R & D – EMERGING METHODOLOGIES IN ENGINEERING EDUCATION AND INDIA'S FURURE

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Abstract— This paper demonstrates some of the objectives of role of research and development in technical education and some of the innovations that one can make use of in shaping up the mindset of fraternity involved with technical education. Further this paper demonstrates various innovative ways of working in Atmiya institute of technology and science, Rajkot that has produced some great effects in cultivating the inter and multidisciplinary projects to be carried out by the students and faculty members of the institute.

I. INTRODUCTION

Role of Research and Development in Technical Education and innovation in information and communication technology are the topics that are necessarily to be focused and covered with a great impact nowadays because the scenario in the education has totally changed from the old teaching process to teaching and learning process. The involvement of technology in the education and globalization through the medium of internet has boomed the availability of the material and hence the information level has increased from expensive hardcopy of a book to one touch softcopy of many reference books freely available for the usage. The requirement of education now is to be the involvement of this kind of technology and some innovative steps in the technical education so as to make the outcome a skillful person rather than a passed out student.

At Atmiya institute of technology and science, Rajkot for increasing the research awareness and for the purpose of producing skilled person, there exists a group called Research Commons with a tag line "Synergizing the efforts towards a Research & Innovation Ecosystem".

The main objectives behind this group formation are:

1. To create a conducive ecosystem for promotion of research & Innovation on the campus for both students and faculty.
2. To support and monitor the research & Innovation activities on the campus and also create Opportunities and Avenue for interdisciplinary & multidisciplinary research.
3. To facilitate the training of Research skills
4. To facilitate the process of proposal submissions for funding from different funding agencies
5. To showcase the innovations and research at University, State, National, International Level.
6. To facilitate and provide training and consultation on IPR issues for the Innovations done by the students & faculty on the campus
7. To inform the authorities of individual departments; head of the institutions and also the management about the potential projects/ research work happening on campus.

1. Tech-Idea

We thought of an event wherein students need to present an innovative idea in front of the subject experts. Later on we actually gave name to the event i.e. Tech-Idea, 2013 which is a one day event organized on 9th March, 2013.

We had a great response for the participants from various departments as per the statistics shown below. Some of the students participated individually and some of them contributed in group. The students from 6th and 4th semester participated in the event.

We have had ideas from technical side either for the improvement of already developed products or for the benefits of the society. Some ideas are given taking utmost care of physically handicapped and blind people.

The following table shows the analysis of the entries received.

Sr. No.	Department	Total No. of Ideas	Total No. of Students
1	Electronics & Communication Engineering	27	52
2	Instrumentation & Control Engineering	14	19
3	Mechanical Engineering	6	8
4	Electrical Engineering	15	16
5	Computer/Information Technology Engineering	16	32
Total		78	127

Some of the snaps of the events are shown in the figure below.

2. Scholars Studio

After the successful completion of tech-idea 2013, we thought of an event where work of yogidham gurukul already done is to be showcased. We designed the event name **Scholar's Studio** wherein the event will showcase the best two projects/dissertations of the departments from across disciplines on the campus of Yogidham Gurukul; each of the project/dissertation will be given 5 minutes time to present their work. Hence we given the tagline to the event that "**Showcasing the INTELLECTUAL Output of Yogidham Gurukul**".
Students need to answer only three questions:-

1. What is the project/ dissertation all about? (Area of Study)
2. Why is it significant? (Objectives/Research Questions)
3. How has it been done? (Methodology/ Demo)

If the project is portable they can even carry it along or give a presentation of the same in the form of PPT or Video.

There was not any evaluation; the objective was to provide a platform for multidisciplinary avenues for research; the faculty in charge of the project/ dissertation was also requested to be present at this event. This was proved to be good opportunity to present the project/dissertation to multidiscipline intellects.

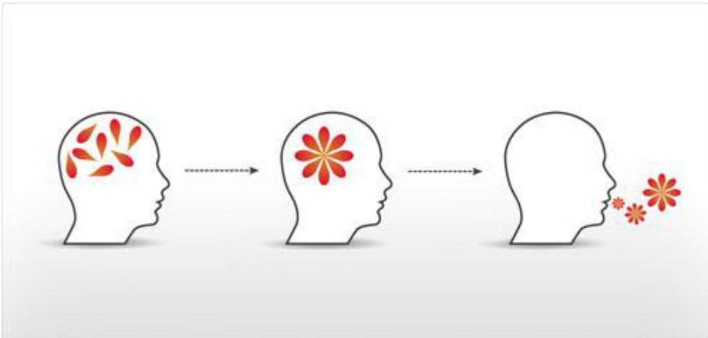
The presentation was required to be made in simple language so that even a common man can understand the research done by the Students.

