



Student Start-up Support System  
(S4)



Gujarat Technological University  
(GTU), Ahmedabad



GTU Innovation Council (GIC)

## **Design Engineering – 1B**

### **A concise Report on the 1<sup>st</sup> Faculty Development Program (FDP) – 4<sup>th</sup> semester**

Date: 31<sup>st</sup> January, 1<sup>st</sup> and 2<sup>nd</sup> February 2015

Venue: 126, ACPC Building,  
GTU Innovation Council (S4-CiC3),  
L.D. Engineering College, Ahmedabad

**GTU's Centre for Industrial Design (OPEN DESIGN SCHOOL)** is engaged in introducing design driven innovation at GTU. With this objective in mind, GTU has introduced a very new, innovative - Design Engineering subject in 3<sup>rd</sup> semester, it is a first of its kind initiation in Indian Education System. A strong 6-semester spine of Design Engineering has been included in the syllabi. To move a step forward in this direction, GTU's Centre for Industrial Design (OPEN DESIGN SCHOOL) had conducted a series of seminars/workshops, in the year 2014, to sensitize the design driven innovation intervention for 3<sup>rd</sup> semester and final year projects and create a framework for the same. 8 Faculty Development programs (FDP) were organized in the months of August to November, 2014. In all, 590 faculty members have participated in workshops for Design Thinking methodology from approx. 115 Engineering colleges and 20 different Engineering disciplines throughout Gujarat state.

After the successful delivery of eight FDPs during 2014, GTU - Design Team planned the 9<sup>th</sup> Faculty Development Program (FDP) of the academic year. Approximately sixty faculty members participated in this FDP. The aim of this FDP was to prepare common guidelines for 4<sup>th</sup> semester students for Design Engineering – 1B subject after various brainstorming and discussion sessions.

### **Day 1 : 31<sup>st</sup> January 2015, 10.30 AM onwards**

The first day started with eagerness among the participants regarding 4<sup>th</sup> semester syllabus and guidelines for Design Engineering – 1B subject. Participants were divided in to 12 teams based on their branch. *Prof. Karmjitsinh Bihola – GTU Design Team* discussed the syllabus and guidelines for the 4<sup>th</sup> semester in the first session. Then, *Mr. Ashok Gupta – discussed* different case studies based on Design Thinking. The participants were asked to analyse more case studies on their own and to also present their thoughts about Design Thinking process through the case studies. *Mr. Abhishek Dwivedi - Initiator (Strategies and Smiles)*, concluded the session with the explanation of approaching user for Interview to get basic insights about the user perspective.



*(Case study Analysis Session – Mentors and Participants)*

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Ms. Devina Kothari, an Industrial Design Innovation Specialist, from Rajkot gave a presentation of her own projects in which she applied this amazing technique of Design Thinking. She explained how design thinking impacted her projects and how she derived creative and innovative solutions out of it.



*(Ms. Devina explaining impact of Design Thinking on Industrial Product)*

Prof. Bhasker Bhatt (SCET, Surat) who was our chief mentor started with bridging the 3<sup>rd</sup> semester Design Engineering – 1A and 4<sup>th</sup> semester Design Engineering – 1B syllabus

to make sure all participants are on the same page. After this small brainstorming session he asked newly formed teams to prepare their Product Development canvas and get validated the same quickly.



*(Prof. Bhasker Bhatt explaining Observation and validating techniques)*



**Day 2: 1<sup>st</sup> February 2015, 10.30 AM onwards**

**The** second day started with discussion on the idea of teams that they have prepared through Product Development canvas on Day-1. Prof. Bhasker Bhatt explained AEIOU<sup>1</sup> (Activities, Environments, Interactions, Objects, and Users) technique of observation for Design Thinking with the help of Observation Record Sheets which were prepared to help students while they are in the field to record their observations. Participants were more curious about this new technique as it is simple and very useful.

*Dr. Akshai Aggrawal (Honourable VC – GTU)* guided all the participants about the subject and its curriculum. He suggested to the Faculty Members to guide students for adopting *Branch Specific projects* which in turn help industry and society around us.

