



Student Start-up Support System  
(S4)



Gujarat Technological University  
(GTU), Ahmedabad



GTU Innovation Council (GIC)

## **Design Engineering – 1B: 4th semester**

### **A Concise Report on 10<sup>th</sup>-14<sup>th</sup> Faculty Development Program (FDP)**

Date: 16<sup>th</sup> – 18<sup>th</sup> February, 2015 (10<sup>th</sup> FDP)  
20<sup>th</sup> – 22<sup>nd</sup> February, 2015 (11<sup>th</sup> FDP)  
26<sup>th</sup> – 28<sup>th</sup> February, 2015 (12<sup>th</sup> FDP)  
2<sup>nd</sup> – 4<sup>th</sup> March, 2015 (13<sup>th</sup> FDP)  
9<sup>th</sup> – 11<sup>th</sup> March, 2015 (14<sup>th</sup> FDP)

Venue: 126, ACPC Building,  
GTU Innovation Council (S4-CiC3),  
LDCE Complex, 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 an innovative - strong 6-semester spine of Design Engineering in the BE syllabi. It is a first of its kind initiation in Indian Education System. Since April 2013, GTU's Centre for Industrial Design (OPEN DESIGN SCHOOL) has conducted a series of seminars/workshops/ FDPs to sensitize the design driven innovation intervention. It has also created a framework for the final year projects. For Design Engineering at semester 3, 9 Faculty Development programs (FDP) were organized in the months of August to November, 2014. In all, 650 faculty members have participated in the FDPs for Design Thinking methodology from approx. 115 Engineering colleges and from 20 different engineering disciplines from throughout Gujarat state.

After the success of the FDPs for Design Engineering – 1A during the last semester, GTU - Design Team has planned a series of three days FDPs from 16<sup>th</sup> February, 2015 to 11<sup>th</sup> March, 2015 through 10<sup>th</sup> – 14<sup>th</sup> Faculty Development Programs (FDP) for 4<sup>th</sup> semester. These FDPs were organized to help all to channelize the guidelines and flow for the semester. The aim of the FDPs was to give guidelines for 4<sup>th</sup> semester students for Design Engineering – 1B subject after various brainstorming and discussion sessions.

**Schedule/ Activity Information of the Program:**

Day 1			
Session No.	Time	About	Description
10.00 am – 10.30 am		Registration and Breakfast	
1	10.30 am – 11.00 am	<b>Introduction &amp; Orientation</b>	Syllabus and Guidelines for 4 <sup>th</sup> semester
2	11.00 am – 1.30 pm	<b>Case Study Analysis</b>	Teams need to analyze case studies and find out impact of Design Thinking on cases mentioned in it
1.30 pm – 2.00 pm		Lunch Break	
3	2.00 pm – 3.00 pm	<b>Design Thinking –An Industrial Impact</b>	How Design Thinking affects in Industrial Product Design/Development Process
4	3.00 pm – 5.00 pm	<b>Preparation of PD canvas</b>	Newly formed teams shall select a <b>branch specific problem</b> and prepare a Product development canvas concept and get it validated quickly

Day 2			
10.00 am – 10.30 am		Breakfast	
5	10.30 am – 1.30 pm (Field Work)	<b>AEIOU Framework</b>	Observation tool for getting insights of user by faculties in field – it will be individual/team exercise for each faculty around venue to validate their PDC concept
1.30 pm – 2.00 pm		Lunch Break	
6	2.00 pm – 5.00 pm	<b>Summarization and Pre-Design</b>	<b>Summarize on interview responses and work out Details/ specifications of identified components</b> (Size, shape, cost, availability in market, variations/ versions, materials, application methods and so on)

Day 3			
10.00 am – 10.30 am		Breakfast	
7	10.30 am – 12.00 pm	<b>Learning Needs Matrix</b>	With understanding of basic branch related subjects (empathy on a BE II student), by the end of Sem. IV, students shall be able to <b>identify tools/ use of software/ applicable standards/ material strengths/ design specifications/ theories/ principles/ methods/ experiments</b> needed and by the end of Sem. IV they may start searching basics of it and begin learning
8	12.00 pm - 1.30 pm	<b>Prior Art search</b>	Each faculty shall search at least 2 most relevant research papers on their PD concept – May be referring journals or patent database
1.30 pm – 2.00 pm		Lunch Break	

