VARDHAMAN COLLEGE OF ENGINEERING, HYDERABAD
## Autonomous institute affiliated to JNTUH

<u>Best Practice - 1</u>

Title of the Practice: Inculcating social responsibility in students through innovative projects such as Social Innovation and Engineering Exploration

Objectives: To build social responsibility in students through innovative and useful projects through Engineering Knowledge. IEEE and EPICS with Purdue University, USA have helped the students a lot in improving responsibility towards social requirements.

Social Innovation brought students closer to the society and helped them to understand the problems in it. It also made the students to think about some viable solutions to the problems of the society. Engineering Exploration exposed the students to technology and made them understand and follow a Human Centered Design (HCD).

The main objective of both the courses is to create innovative services/approaches to existing social problems by using basic engineering knowledge.
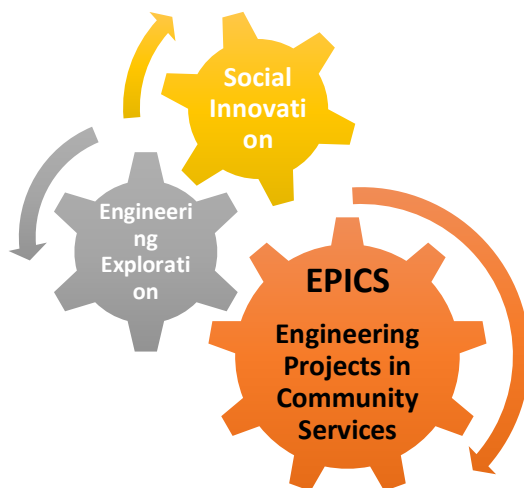
The Context:

Social Innovation is an open ended course to develop social connectedness in engineering students through social awareness and social consciousness. This can be done through live field exposure along with faculty led conceptual presentations, real case reviews, self-study assignments, literature and field survey. Through this course, the students are expected to use their engineering knowledge to provide innovative solutions to existing social problems. This course also develops critical thinking ability among the students.

This course starts with differentiating science and engineering, scientist and engineer, followed by describing engineering graduate attributes and what engineers "do".

Engineering Exploration course offers the fundamental principles, concepts of engineering, as well as the influences of engineering on society and also hands-on and experiential learning opportunities in specific areas of engineering.

This course focuses on data collection and analysis, engineering problem-solving, mathematical modeling, contemporary tools (software and hardware), professional practice and expectations (e.g. communication, teamwork, ethics) and the diversity of fields and majors within engineering.

The topics covered in this course include engineering design process in multidisciplinary domain, unique platform to showcase any idea into functional prototype, project management skills, exploring engineering skills with ethical and sustainability perspective.

The Practice:

For design of curriculum and practical implementation of the two courses, we have consulted expertise people such as Mr. Rajeev from, KLE Technological University, Hubilli, a group of professionals from Surge Impact and Professor Dr. William Oakes, Director of EPICS, Purdue University USA.


Faculty Interaction with Surge Impact Foundation regarding Social Innovation Course
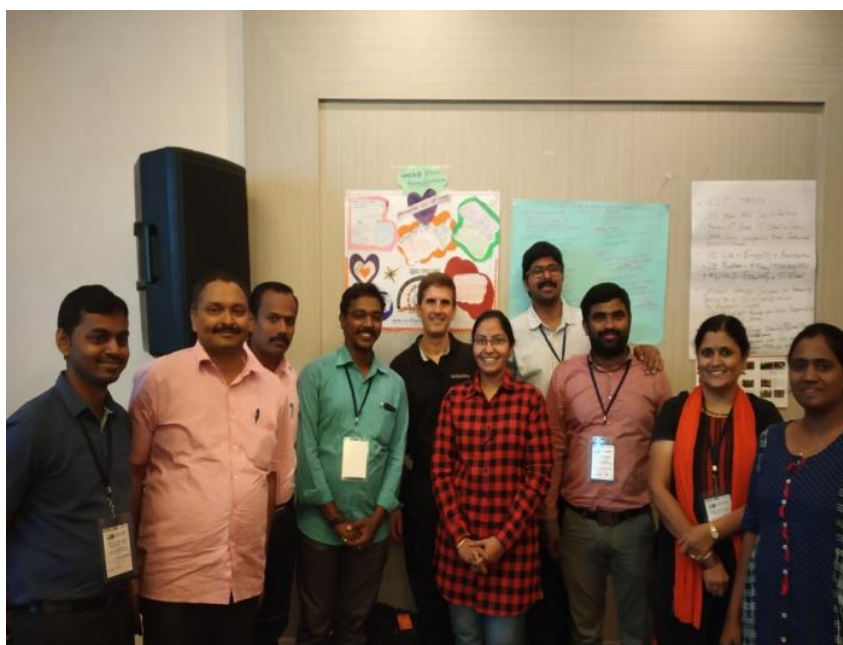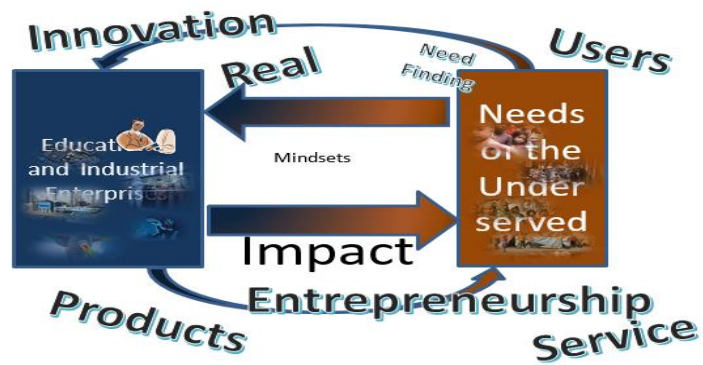

Visit of Dr. William Oakes to VCEH to Evaluate Engineering Exploration Projects

During the implementation of the course there were many Innovative teaching learning processes were used.
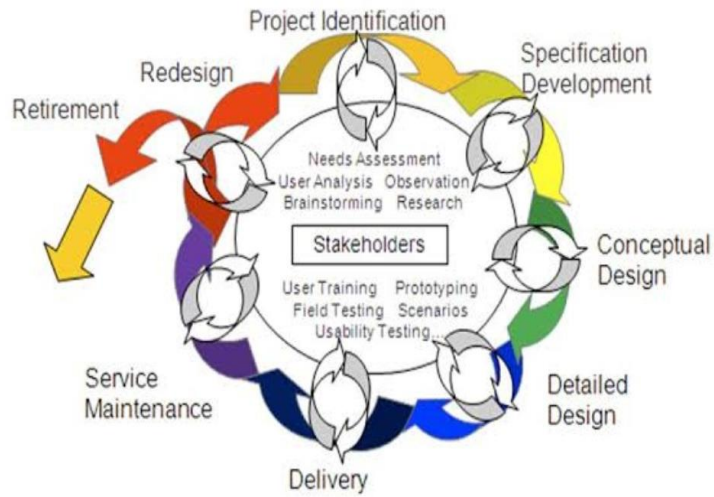
The best practices were team building activity, Chart activity, presentations of the problems and the solutions given etc.,
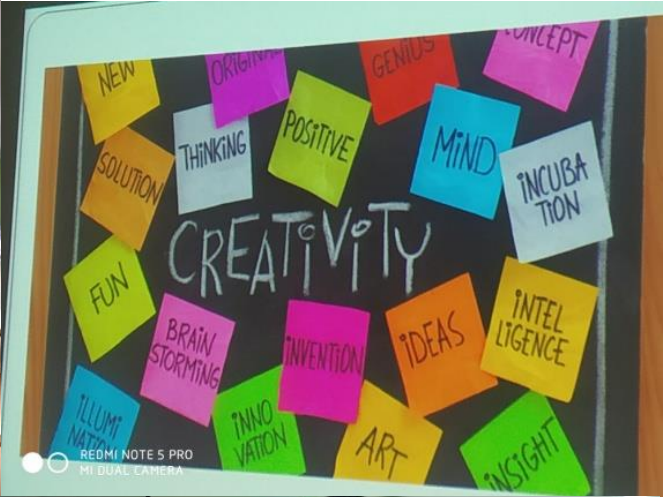
Social Innovation Presentation by Students