Then listened to the suggestions for guidelines for the 4<sup>th</sup> semester students for Design Engineering – 1B subject and policy points so that the subject may be learnt well in all the affiliated colleges.



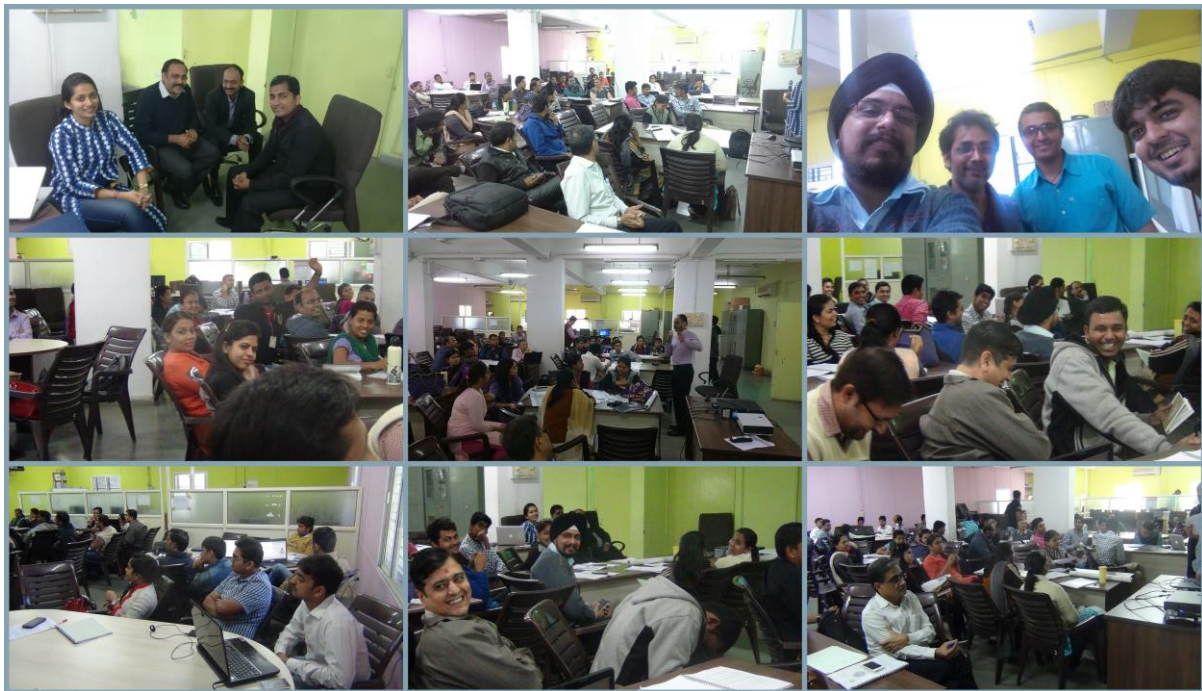
*(Honourable VC sir motivating Faculty Members for subject improvement)*

**INTERVIEWS WITH USERS:** After explanation of the Interviewing Techniques, participants were went out to places near LD College along with their team members. Their task was to identify their User, related to their project/product, observe them with the help of AEIOU technique, record their observation on Observation Record Sheets and interview them to revalidate their ideas. As they came back from field work summarization, a small presentation session was held to share their experience with the users.

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*(Participants Presenting their Ideas and Thoughts)*