9	2.00 pm – 4.30 pm	<b>Dirty Mock ups (Fast Prototype)</b>	One shall prepare schematic plan/ prototype (conceptual/ rough/ broadly anticipated only). It shall elaborate on details on anticipated working patterns/ mechanisms. (This is to address the <b>PROOF OF CONCEPT</b> criteria)
10	4.30 pm – 5.00 pm	<b>Feedback &amp; Certificate Distribution</b>	

**List of Program Mentors:**

Sr. No.	Name of the Mentor	Institute/ Organization
1.	Prof. Bhasker Bhatt	Assistant Professor, SCET, Surat
2.	Mr. Ashok Gupta	CEO (Residence), GTU, Ahmedabad
3.	Ms. Devina Kothari	Industrial Design Innovation Specialist, Mizu Ha, School of Architecture, Rajkot
4.	Prof. Rajvi Parikh	Assistant Professor, GCET, VV Nagar
5.	Prof. Dhaval Patel	Assistant Professor, GIT, Ahmedabad
6.	Prof. Karmjitsinh Bihola	Assistant Professor, Design Engineering Team, GTU

**Day 1: 10.30 AM onwards**

The day started with eagerness among the participants regarding 4<sup>th</sup> semester syllabus and guidelines for Design Engineering – 1B subject. Participants were divided into branch specific teams. *Prof. Karmjitsinh Bihola – GTU Design Team* has discussed the syllabus and guidelines for 4<sup>th</sup> semester in first session. *Mr. Ashok Gupta – CEO (Residence), GTU and Prof. Jaimin Dave-A.P., GTU,* talked over different case studies based on Design Thinking and then participants were given exercise to analyse more case studies from given Workshop tool kit on their own and also presented their thoughts about Design Thinking process implemented in those case studies.

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

creative and innovative solutions out of it. Also she cleared participants' mind with messy thoughts related to Impact of Design Thinking in Industrial products.

*Prof. Bhasker Bhatt (A.P.-SCET, Surat)*, 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 same platform. After this small brainstorming session, he asked newly formed teams to prepare their Product Development canvas and get validated the same quickly.

### **Day 2: 10.30 AM onwards**

Second day started with discussion on the idea of teams that they have prepared through Product Development canvas on Day-1. Prof. Bhasker Bhatt and Prof. Karmjitsinh explained AEIOU technique of observation for Design Thinking with the help of Observation Record Sheets which were prepared to help students while they are on field to record their observation. Participants were more curious about this new technique as it is simple hence very useful.

After explanation of Interviewing Techniques, participants were sent on field 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 idea. As they came back from field work summarization and small presentation session was held to share their experience with real users.

### **Day 3: 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 explained Learning Needs Matrix as a part of 4th semester Design Engineering – 1B curriculum. This matrix helps students to identify their branch specific skillsets like theories/ principles/ methods/ tools/ experiments/ use of software/ applicable standards/ design specifications which are not in syllabus of Engineering. These skillsets are useful to students to complete their projects/products with specific competency level.

*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, *Mr. Hiranmay Mahanta – Honorary Director, GTU Innovation Council* 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.

During the various FDPs *Dr. Akshai Aggrawal (Honourable VC – GTU)* guided all participants with his visionary thoughts about the subject and future curriculum. He discussed on final guidelines for 4<sup>th</sup> semester students for Design Engineering – 1B subject and policy points for making the subject more sustainable in all the affiliated colleges. He suggested that the Faculty Members should guide students for adopting *Branch Specific projects, should invite designers from various industries to the class-rooms* and to study the literature available on the web-site and from books and journals to improve the learning processes at every College.