Understanding Need of society and about the Innovative solution

Human Centered Design was learnt by the students and applied for the solution

Evidence of success:

Impact of Engineering Explorations
- Introduction to Engineering and Engineering Study
- Various disciplines of engineering
- Engineering Design Process
- Introduction to mechatronics system
- Introduction to various platform based development
- Engineering Ethics
- Identifying Ethical Dilemmas
- Sustainability
- Project Management and Tools

Impact of Social Innovation:
- Introduction to Social Innovation
- Distinguish between simple, complicated and complex problems
- Critical Thinking for Social Innovation
- Models for Creative Thinking
- Process of Social Innovation
- Prototyping
- Sustaining
- Scaling and diffusion
- Social Innovation across Four Sectors
- Stages of Innovation

Few sample project submitted by first year students as a part Engineering Exploration
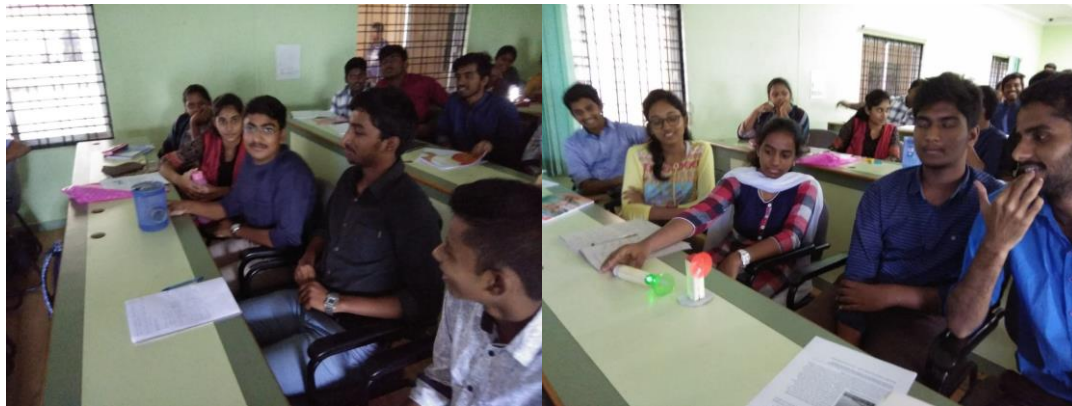
Portable Air Cooler designed   **A mini torch and fan designed from scrap**

Best Practice – 2

1. Title of the Best Practice:

Initiative towards developing entrepreneurship through Centre for Innovation and Entrepreneurship (CIE)

2. Goal

Center for innovation and entrepreneurship (CIE) is dedicated to promote and support the spirit of entrepreneurship among the graduated and graduating students of Vardhaman.

3. Objectives

- To act as an institutional mechanism for providing various services including information to budding student entrepreneurs.

- To foster better linkages between the Institution, Industries and R&D institutions in the region and other related organizations engaged in promoting Small & Medium Enterprises (SMEs) including NGOs and other Voluntary Organizations.

- To catalyze and promote development of technology Enterprises and promote employment opportunities.

- To respond effectively to the emerging challenges and opportunities both at national and international level relating to SMEs and Micro Enterprises.

4. The Context

CIE, **VARDHAMAN COLLEGE OF ENGINEERING** wishes to facilitate the creation of ideas and inventions that benefit society. To this end, **CIE**, **VARDHAMAN COLLEGE OF ENGINEERING** has established an Incubation centre and adopted this Incubation Policy to provide guidance and management structure to facilitate the development of entrepreneurship.

Incubation centre at Vardhaman College of engineering is registered as separate LLP Firm with name "VEC Experimental hub Pvt Ltd" and all the incubated firms are registered under VEC Experimental hub pvt ltd.

VEC Experimental hub Pvt Ltd**, under the aegis of CIE Vardhaman** and supported by Vardhaman College of Engineering that funds, mentors and nurtures ideas, startups and entrepreneurs. Virtual incubates can operate from anywhere in India. Incubation center supports:

- Early stage startups
- Mid to large sized companies with developed ideas
- Mentors to help our startups

We have defined our own Incubation policy and IPR policy. The below mentioned procedures for the operational matters are covered under incubation policy. However The **policy** is subject to periodical review and amendments. It will be the responsibility of the companies admitted to **CIE** to update themselves from time to time on amendments in the Incubation policy and procedures.

1. Eligibility
2. Admission procedure
3. Infrastructure and Services provided to incubate
4. Mandatory Mentorship
5. Period of Incubation/ Exit
6. Intellectual Property Evaluation
7. Seed Funding
8. Periodic Assessment
9. Conflicts of interest
10. Disclaimer
11. Agreements

Vardhaman College of Engineering reserves the rights to make an exception of all or any of the terms of the policy for a particular company or a promoter on a case to case basis

Vardhaman College of Engineering has applied for funding support from the following institutions
NitiAyog - Atal incubation centre
EDII - Entrepreneurship Awareness camps
MSME – Incubation Centre
AICTE – Sammridhi Scheme

5. Practice

Entrepreneurs face many challenges in today's ultra-competitive business world; fortunately, contemporary times have also blessed entrepreneurs with more resources for tackling those problems than ever before.

Diversification: Entrepreneurship education teaches students to recognize and seize diverse opportunities for financial gain. This allows people to work in authentic environments that best suit them. As a result there is greater individual satisfaction as compared to conventionally employed workers. Market diversification increases a consumer's options and allows for more dynamic competition.

Creation of Employment: Unemployment is a rampant problem in many societies. Entrepreneurship education aims at empowering people to create employment opportunities. The aim of this training is to enable these people to start the small and medium enterprises important in any country's growth. This sector accounts for half the private workforce in India. Most people seeking employment depend on entrepreneurs to embark on new ventures and hire them.

Individual Competence: Entrepreneurship education imparts qualities such as self motivation and financial responsibility. In addition this education empowers people to have self discipline since entrepreneurship involves taking well calculated risks. People who have gone through this kind of training are able to recognize opportunities. Entrepreneurship education also encourages innovation in the running of organizations.

People Empowerment: Teaching people innovative ways to make a living enables them to take control of their circumstances. In Tanzania, for example, entrepreneurship education is being used as a tool to empower women. Technically trained women, for example, struggle to find
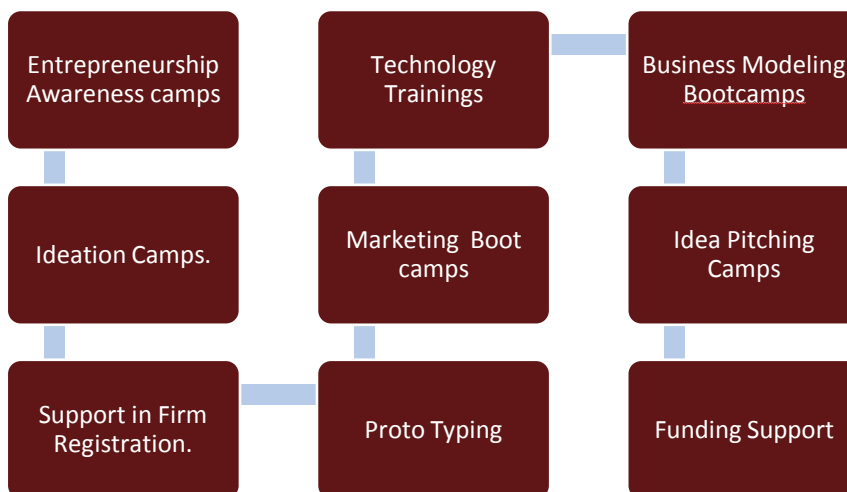
employment in a male dominated domain. The education is aimed at improving their self confidence and giving them a chance at becoming self reliant so that they are not totally dependent on employment. This form of education also builds up self-awareness. It provides a dynamic platform on which an individual can explore his strengths through practical application and not theoretical knowledge gained from basic education.

