MREC(A). He attended numerous FDPs, workshops, QIPs, national and international conferences. His areas of research interest include thin films, nano materials, teaching and learning methodologies etc. He is life member in APSMS.