## Photographs

**10<sup>th</sup> FDP: 16<sup>th</sup> – 18<sup>th</sup> February, 2015**



Mentors interacting with Participants during sessions

*Post-graduate Research Centre for Industrial Design*

**OPEN DESIGN SCHOOL**



Participants involved in Canvas filling activity



Hon.ble VC-GTU, Dr. Akshai Aggarwal Sir and Mr. Hiranmay Mahanta interacting with Participants during FDP

*Post-graduate Research Centre for Industrial Design*

**OPEN DESIGN SCHOOL**

11<sup>th</sup> FDP: 20<sup>th</sup> – 22<sup>nd</sup> February, 2015



Mentors with presenting thoughts during sessions

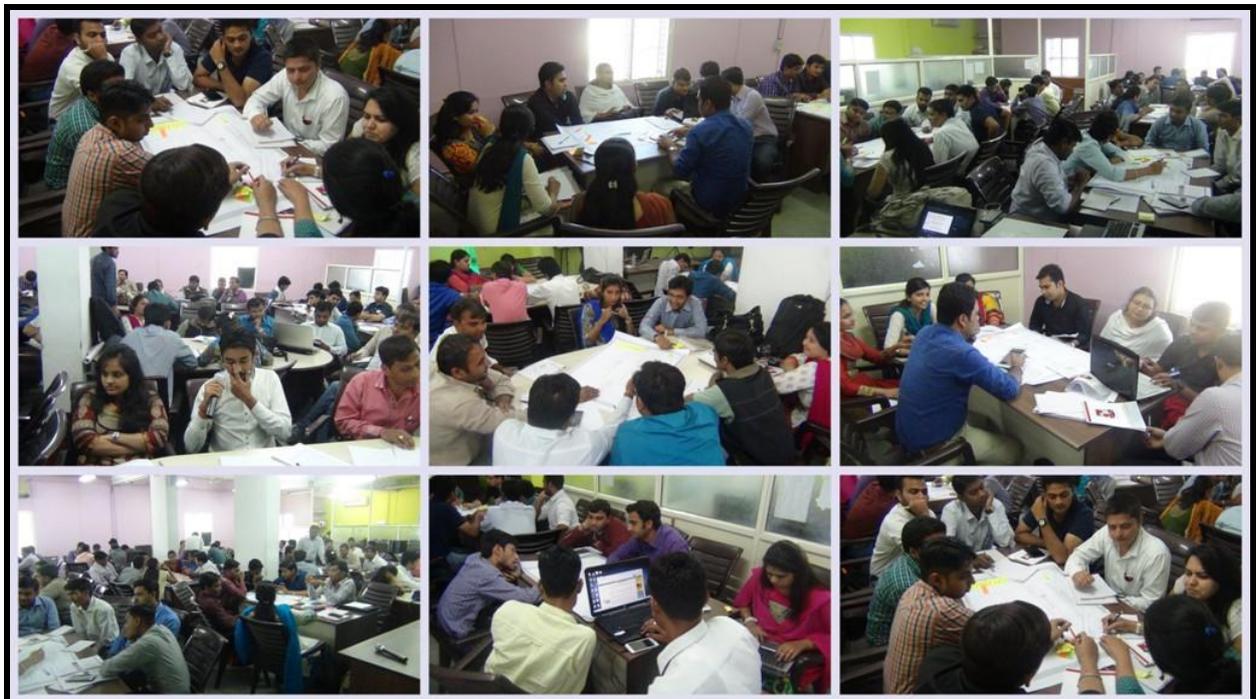


Participant Audience during the Program

12<sup>th</sup> FDP: 26<sup>th</sup> – 28<sup>th</sup> February, 2015



Mentors giving presentation and interacting with Participants during sessions



Participants involved in Canvas filling activity and discussion session during FDP