Entrepreneurship Activities on campus.

Various Activities are organized regularly to encourage and support students and faculty members. Frequency of the activities will be weekly, monthly and annually.

1. Entrepreneurship Talk series
2. Entrepreneurship Awareness camps
3. Ideation camp
4. Business Development Bootcamps
5. Visit to startups
6. Faculty development workshops:
7. Establishment of Entrepreneurship development cell:
8. E-Summit:

Incubation meetings

Entrepreneurship Awareness camps	Technology Trainings	Business Modeling Bootcamps
Ideation Camps.	Marketing Boot camps	Idea Pitching Camps
Support in Firm Registration.	Proto Typing	Funding Support

Flow of Activities at CIE-Vardhaman

Startups on campus

S No	Startup Name	Sector	Student name	Designation
1.	Acads360 India	Software	Nitish Reddy	Founder and CEO
2.	Cybereye	Software	RamGanesh	Founder and CEO
3.	Aakriti	Marketing	Mr.Geethardha Talasila	Founder and CEO
4.	Fatkat	E-Commerce	Mr.Vasu	Founder and CEO
5.	UtorAI	SAAS	Mr.Burhan Shaikh	Founder and CEO
6.	Grad	Learning management System	Mr.Ravi Teja	Founder and CEO
7.	Strada Technologies	E-Commerce	Mr.Vuppula Harshith	Founder and CEO

Awards by Startups on campus

| S. No	Name of Startup	Award	Year
1	UtorAI	TiE GRAD Business Idea Tournament Grand Finale 1,00,000/- cash prixe for Best Presentation Skills	2018-19
2	UtorAI	TiE GRAD Business Idea Tournament Grand Finale 1,00,000/- cash prixe for Best One Minute Pitching	2018-19
3	Fatkat	Reached finals of TiE GRAD Business Idea Tournament Grand Finale	2018-19

Brief Description of startups Incubated at CIE Vardhaman:

Utor AI:

Utor AI is a platform which helps Small & Medium Enterprises, Startups, Businesses and firms build enterprise grade chatbots which are robust and intelligent at cost effective prices which can easily be afforded.

When we say enterprise grade chatbots we mean it, our platform offers the most essential features required for businesses like deep actionable insights, performance management, maximum conversational accuracy, engine which trains and allows bots to learn from every single conversation and also industry standard encryption to meet the organization's standards.

Our platform is capable to deploy bots on Facebook Messenger, Websites, Web and mobile Apps, Google Assistant and various other channels. It also connects the chatbot to organization's email and help desk.
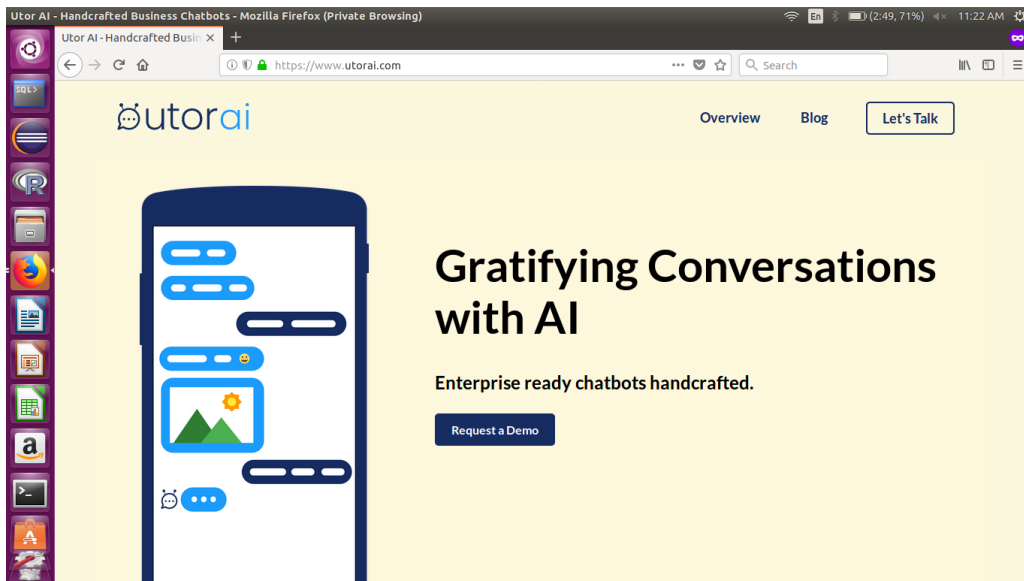
Our chatbots are fully tested and are deployed through a very sophisticated development pipeline that includes maintaining, improving and testing chatbots.

The heart of Utor AI is its powerful AI Engine which has been developed using Industrial Strength Natural Language Understanding and proprietary algorithms. Made up of a number of different Machine Learning libraries, the NLU engine does the work of identifying and extracting entities, which are relevant pieces of information provided by the user.

Grad

Grad provides a student platform to enhance skills, earn money and gain experience with projects. We provide Digital Library for institutions and individuals at a minimal cost with a variety of books. We provide project experience for students with corporates across India. We provide Learning Management System for Schools and Institutions so that there will be interaction between students and teachers outside the classroom.
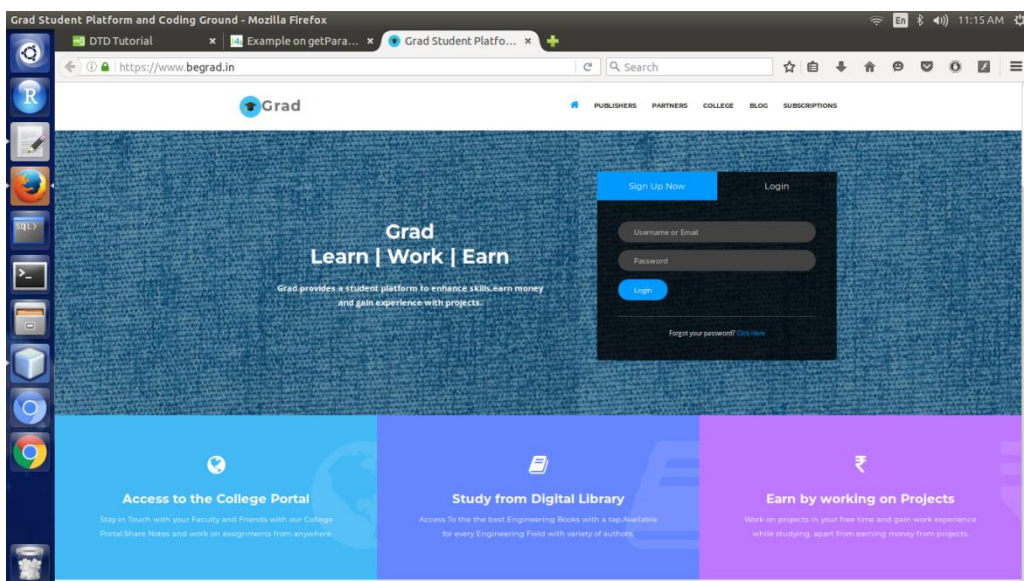
E-Summit:

E- Summit 2018 is organized on 21st and 22nd at vardhaman College of Engineering. It is the juncture where notorious tech giants, speakers, entrepreneurs and the entire startup ecosystem of India will congregate. Work from home, order food from home, order cosmetics, cloths, cab, vegetable, computers is so convenient and easy in today's date. What's common in all of them? The answer is simple; it is Entrepreneurship.