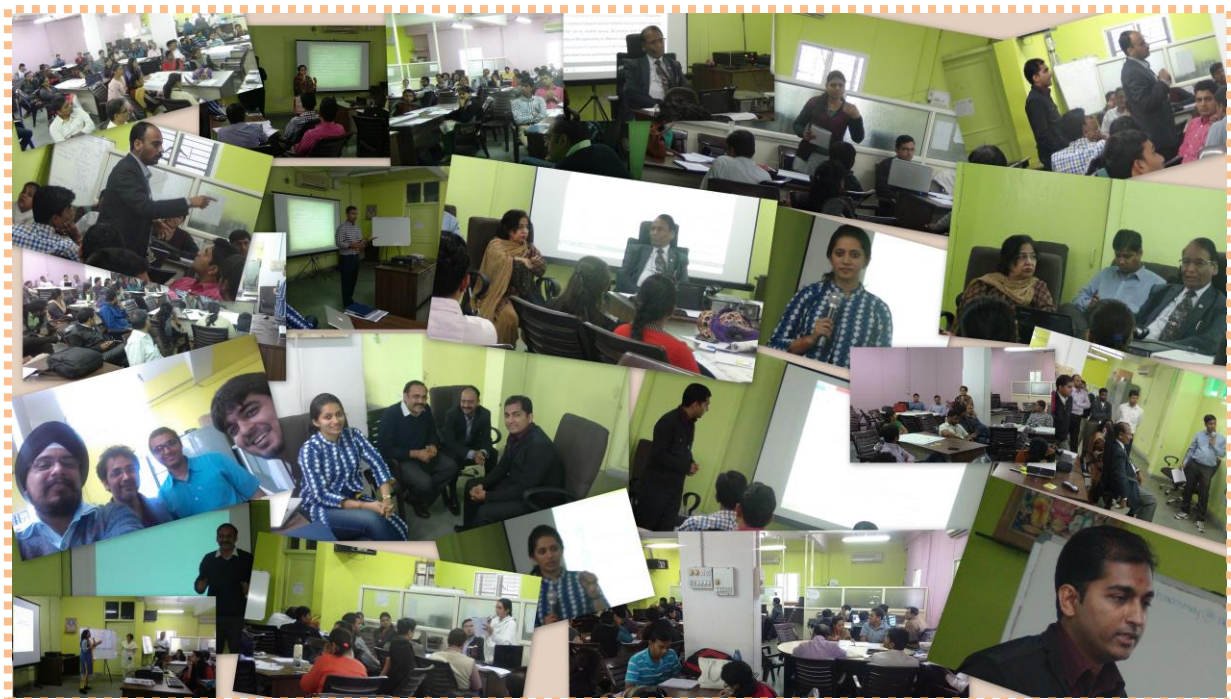
*(Participants in light mood – All were enjoyed the workshop activities)*



**Day 3 : 2<sup>nd</sup> February 2015, 10.30 AM onwards**

On the final day, tasks ahead of the teams were to finalize their idea with preliminary design and fast prototyping. Based on their observation on field and interview with users, they were guided for their pre-design phase.

Prof. Bhasker Bhatt explained the **Learning Needs Matrix** as a part of the 4th semester Design Engineering – 1B study. This matrix helps students to identify their branch specific skillsets like theories/ principles/ methods/ tools/ experiments/ use of software/ applicable standards/ design specifications which may or may not be in their syllabi. These skillsets are useful to students to complete their projects/products with specific competency level.



Also, *Prof. Amit Patel (IPR officer – GTU)* and *Prof. Gagandip Singh Khanduja* made a very good presentation of basics of IPR, how to protect one's idea through patent, what sets of activities GTU is doing in field of IPR etc.

In the end, from various brainstorming and discussion session on all the three days, guidelines for 4<sup>th</sup> semester students for Design Engineering – 1B subject were finalized. Also *Mr. Hiranmay Mahanta - GIC* motivated all Faculty Members for implementing pedagogical intervention for improvement of Design Engineering subject by giving numerous examples in which we can find enormous impact of Design Thinking.

### **Feedbacks from participants:**

To get the participants' feedback, we divided FDP experiences into five areas:

#### **Reason to attend the FDP:**

- ✚ To understand Design Engineering concepts through brainstorming and team work for DE-1B. Discuss syllabus and guidelines for the subject
- ✚ To get in-depth knowledge about what sort of areas are to be explored in DE-1B.
- ✚ Basically, the entire experience of DE-1A FDP was very useful and full of knowledge which was really ice-breaking for the thinking process.
- ✚ The main motive to come for FDP is to have hands on ideas for implementing DE in 4<sup>th</sup> semester. Also, share and discuss the experiences of the participants, while implementing the subject during the 3<sup>rd</sup> semester to learn about the best practices, followed by the others.