*Post-graduate Research Centre for Industrial Design*

**OPEN DESIGN SCHOOL**



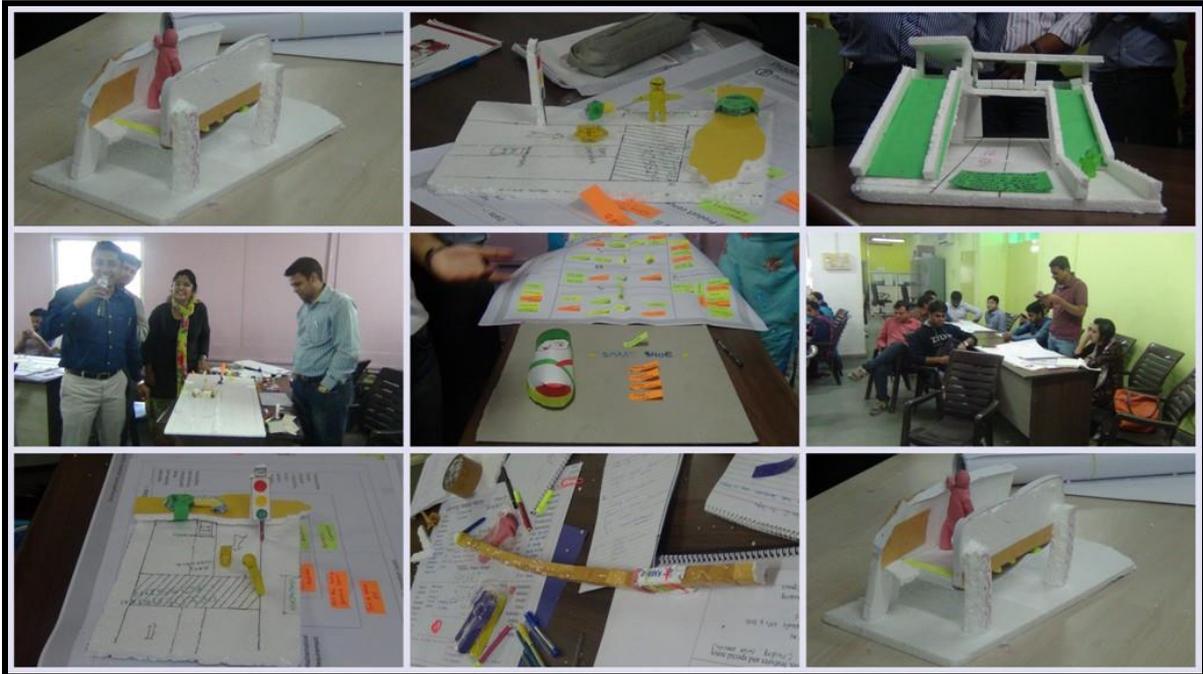
Hon.ble VC of GTU, Dr. Akshai Aggarwal Sir interacting with Faculty Participants

**13<sup>th</sup> FDP: 2<sup>nd</sup>–4<sup>th</sup> March, 2015**



Design Engineering Team-GTU giving presentation and interacting with Participants during sessions

**Fast Prototype Session**



Faculty Participants displaying Rough Prototype prepared during FDP



Mr. Hiranmay Mahanta, Mr. Ashok Gupta and Prof. K.A. Bihola interacting with Participants during concluding session of FDP