In order to further make our life comfortable and peruse our dreams of being an Entrepreneur, Vardhaman College of Engineering has organized the E-Summit Hyderabad 2018. The two days events on the 21st and 22nd of August has begun in the college, where thousands of Engineering students from across India have participated. To further fuel their interest in Entrepreneurship, the experts from various fields have come to the college and share their experience, clear the doubts and highlight the importance of Entrepreneurship in India and across the world.

How can one go empty hand after attending the E-Summit at Vardhaman College of Engineering, here we go with what E-Summit 2018 Hyderabad has to offer on 21st August:

The Eminent speakers have delivered the lectures on varigated topics, and made the concept clearer. E-Summit, includes Aakash Masand (CEO of Nucleus Tech), Santosh Nair (Entrepreneurship Coach and Motivational guru), A.P Reddy (Popcorn Apps), Geeta Goti (NSIC Independent Director), Rajesh Sehgal (Founder, Equanimity Investments) Srinivas Madhavam (Founder and CEO of Vdeliver), Prashant Lingam (CEO, Bamboo House) and Abdul Mujeeb (Founder and CEO, ALIKA). Apart from these Entrepreneurs, we had eminent figures such as Vaishnavi Gaddam (Managing Director V6 News), Jayesh Ranjan (IIT Secretary Govt. of Telengana) and Antriksh Bajaj (CEO the Aura Group).

The fulfilling first day, attracted more students on the second day, where the eminent speakers will deliver the lecture and shared their concepts on unique topics related to technology. The Speakers who came are Shanta Thoutam (Director- Innovation Cluster, T-Hub), Jyothi Reddy (CEO, Keys Software Solution), Tara Varghese (HR Manager- Invesco), Sandeep Mudalkar (CEO& Founder, Sytech Labs), Amit Singal (Co-Founder and CEO, Startup Buddy), Vikrant Varshney (Cofounder & Managing Partner, SucSEED Angel Network), Harshad Lahoti(Founder & CEO, Ah! Ventures), Kadiyam Srihari (Deputy CM, Govt of Telengana), Malla Reddy (Member of Parliament) Yashwant Reddy (M.D Nucleus Tech) and Dr. Sai Satyanarayan Reddy (Principal of Vardhaman College of Engineering).

Participants of E-Summit

6. Problems Encountered and Resources Required

Entrepreneurship support has its limits. It prepares students for future intrapreneurial and entrepreneurial careers and promotes the commercialization of research results. Close co-operation and integration of College internal and external support infrastructure and services is an important success factor. Getting in private actors contributing to College entrepreneurship support as early as possible is crucial in exposing would-be-entrepreneurs and support providers to the "world of business".

Best Practice – 3

1. Title of the Best Practice:

Student Skill development training to prepare students industry ready

2. Objectives:

The main objectives of the Skill Development Training program is ensure that our graduates have employable skills and can contribute towards the development of the nation. Over the period of 4 years, we train our students based on the requirement of the global market. Some of the objectives are listed below:

a) Providing opportunities for life-long learning for skill development

b) Ensuring quality and relevance of training

c) Preparing the youth of India as a manpower resource for World Markets

d) Diversifying Skills development programmes to meet the changing requirements, particularly of emerging knowledge economy

e) Preparing the youth of India as a manpower resource for World Markets

f) Building true market place competencies rather than mere qualifications

Having listed the above objectives, we have ensured that our students acquire the required amount of theoretical and practical knowledge in the class rooms and labs. This helps them to understand the exiting knowledge in the field and the kind of innovations.

3. The context

Our country presently faces a dual challenge of dearth of highly trained workforce as well as non employability of large sections of traditionally educated youth who acquire little or no job skills. The challenge pertains not only to a huge quantitative expansion of facilities of skill training but also to equally important task of raising their quality.

a) **The Collaboration between Industry and Institutes**: Involvement of Industry and employers in the Skill Training structures is almost nothing. They could not be brought forward to proactively participate in the field of curriculum development, training of instructors for skill development because this would entail larger autonomy to institutions.

b) **Disparity in the kinds of jobs and youths aspiration:** In the present scenario, it is very difficult to find students to fill the classrooms and getting them to accept new kind of jobs. There is a huge gap between their aspirations and available jobs.

c) **Lack of Interest in vocational training among the students:** A large number of students with vocational education need to look for placement in private organizations or for self employment. The condition of private industrial employments and self employment are inferior in India in comparison to other countries.

4. The Practice

The Institute has established the separate department Skill Development Centre that focuses on the industry related trainings. The institute hires the skilled trainers who have lots of experience and highly qualified. The department consists of various trainers specialized in various fields and it is related to the requirements of the job market. The department was established so that our students would not face any problem in the interview and clear all the rounds without any difficulty. Keeping that in mind we have hired trainers for a) Aptitude knowledge, b) Quantative theory, c) Soft Skill and d) Technical Skill.

These trainers offer courses for the 2nd and 3rd year students for the semester and the syllabus is designed based on the requirements of the job markets. Apart from the regular classes, we also provide the industry related training for 15 days or week based on the student's requirements.

5. Evidence of success

The placement rate of the institute is increasing every year. The fact that majority of our graduates are getting jobs in the various companies itself shows the success of the department. Most of our students before they graduate, get job offers of the companies like, Cape Gemine, Tata Consultancy Services, Amazon, Salesforce, Wipro and several other.

a) **Offer from companies before graduation:** Most of our students get their job offers before they graduate. The specific trainings are offered in the third year so that it becomes easy for them to clear the interview.

b) **Company internship in the fourth year:** There are several students who opt for the internship, however, the students don't have the clear idea of how to get the internship and the various assessment process. Hence, the department helps them to go through the process and help them to clear the interview.

c) **MS or M.Tech Scholarships:** Some of our graduates prefer going for the higher studies in the foreign universities, however, they cannot afford to go without the scholarship. Hence they need to appear for various test like GRE, TOFEL, PTE, IELTS, TOFEL etc, the trainers help them to successfully clear the test through the personal guidance. #

6. Problems encountered and Resources required

The Skill Development Training program is the recent approach of the institute and it's not popular among the students. At the same time they are not aware of the functions and the objectives of the course, hence the message needs to disseminated through different platforms and inform about the existing of the department. The institute needs to hire the skilled people who can find the middle ground between the class room teaching and vocation learning. The proper collaboration of the industry and institute is very much important for the successful functioning of the department.

a) **Quality and relevance:** Quality and relevance of skill development are key to India's global competitiveness as well as improving an individual's access to decent employment. For enterprises to compete in the global economy, the quality of training must reach internationally comparable standards and be relevant to the needs of national and international markets.

b) **Shortage of Trainers:** There is an urgent need for improving the quality and size of trainer resource. Skill upgradation of trainers, their quality assurance, and improvement of their status in society are important to improve quality of training.