We were in a hope this concept will get you excited as much as we are excited hosting it. This will help us create a good Research Ecosystem at the Campus in the near future.

Main objectives for this event were:

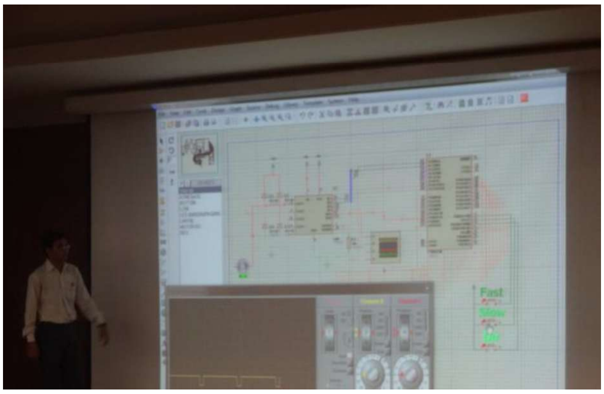
1. To Provide Opportunities and avenues for Interdisciplinary/ Multidisciplinary project/ Research
2. To Know about campus departments and their research areas/ profile
3. To Extend your horizons and scope of research

We have the following image as an idea of scholar's studio wherein cultured ideas are combined and then it is expressed.



The following table shows the presentation schedules and the area of presentations As it can be seen that we had 37 different projects/models from across the yogidham gurukul.

Here are some of the pics of the event.



4. **Tech Product**

The main motive behind the event is to convert the idea into a product and the tagline of the event is *Innovativeness in daily used products.*

<u>Rules of the competition:-</u>

1. Any student can participate in this competition.
2. Students can participant in a group with maximum of 3 members / group.
3. A group needs to take a product which is used in day to day life and make it more efficient by adding the knowledge of engineering and technology.
4. Product should be a live working model either in hardware or software.
5. Inputs or contributions in designing the product can be made in terms of
    - Feasibility
    - Economical
    - Compactness
    - Ease of use
6. Products that are dealing with recycling /regeneration/ Environment sustainability issues/ social innovation would be highly appreciated.
7.

Following table shows the result of the same

ATMIYA INSTITUTE OF TECHNOLOGY & SCIENCE

RESEARCH COMMONS

TECH PRODUCT 2013

EVALUTION CARD

Group No	Name of Students	Feasibility	Economical	Compactness	Ease of Use	Usefullness to Society	Total Score
1	Jay Patel Vipul Nathani	8	5	5	8	6	32
2	Param Mehta	6	5	5	6	5	27
3	Kishan B Kalolia Kashyap B Kalolia	8	9	8	8	8	41
4	Monali Y Minipara	5	7	5	7	7	31
5	Makadia Hiral Sardhara Chandani	5	6	7	7	8	33
6	Senjariya Kunal Finava Shiv Sata Akshay Amravatiwala Zohair	6	5	6	7	7	31
7	Kadecha Rohit Moghal Kishan	7	8	8	8	8	39
8	Chhatbar Kartik Lamin Andrews Ajay Sariya Bhargav Mishra	9	9	9	8	8	43
9	Sahel Meswania Roshan Savlani Jankiba Zala	7	8	7	9	8	39
10	Jay Patel Vipul Nathani	9	9	8	9	9	44
11	Vipul Nathani Jay Patel	7	8	8	8	7	38
12	Vivek Ghevariya Vishal Dudhatra Kiran Mode	2	2	2	3	3	12
13	Tarpara Nikita Raoarka Ekta Nimavat Hetal	3	2	2	3	3	13
14	Vora Niraj	6	6	5	6	5	28
15	Mekhiya Brijesh Milan Desai	8	6	6	5	5	30
16	Kajalba Chudasama Vaishali Modha	2	2	2	3	3	12
17	Parmar Viraj	3	3	2	3	2	13

Top 3 Groups

10	Jay Patel Vipul Nathani	9	9	8	9	9	44
8	Chhatbar Kartik Lamin Andrews Ajay Sariya Bhargav Mishra	9	9	9	8	8	43
3	Kishan B Kalolia Kashyap B Kalolia	8	9	8	8	8	41

Conclusions

Atmiya Institute of technology and science has created a pool of resources and opportunities in the form of activities as described above to encourage a research and development spirit in the students and the faculty too. From our experience we can positively state that it needs a bit of interest and going an extra mile to imbibe in the present generation students who are curious enough to know how they can apply the concepts of what they study in real time and actually see to themselves how the different theories or laws can be justified. Thus creating these kind of ecosystem gives a boost to students enthusiasm of learning and exploring what is unknown.