#### **Concerns about Design Engineering 1(B):**

- ✚ The subject must be executed in the proper manner and as per given guidelines in all the affiliated colleges to get fruitful outcome from students' ideas.
- ✚ The subject should be adopted by students to identify & solve the problems of society and give them enough time to derive the solutions. For the second subject of the spine of DE courses, a revision of the first semester's learning material may be required.
- ✚ Iterate Product Development canvas as many times as possible with fast prototyping. To find out the problem or get better empathy of the user, the Observation Record Sheets will help a lot.
- ✚ Interdisciplinary/Intercollege projects should be adopted and should be better channelized for proper evaluation purpose. Mid-term audit can help to monitor all activities related to Design Engineering subject in the affiliated colleges.

#### **Influence of FDP on Faculty's Learning Pedagogy:**

- ✚ FDP helps to organize Design Thinking activities for the upcoming semester. Team work really strengthens the ideas and projects.
- ✚ This FDP has cleared many concepts of Design Engineering. The 4<sup>th</sup> semester plan of actions has been worked out by all the participants jointly. The overall experience of live & past case studies has enhanced the understanding of thinking process.
- ✚ There would be exponential development in the field of Innovation, Patent filing and Make In India concept if this subject is implemented properly.

- ✚ Earlier way of Thinking : read, learn, grasp, think, and teach;  
Revised way of Thinking: look, observe, think, grasp, read, learn, and teach.
- ✚ Design Engineering subject has created gigantic waves of Innovation among all the Faculty Members and student community of affiliating colleges. Also it broke the philosophy of just redesign the existing product/project and name it as an innovative work.
- ✚ FDP for Design Engineering enhanced our thought process towards achieving outcome based – Society oriented education.

**Key learning points from FDP:**

- ✚ Numerous tools & techniques for *Proof of Concepts* like AEIOU - Five vowels of Design Engineering to strengthen the ideas; Observation Record Sheets; Learning Needs Matrix; Fast Prototyping; Live examples and case studies; Data collection techniques etc.
- ✚ Inspired by interactive session with *Ms. Devina Kothari - An Industrial Design Innovation Specialist* - Empathizing tool to fill up the gap between user, researcher and market.
- ✚ Streamline of Design Thinking process starting from observation –Empathy –Ideation – Product Development along with the Fast Prototyping.
- ✚ Very nice presentation and explanation for Prior Art Search activities which broaden the knowledge to protect our intellectual Property rights.
- ✚ Field trip is very essential; Look, learn, ask and try. Observation is the key; be it silent or while interviewing. Analyse each and everything minutely.

**Thought on improvement in Class via FDP:**

- ✚ First make students think about “how to make an innovative project?” Then will collect and summarize their ideas and then divert them towards ‘Design Thinking Process’. Afterwards direct them to the various aspects of curriculum, and make them learn the subject with greater interest.
- ✚ Monitor all projects by using log book or flow chart every 15 days to check whether students are following the guidelines or not. Fieldwork is compulsory to evaluate ideas. Case studies discussion will help in understanding of subject much better.
- ✚ Awareness of subject through workshops/seminars at Institute and zone level. Sharing experiences of FDP with other faculty members & motivating them to attend the next set of FDPs.



- ✚ Motivate students by announcing awards to best three projects from each department; Arrangement of inter-department canvas exhibition. Allow for friendly environment to get innovative ideas.

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<sup>1</sup> AEIOU is a frequently used framework for guiding and structuring observational research. The framework creates a taxonomy of observations under the themes of Activities, Environments, Interactions, Objects and Users and is commonly used for coding observational data.

Organisational frameworks help researchers and designers to capture key details in observation, and AEIOU is a very easy mnemonic device to remember what to look for and write down. The structure is also a helpful framework for using observational material in design and innovation workshops.

Reference: <http://www.doctordisruption.com/design/design-methods-8-aeiou/>