Best Practice – 4

1. Title of the Practice:

Online Student Feedback System

2. Goal/Objectives

To provide students with the opportunity

- To provide feedback to lectures in order to improve delivery and/or content of the study units.
- To provide an opportunity to examine and expand the facilities available to the students
- To enhance the quality of the courses offered in terms of their effectiveness.
- To comment on the quality of their learning experiences, as required in preparation for and as part of review processes.
- To assess the success of academic provision in relation to the expectations of the students.

3. Context

Online Student Feedback System (OSFS) is a web application which provides a base to conduct student's feedback online. Feedback from students allows the institution to evaluate how its service provision is viewed by its most important group of stakeholders, namely the students. This system was initiated to override the problems that the students face in the institution. The students, in a convenient and consistent manner, can give their feedback about the faculty, the facilities and the courses offered to them during their period of their study. This system approaches all about institutional and educational practices and processes that are taken into consideration and the student's concerns of the level of the knowledge they receive. This procedure ensures that there is a good relationship between the students learning environment and the teachers.

4. The practice

The Online Feedback System is planned in a way where the students provide their feedback at three different levels namely the faculty, the facilities and the courses offered.

1. Feedback on Faculty: Twice in each semester, students are required to provide their feedback on faculty at regular intervals first, after the completion of the first three weeks of a semester and next, after the completion of the semester. This is proposed to gather systematic and periodic assessment of teacher performance. The primary intend of gathering student feedback on faculty is to enhance the teaching faculty and/or provide faculty that can cater to the learner's needs.
2. Feedback on Facilities: Annually, OFS tracks all the information on the feedback of the facilities provided by the institution. This is mainly intended to understand the requirements of the students and improve of facilities based on their requirements.
3. Feedback on the Courses Offered: Once in four years, as part of an exit survey, OFS also enables the students to provide their feedback on the course as a whole so that the future group of students is benefitted from their experiences.

5. Evidence of Success

The results of the student feedback process, as well as the recommendations and the action taken on the basis of such recommendations are important considerations for the program review which each department is required to undertake. By far, Online Feedback System has been instrumental in gathering the required information form students about the faculty, facilities and courses. It has also been an effective quality checking device that provides scope for improvement in various sections, thus enabling a positive learning environment for the students.

6. Problems Encountered and Resources Needed

Online Feedback System has been a very positive approach in gathering student's opinions. However, a few problems have been encountered which were divergent in terms of gathering productive feedback. In some instances, a few students were found to be deviating from what was required of them and thus providing biased responses. A few other cases of students not providing exact feedback and also showing low levels of interest were also registered.

The web portal designed by the Computer Science faculty requires computers, software and a good internet facility. It further requires man power to give proper instructions to the students about the system. Another requirement would be qualified and trained man power to analyze the gathered feedback effectively.

VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

Shamshabad - 501 218, Hyderabad.

(Approved by AICTE, New Delhi, Affiliated to JNTUH and Accredited by NBA)

COMPUTER SCIENCE AND ENGINEERING
End of Semester Course Evolution Form

Subject	: **DATABASE MANAGEMENT SYSTEMS**
Section	: **Computer Science and Engineering - IV Sem (Section - A)**
Academic Year	: **2018-19**
Faculty Name	: **XXX**
Designation	: **Associate Professor**

	INSTRUCTOR EVALUATION	To a very great extent (5)	To a great extent (4)	To a moderate extent (3)	To some extent (2)	Not at all (1)	%	Out of 5
1	Has the Instructor clearly stated the main objectives of the course ?	22	22	3	0	1	86.67	4.33
2	Has the Instructor given a clear presentation of the course?	23	14	9	2	0	84.17	4.21
3	Is the teaching well planned?	17	13	11	4	3	75.42	3.77
4	Was the Instructor enthusiastic about teaching the class and invited questions and comments from students?	21	19	7	1	0	85.00	4.25
5	Has the Instructor related course material to real life situations?	18	20	9	0	1	82.50	4.13
6	Have the Homework and other assignments helped you to understand the course material?	12	20	12	2	2	75.83	3.79
7	How well did the teacher prepare for the classes?	17	18	9	2	2	79.17	3.96
8	Have the textbook, lecture notes and/or Teaching aids contributed to your learning?	17	21	6	3	1	80.83	4.04
9	Has the teacher used ICT tools (Information and Communications Technology) in delivering the content.?	19	16	9	2	2	80.00	4.00
10	In general, has the instructor taught the course effectively?	24	16	4	4	0	85.00	4.25
	Overall rating of the teacher :	Out of 5 :	4.07	Percentage :			81.46	

	COURSE OUTCOMES.	To a very great extent (5)	To a great extent (4)	To a moderate extent (3)	To some extent (2)	Not at all (1)	%	Out of 5
11	Design and implement a database schema for a given problem domain	21	20	5	1	0	85.96	4.30
12	Construct Queries in Relational algebra, relational calculus and SQL	22	17	7	1	0	85.53	4.28
13	Apply Normalization techniques to reduce data redundancy in data base	18	22	6	1	0	84.26	4.21
14	Analyze various transaction control and recovery methods to keep data base consistent	19	15	11	1	1	81.28	4.06
15	Construct the file of data records by using appropriate storage and access structure	17	15	10	2	3	77.45	3.87
	Overall rating of the teacher :	Out of 5 :	4.14	Percentage :			82.89	
	Overall Feedback :	Out of 5 :	4.10	Percentage :			81.93	

Principal

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Best Practice – 5

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1. Title of the Practice:

Engineering Projects in Community Service (EPICS)

2. Objectives:

EPICS is a unique program in which teams of undergraduates are designing, building, and deploying real systems to solve engineering-based problems for local community service and education organizations. EPICS at Vardhaman are carried out with a team of 15 faculty for various departments in collaboration with IUCEE and Purdue University of the United States.

The main object of EPICS is

- Is to meet the vision of the college to address the societal issues and to make the students socially responsible
- Provide the viable solution for the problems stated by the community partner

The EPICS can be described as shown in the below figure that it will involve the students, Community and the problems
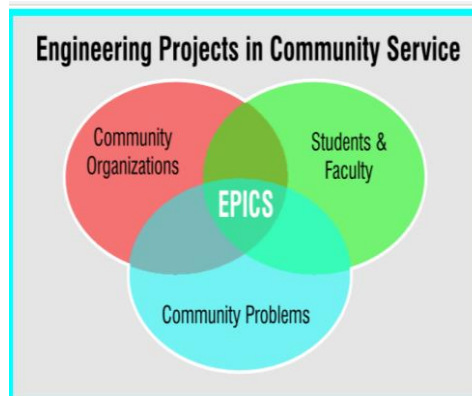
Community service agencies face a future in which they must take advantage of technology to improve, coordinate, account for, and deliver the services they provide. Society needs the help of people with strong technical backgrounds. Undergraduate students face a future in which they will need more than solid expertise in their discipline to succeed. They will be expected to work with people of many different backgrounds to identify and achieve goals. They need educational experiences that can help them broaden their skills.

EPICS students gain long-term define-design-build-test-deploy-support experience, communication skills, experience on multidisciplinary teams, and leadership and project management skills. They gain an awareness of professional ethics, the role of the customer in engineering design, and the role that engineering can play in the community. Community organizations gain access to technology and expertise that would normally be prohibitively expensive, giving them the potential to improve their quality of service or to provide new services.

Projects are in four broad areas: human services, access and abilities, education and outreach, and the environment. EPICS teams have delivered hundreds of projects to their community partners.