*Post-graduate Research Centre for Industrial Design*

**OPEN DESIGN SCHOOL**

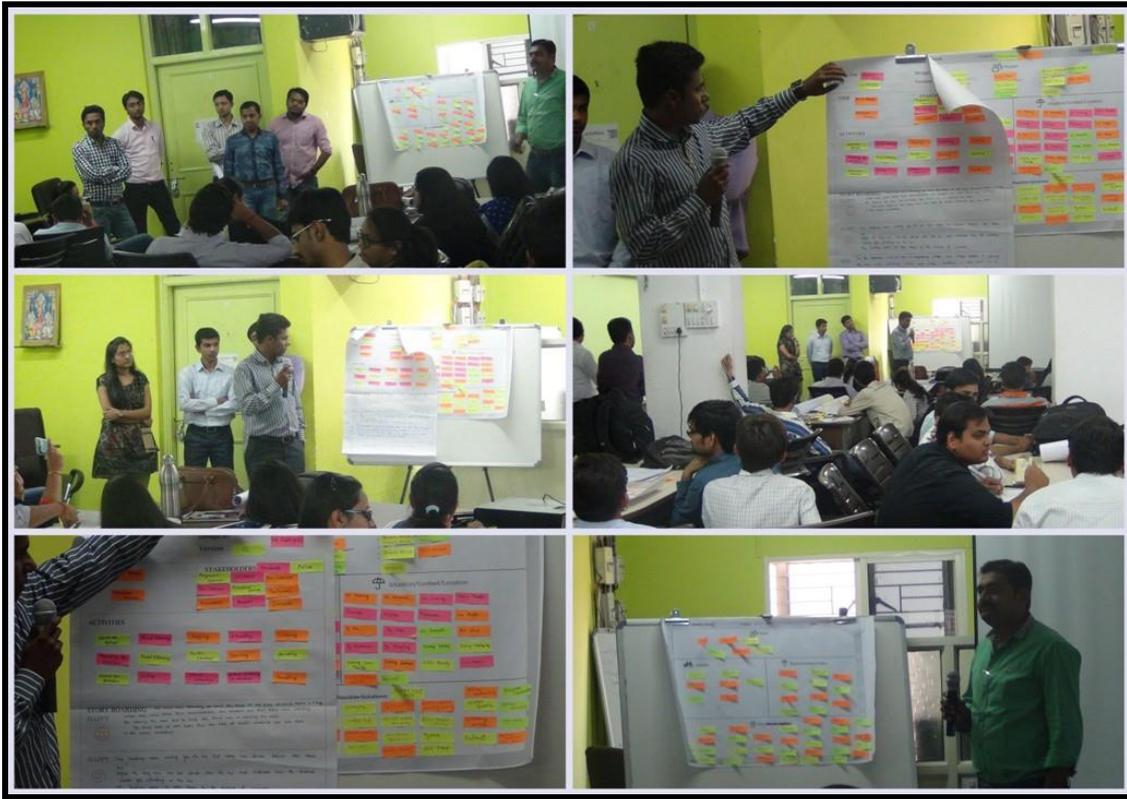


Faculty Participants receiving Certificate during concluding ceremony of FDP

**14<sup>th</sup> FDP: 9<sup>th</sup> – 11<sup>th</sup> March, 2015**



Prof. K.A. Bihola-Design Engineering Team, GTU giving presentation and interacting with Participants



Canvas filling activity and team wise presentation



Preparation of Fast Prototype



Faculty Participants sharing views and receiving Certificate during concluding ceremony of FDP

### **Feedbacks from participants:**

To get the participants' feedback, we divided FDP experiences on below mentioned points. In nutshell, all faculty members have given very significant and effective feedbacks.

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

- ✓ My purpose is 1) what is design engineering? 2) How to follow this procedure to convert thought in to a real working model.

Chiragkumar Ashokbhai Chodavadiya  
S.N. Patel Institute of Technology & Research Centre, Umrakh

- ✓ As I am course coordinator of design engineering in our college, I would like to keep updating myself. Also I am interesting in finding new techniques and project ideas.

Mayank C. Kapadiya  
Gandhinagar Institute of Technology

- ✓ I wanted to learn about the design engineering so as to make the students aware about the subject, the process of design. This would help the students to work towards the things which they really want to make with the help of engineering.

Rahul Ranjan  
Neotech Institute of Technology

- ✓ Convener GTU Innovation Sankul, V.V. Nagar Zone 2 Design Engineering at 4<sup>th</sup> semester B.E. the students must informed about subject, details contents, procedure steps, model making etc. As it is the part of curriculum what is expected from the students, to get the clarity.

J N Jain  
Birla Vishvakarma Mahavidyala

- ✓ My main purpose of engineering to enter into design world and to bring innovation in engineering field. I don't want just that student should be theoretical strong but practically strong and that comes from just thinking in new way.

Kshatriya Krishnakumar V  
Amiraj College of Engineering and Technology

- ✓ Design thinking is a learning curve wanted to learn and explore which I have not learned during my collage days after 1a I felt the urge to learn further Also subject is great way to make bond and tender young engineers mind

Keyur V. Nagecha  
V.V.P. Engineering College

- ✓ To learn the methods associated with design based thinking and become capable to transfer this knowledge to the students so that they can implement design based engineering for their projects and thus become more employable.

Jatin R. Ambasana  
B. H. Gardi College of Engineering and Technology

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

- ✓ All the discussions were great & team members have satisfied our questionnaires successfully. It was better than first FDP. Only one thing I expect that you arrange this FDP at zone level & also for students.

Payal V. Shah  
Vidhyadeep institute of management & Technology

- ✓ I thought in this FDP also have a canvas as last semester But there are very interesting things I have learn This FDP change my concept about prototype, this is very easy and interesting.

Ruchee Sharma  
K J Institute of Engineering and Technology

- ✓ It was as per the expectations. The expert (Ms. Devina Kothari) who herself had gone through the whole process has explained the process well. Due to that, we got the live demonstration for students as case study. Also, we can encourage girl students to pursue entrepreneurship like she did. Such examples are good.