3. The Context:

The challenge is to bring the two groups together in a mutually beneficial way. It was specifically to address this challenge that the EPICS program was created. The end result Benefits to the students and to the community

The EPICS in IEEE program connects engineering with community service in four categories of community improvement effort:

- *Access and Abilities*—By bringing together student branches at universities, secondary students and non-profit organizations, there is a greater ability to solve accessibility issues within communities. As students learn to help their community or country through engineering projects, non-profit organizations establish themselves in order to maintain new and profound change. EPICS in IEEE Access and Abilities projects help enable adaptive services, clinics for those in need (such as children with disabilities), programs for adults and assistive technologies.

- *Education and Outreach*—EPICS in IEEE strives to help young students to discover the benefits of science, math, technology and engineering for their futures. Many projects give students hands-on experiences in order to stimulate their interests in those fields. Through these EPICS in IEEE projects, communities and schools lacking in strong engineering programs gain new curriculums along with new facilities in which to explore new areas of the topic.

- *Environment*—Engineering and science are key solutions to answering environmental issues. In communities in every region around the world, environments change with the evolution of technology and the need for sustainability. Many EPICS in IEEE projects concern themselves with new ways to create electricity and energy, recycling and the use of renewable energy sources. Through these EPICS in IEEE projects, young students learn about the impact of environmental issues and how engineering can be part of the solution. They also gain exposure to potential jobs with a growing demand for alternative energy and environmental solutions.

- *Human Services*—Through their experiences in Human Services EPICS in IEEE projects, students find connections between engineering and the tremendous scope of community needs globally. This includes homelessness prevention, affordable housing, family and children agencies, neighborhood revitalization and local government. Even after an EPICS in IEEE project is complete, lasting impact continues to be felt through the local non-profit organization's involvement.

4. The Practice:

Initially EPICS was carried out for six hours in a week where the students come voluntarily and work on the societal issue that they identified. Students went for survey in their first year and identified the problems in villages and they started working on the solutions. Every week on Tuesday afternoon and Friday afternoon they work on the solution.

EPICS faculty has been trained from Purdue University Professor, Dr. William Oakes Founder of EPICS at Purdue. The Design Thinking Course of six months was successfully completed by 15 faculties and these 15 faculty are the mentors for the students. In April 2018 Vardhaman has signed an MOU with IEEE and EPICS in Purdue to make this EPICS course in curriculum. In practice EPICS at Vardhaman has taken a different angle after signing MOU. As a part of which n now EPICS has been made a part of our Curriculum in R18 regulation. In the first year EPICS was introduced by two courses to built the basics and later they are introduced as Open electives. And the courses are

a. Social Innovation – 8 section (I sem CSE, IT & ME) & (II sem CSE, IT & ME)
b. Engineering Exploration - 7 section (I sem ECE, EEE & CE) & (II sem CSE, IT & ME)
c. Community Projects Introduction - II year
d. Open Elective - I and II – EPICS 1 and EPICS 2 – III year (Credit Courses – 3 each)

Eleven modules of Social Innovation and Engineering Explorations subjects are successfully.

5. Evidence of Success:

As a part of pilot program initially the prototyping was done and since 2017-18 the implementation phase has started and as a part of it five different projects and process have successfully completed.

There are twenty project under implementation phase out of which 8 will be delivered by the end of this semester.

1. **Automatic Drainage Cleaning System :**   A process of "Automatic Drainage Cleaning System" developed by EPICS students in collaboration with GHMC, Hyderabad has been a best recognition for EPICS VMEG
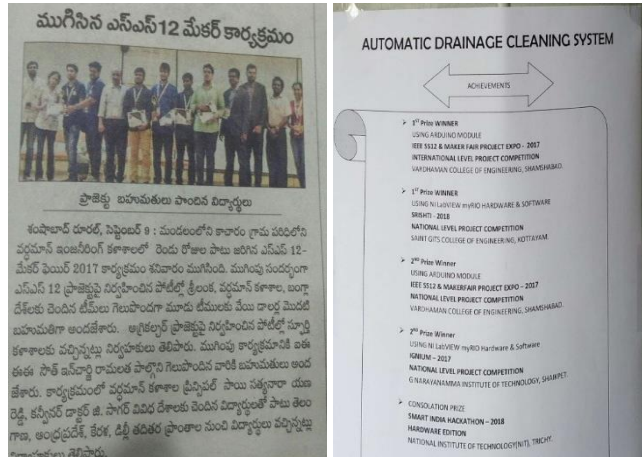
Proto typing of Automatic Drainage Cleaning System.

SMART INDIA HARDWARE
Projects at Hackathon can be game changers for sanitation workers

EXPRESS NEWS SERVICE
@ Tiruchy

SIX prototypes displayed at the Smart India Hardware Hackathon underway at the National Institute of Technology-Tiruchy (NIT-T) could be game changers for conservancy and sanitation workers if they become reality. The prototypes on display included an automated drain cleaning system, toxic gas detection equipment, and garbage picking machine.

NIT-T, one of the 10 nodal centres, is hosting the Smart India Hardware Hackathon under the auspices of the Ministry of Human Resource Development (MHRD) for five days and the event started on Monday.

As the theme is waste management, engineering students from different parts of India are working on their prototypes and making them work to get to the top.

Among six projects, the automated drain cleaning system and smart drain cleaning system exhibited by students of Telangana's Vardhaman College of Engineering and Andhra Pradesh's Kuppam Engineering College, respectively, are designed to help the conservancy workers. Explaining the automated drain cleaning system, C Lochan Reddy (20) of the Logistics team said, "On the way to our college, we cross a locality where drinking water gets contaminated with sewage and the drains are frequently clogged. This inspired us to develop a prototype. We conducted a field study and found that the gap between each sewage

> On the way to college, we cross a locality where drinking water gets contaminated with sewage. This inspired us to develop a prototype
>
> C Lochan Reddy, student

opening is 23 metres. The complete prototype was ready in five-and-a- half months and we have approached Corporation officials to show our project."

Lochan said their machine could be laid inside drains. So, whenever there is clogging, an alert would reach the concerned Corporation officials and the person in charge of the zone. The machine with robotic arms then unclogs the drainage channel.

Likewise, the smart drainage cleaning system by Kuppam Engineering College students can be operated manually by connecting the machine and a mobile phone with Bluetooth. The difference between smart drainage and automated drainage is the user can see the inside of the drain as there is a camera installed.

C Jyothsna of Electrical Levellers, one among the six who designed the machine, said they wanted to stop workers from dying when they manually clean drains.

"The blades of the machine unclog the blockage and helps free flow of drainage water. It took us three months to complete the prototype. We are yet to finalise the capacity and cost before making the device available commercially," Jyothsna added.

To save the environment from plastic, the Slick team has proposed technology developed for construction materials using molten plastic, marble slurry and sand with the aim of eliminating the use of water and cement.

INDIAN EXPRESS   Wed, 20 June 2018   epaper.newindianexpress.com/c/296622

2. Vegiee Composter (For farmers)

Seed Dryer (For farmers)

4. Renewable Energy sources for a smart house for Poor **(For construction of shelter to poor)**

The above project are going to get delivered to the Narkuda village head and the maintenance would be assured for two years.

Since there is a tied up of our college with five villages under Unnat Bharat Abhiyan, based on the feedback they will be delivered to the other villages as well.

Few upcoming projects and processes on which our EPICS teams are working are

Prototype of the Telengana ambulance project

Smart Medical Kit tied with an old age home,
Living tomorrow tied up with Trident Hospital, Shamshabad for emergency services.
Because of the our NSS team and few Alumni students working in Government sectors implementation of Processes would be possible.

6. Problems encountered and resources required

- Initially communicating with the community was an issues as villagers and the common public were not willing to spare time later with the help of NSS team the problem got solved
- Maintaining the zeal of working was destructed after some time the students get deviated bringing them back is a biggest challenge.
- Conducting a non credential course was a biggest problem which was solved by R18 regulation
- Funding for the projects was an issues which was also solved by the college management that a fund of Rs.2,35,000/- was granted and as an initial phase Rs. 50,000/- spent.
- Now after the MOU has Signed IEEE is also agreed to fund for the project

7. Notes:
Final note is that the students will obviously grow up with social responsibility and they will be ready to solve any kind of right time problems and gives real time solutions for it.

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Best Practice - 6

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1. Title of the Practice: Innovative teaching to achieve Program Outcomes

2. Goal:

- Practice Student Centric Learning
- Strengthen technical Skills through Course-End Projects and interdisciplinary projects
- Usage of Technology in teaching learning practice

3. The Context:

Innovative teaching (Active learning) is necessary for the present and future of education to help students to reach their full potential. Higher education should serve the long term intellectual needs of the student, for example, whether providing new material by teachers helped the student to gain new insights or opened up new channels of intellectual stimulation or enhanced student's essential and creative thinking power.

Innovative teaching is necessity for all teachers in order to meet the educational needs of the new generations. However, teachers' competency for innovative teaching is a key factor influencing innovative teaching performance.

The purpose of education is not just making a student literate, but adds rationale thinking, knowledge ability and self-sufficiency by including innovative communication methods that impart knowledge like multimedia, the combination of various digital media types such as text, images, audio and video, into an integrated multi-sensory interactive application or presentation to convey information to the students.

Creating opportunities for students to actively shape innovation in learning and teaching also puts them at the heart of our strategy. We will develop novel ways to work in partnership with students, enable them to co-create innovative teaching practices, and employ them as teaching assistants in classrooms and in online and digital education communities.

4. The Practice:

Vardhaman College of Engineering follows Outcomes-based Education (OBE) approach. Faculties of the college use innovative teaching methods and techniques to fulfill the needs of outcome based education system. Following are some pedagogical initiatives taken by faculty of vardhaman college of Engineering include role-playing, case studies, group projects, think-pair-share, peer teaching, debates, Just-in-Time Teaching, and short demonstrations followed by class discussion.

Students of different learning levels facing problems in Technical Education, which can be overcomed by cooperative learning in the classroom like "Think-Pair-Share",and STAD etc

We at vardhaman College of Engineering encourage the students to do more projects during their graduation period . The projects which the students implement during their course should be useful to community development. By doing projects at course level , students will be more interested in research work.

These projects are exposed to the high school students in order to create interest in high school students in pursuing an engineering related career path.

5. Evidence of Success:

Active learning has enhanced the team spirit, learning capabilities and Technical skills of the student. It created an environment to think more about technology ,research and societal problems and find a solution for the problems around them, which also created a responsibility towards addressing the societal problems. Many of the students are part of research projects leading to Patent publications, Startups and few startups are initiated in the campus related to Day to day student life problems. Students have started finding solutions for their existing problems they come across in

student life Rather than reading the textbooks or listening to the lecture, the classroom teaching is made interactive improved the retention skills. The proactive involvement in course based projects enhanced the team spirit and motivated towards participation in National and State level competitions. The student success rate improved and this is reflected in quality and statistics of the placements. The employer's feedback is a clear testimony of this claim.The students opting for international studies are able to come up with good grades and involve in research because of the self and interactive learning aptitude.

6. Problems Encountered and Resources Required:

Active Learning Classrooms is present challenge for teachers and their students who are used to more traditional classrooms and lecture situations.

Active learning classrooms contrast with traditional classrooms that are designed with students facing forward and arranged in rows. In traditional classrooms, student sightlines are orientated towards the teacher's black board. In such traditional spaces, students are expected to take notes during the presentation of classroom material. The arrangement of desks in rows is suited to the transmission of information from the instructor to the students, however, the physical constraints of the seating make it difficult to prioritise student-student interactivity.

Active Learning Classrooms, on the other hand, are designed to enhance small-group involving a facilitative teaching role.

The teacher should normally position themselves in the centre of the room to address the whole class and to monitor the students working in tables groups to check their understanding. Students should respond to their teacher's movement within this central space by re-orientating themselves.

An Active Classroom needs to be continuously managed. Activity can create multiple distractions. These include noisy small group conversations, audio from other student's laptops, the changing projections on each of the groups' video screens, white boarding activities, and the constant movement of the teacher.

Active Learning Classrooms are often characterised by unfamiliar technologies and this can undermine the teacher's confidence.

Plan sessions in detail when starting to use new methods. In particular, decide on how technologies will be used and, before your session, check that they work in the way you anticipate.

Best Practice – 7

1. Title of the Practice:

Imparting Domain Specific Skill Set to Students

2. Objectives of the Practice

The objectives of affective domain include self-awareness and expression of feelings. Objectives of the psychomotor domain include muscle coordination. A rubric of optimal outcomes, for instance, can then help teachers observe how well each student is performing in the affective domain in education.

a) Embraces New Learning Challenges
b) Shows Empathy and Compassion
c) Learn new information about themselves or their surroundings
d) Able to tolerate and develop interest in the subject matter
e) Motivate individual's ability to make choices that are morally consistent with his/her knowledge of the world

3. The context

The constant challenges posed by the students inside the class room through their unique and innovative questions propelled us to adopt such methods. The various seminars, speech by professors from eminent institutes and universities, conferences organized in the field of Technological and science helped us to come up with the idea of domain specific trainings. The course specifically focuses on problem solving attitude and students from unique socio-economic and political background helps us to encounter huge amount of issues that needs to be solved in India. Hence, the everyday issues of the students and the unemployment problems are some of the reasons for implementing such an approach.

4. The Practice

The institute has 7 departments: Civil Engineering, Mechanical Engineering, Computer Science Engineering, Electronic and Communication Engineering, Electrical and Electronics Engineering, Information Technology and Humanities and Science. All these departments are further divided into four domains. Each domain is equipped with highly qualified faculties and required equipments for the students. The functioning of the domain changes as per the feedback of the students. The main aim of the domain is to promote research oriented approach or learning which are relevant to job market. The trainings are also designed as per the requirements of the needs of the society that helps us to find the problem and come up with the solutions. Some of the features are:

a) Conferences conducted for the department on the subject matter
b) Trainings related to the domains by the industry experts
c) Certification courses
d) Presentation of students in the science fair

5. Evidence of success

The success rate of the graduates from the institute from last 20 years in itself is the evidence. The college provides courses which are apt for the department and it is relevant to the industry. The students have been able to prove their skills in the various platforms apart from the job.

a) Increase in the number of placement every year
b) The placement of the students in domain specific companies and jobs
c) Presentation of students in the various conferences
d) The participation of students in the national and international Science and technology fair

6. Problems encountered and Resources required

The institute offers various courses and every student aspire to take-up projects on unique fields, however, the problem lies in the acceptability of the projects in the job market and lack of funds due to the cost involved in buying the equipments.

a) **Acceptability of Research projects in the job market:** Approving any project is not an issue for the institute; however, it should have some relevance in the job market. The constant changes in the field of technology at times de-validate the outcome of the project.

b) **Lack of sufficient fund:** The institute has the limited amount of funds for the different projects and that fund needs to be equally divided among the different students. However, there are some projects which require lots of expensive tools and equipments, which becomes the major problem for the institute to substitute or provide extra funds.

Application of used equipment: The institute needs to make sure some of the expensive equipments are utilized properly and are still relevant as per current development.

Best Practice – 8

1. Title of the Practice:

Extension Lectures for skill enhancement

2. Objectives

Each student at the Vardhaman college of Engineering undergoes extensive training through Skill Enhancement Program (SEP). This practice aims at conducting various extension lectures focusing on

- Personality Enhancement
- Employability Enhancement
- Job Specific skills development
- Soft Skills Development like Communication Skills, Presentation Skills, Interview techniques, Public Speaking etc.

This practice thus ensures our graduates possessing a right blend of knowledge, skills and attitude to be successful.

3. The context

The engineering curriculum followed by most of the engineering colleges today is currently not aligned with the industry expectations for providing employment for engineers. SEP is an exclusive program for the engineering students, supporting to bridge the knowledge and skill gaps of engineering graduates in line with the employers' expectations. The SEP is aimed to provide basic understanding on practical applications of Engineering, Safety management and behavioral skills that is essential for every engineer to have, before taking up employment with any organization. The SEP program will improve the employability of an engineer and helps industries to deploy the newly selected engineers at work directly and focus on their further development.

4. The Practice

Any skill enhancement and development programs designed for enhancing the capability of engineering students need to focus the deliverables of engineering graduates at work. In general as routine activities, an Engineer at work is not expected to use spanners, screw drivers or open & close valves in process plants. Engineers' deliverables include, review and update procedures, provide technical input in design and operations support, make various decisions, manage best practices, manage operation and maintenance of plant equipment, etc. Engineering students need to have high level of technical understanding to deliver engineers' role efficiently.

The Skill enhancement program (SEP) at the Vardhaman college of Engineering will be delivered by engineers having many years of real time experience in training and assessment with major national and international companies including Infosys, TCS, IBM, etc. This program is designed to deliver interactive sessions with many relevant case studies, videos, assignments & exercises for students in groups and individually according to the requirement of the outcomes.

5. Evidence of success

In recent times, investment in training and skill development has come to be considered as an asset for any educational and technical training institute. In fact, it is safe to say that Skill enhancement and industry oriented training is indispensable for effective engineering teaching and learning eco system and institutional development. Therefore, the credibility of any training program for students lies in its usefulness and significance to the needs of both the students and the teachers in an institute or an

organization at large. The traditional method of skill enhancement training and development was to collect immediate feedback of the students. This hardly indicated learning in terms of knowledge, skills and attitude and its transfer to the actual application of the skill in an engineering job. Measures are developed to record and understand the widest possible spectrum of the effects of training and not just whether the training program was meaningful or successful. During the course of such evaluation efforts being adopted by us, it was felt that certain issues and some interesting facts were worth pursuing through research, which may help not only the students but also the efficacy, relevance and effectiveness of the faculty of our college.

6. Problems Encountered and Resources required

While a sizeable portion of teaching resources are diverted into strategic areas of technical skills enhancement and development of the students, there should simultaneously also be endeavors to explore and study the various factors that affect training and development right from the identification of student needs, selection of suitable students for particular courses and also the suitable faculty and resource persons for the methodology of the training process, the supporting climate provided to students in the college, the ensuing impact of training on the students' efficiency and its effect on the college. A study of such factors would help in clearly understanding and appreciating the various underlying factors and also to specify the variables that affect outcomes. Although huge investments are put in training and skill development, very little research has been done in studying and evaluating its impact and in trying to improve effectiveness of skill development from the point of view of the training institutes and colleges. One aspect that our practice is focused on is the factors that help and / or hinder the transfer of learning to the job. However, the main idea is to evolve criteria for evaluating training and the application of acquired knowledge and skills to the job.

Best Practice – 9

1. Title of the Practice:

Course end projects to foster experiential learning

2. Goals:

Course End Projects – organized education is an effective means of improving the quality of education as it gives hand on experience where the students can easily apply, analyze and create their own ideas. The learning experience is student-focused, not teacher-centered. The learner is an active participant in the generation of knowledge. The skill set and experiences gained through experiential education programs form a foundation that can be applied and adapted to real-world scenarios and problems in the future. The purpose of this practice is to insist on students to do projects at the end of the course so as to articulate the theoretical facts to correlate with the real world situations.

3. **Objectives:**

The objectives of experiential learning with primary focussed outcome of course end projects are to

- Increase knowledge of engineering process including concept, requirements, design, build
- Develop ability to apply basic math/ engineering skills
- Learn about environmental constraints in engineering
- Learn about safety issues in engineering

The Context:
The students exhibit the experiential learning targeting the four skills as mentioned below

Experiencing/Exploring "Doing" :

Students will perform or do a hands-on minds-on experience with little or no help from the instructor. Examples might include: Making products or models, role-playing, giving a presentation, problem-solving, playing a game. A key facet of experiential learning is what the student learns from the experience rather than the quantity or quality of the experience.

Sharing/Reflecting "What Happened?" :

Students will share the results, reactions and observations with their peers. Students will also get other peers to talk about their own experience, share their reactions and observations and discuss feelings generated by the experience. The sharing equates to reflecting on what they discovered and relating it to past experiences which can be used for future use.

Processing/Analyzing "What's Important?" :

Students will discuss, analyze and reflect upon the experience. Describing and analyzing their experiences allow students to relate them to future learning experiences. Students will also discuss how the experience was carried out, how themes, problems and issues emerged as a result of the experience. Students will discuss how specific problems or issues were addressed and to identify recurring themes.

Generalizing "So What?" :

Students will connect the experience with real world examples, find trends or common truths in the experience, and identify "real life" principles that emerged.

Application "Now What?"

Students will apply what they learned in the experience (and what they learned from past experiences and practice) to a similar or different situation. Also, students will discuss how the newly learned process can be applied to other situations. Students will discuss how issues raised can be useful in future situations and how more effective behaviors can develop from what they learned. The instructor should help each student feel a sense of ownership for what was learned.

4. The Practice:

- Experiential learning occurs when carefully chosen experiences are supported by reflection, critical analysis and synthesis.

- Experiences are structured to require the student to take initiative, make decisions and be accountable for results.

- Throughout the experiential learning process, the student is actively engaged in posing questions, investigating, experimenting, being curious, solving problems, assuming responsibility, being creative and constructing meaning.

- Students are engaged intellectually, emotionally, socially, soulfully and/or physically. This involvement produces a perception that the learning task is authentic.

- The results of the learning are personal and form the basis for future experience and learning.

- Relationships are developed and nurtured: student to self, student to others and student to the world at large.

- The instructor and student may experience success, failure, adventure, risk-taking and uncertainty, because the outcomes of the experience cannot totally be predicted.

- Opportunities are nurtured for students and instructors to explore and examine their own values.

- The instructor's primary roles include setting suitable experiences, posing problems, setting boundaries, supporting students, insuring physical and emotional safety, and facilitating the learning process.

- The instructor recognizes and encourages spontaneous opportunities for learning.

- Instructors strive to be aware of their biases, judgments and preconceptions, and how these influence the student.

- The design of the learning experience includes the possibility to learn from natural consequences, mistakes and successes.

5. Evidence of Success:

The following are the benefits of experiential learning and it could enhance the learning levels in terms of achieving the higher levels of cognitive thinking.

- Provides practical experience and applications of knowledge for better understanding

- Fosters an interest and connection to lifelong learning

- Develops critical and abstract thinking skills for better problem solving and relationship building

- Offers an opportunity for deep reflection (a core component of experiential learning) and feedback, as well as the ability to process, learn and benefit from constructive criticism

- Helps participants learn how to meet new challenges and "think on their feet" through navigating unfamiliar and unexpected situations on a physical, intellectual and emotional level

6. Problems Encountered and Resources Required:

Challenges to consider for the implementation of experiential learning are limited class time, inadequate group work skills, and ethics/privacy and anonymity issues, accessibility to resources. The deep involvement of course instructors and learners in this process is required for the successful implementation.