Amit Hemantlal Rathod  
Parul Institute of Engineering & Technology

- ✓ It was good all over. The session by Balakrishnan was very helpful. The key processes of design, evaluation, interaction and AEIOU model of approach was fabulous. Meanwhile, the last day when we were on fields, we learnt about many things like red traffic scenario, about the expectations of people in design. It helped us to generate the ideas regarding our design. It was amazing.

Rahul Ranjan  
Neotech Institute of Technology

- ✓ After achieving humungous feedbacks from the Students side on the Design Engineering 1A, I expected something new and mind boggling in the Design Engineering 1B. The good part is, it did meet my expectations. The FDP of Design Engineering 1B was very innovative and the insights on the concept of AEIOU framework did the amaze. I also was able to better understand the reason why OBSERVATION was necessary prior to IMAGINATION.

Parth S. Shah  
Takshashila College of Engineering & Technology

- ✓ My expectations were as such to know the root of Design Engineering. The entire workshop was much more above than what I have thought about. It not only helped to understand the concept of Design Engineering, but rather it helped me to approach any problem in an entirely different style. Design Engineering, I thought was just limited to Engineering, but after this workshop; it's very clear that this "Design Thinking" can be applied to any aspect of life.

Sudeep S. Kolhar  
LJIT, Ahmedabad

- ✓ It is nice workshop which gives lot's thing about idea generation through AEIOU frame work field observation. FDP was well organised by day schedule and sequence understand about ideation canvas, PDC and need matrix etc. Through this FDP, i was depth of DE subject what real concept behind GIC wants.

Prof. Dhavalkumar Punamchand Patel  
Gandhinagar Institute of Technology

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

- ✓ Basically before attending FDP was confused where to go in search for this subject but after attending FDP the path is totally cleared and I hope will be able to deliver it to the students.

Milan Patel

Marwadi Education foundation Group of institutions

- ✓ Obviously it influences in very positive way. The way this subject and concept is designed is very amazing and fruitful to students as well as faculties.

Parth V. Milan Patel Parekh

Hasmukh Goswami College of Engineering

- ✓ FDP part 2 was much innovative and more practical based rather than relying on theory, so teaching pedagogy is shifted towards the methods which leads students to take much more interest in subject.

Harsh Thakkar

Sal College of Engineering

- ✓ My learning pedagogy was influenced, to a great extent. I am basically a Design Engineer in the field of Mechanical Engineering. But, this new concept that has been introduced by Tim Brown (in relation to the video) i.e. the Design Thinking has drastically changed my thinking pattern and thus my learning pedagogy.

Sudeep S. Kolhar

LJIT, Ahmedabad

- ✓ This was a completely new experience and the way, in which the mentors explained to us the entire process; it was very informative and very interactive. It made us understand whole procedure for sem 3 & sem 4 that how to guide the student, what to do in the sem 3rd & 4th Design engineering is completely opposite of what we had thought. Innovation through Ideation Canvas is very helpful for Industry as well as development of student and turn the thinking towards the real life problem and solve it effectively.

Hardik N. Chauhan

Atmiya Institute of Technology & Science, Rajkot

**Key learning points from FDP:**

AEIOU technique helps for finding empathy of the user. Learning Need Matrix is again a novel concept for me.

Prof. N. D. Mehta

Vishwakarma Government Engineering College, Chandkheda

To stay focused, To keep words / instructions simple. Proper understanding of words/ terminology, To find & inform local examples for understanding, Design thinking is about doing & not only thinking, Its improving insight & observation technique, Information on Crowd Funding, Branch specific, material science & to co-relate to standardization.

Dinesh A Patel

Shri S'ad Vidya Mandal Institute of Technology, Bharuch

Interaction / Survey before going through a process / actual implementation of design. We should ask the user about his expectations from the product, and on this basis a prototype should be made to influence the market. Observations in the real world scenario considering the flaws in previous design: While writing this , I am still thinking about the Zebra Crossing Scene, where it converges towards the Divider and the persons using that were not able to cross it . It was a flaw!!! And while designing a new thing, we must consider these aspects.

Rahul Ranjan  
Neotech Institute of Technology

The basic and the most important point that I learnt is to Observe. Because without observation, I am just a layman who does not understand the core need of the hour. Also, the workshop taught me to empathize with my user and it taught me to interact with them, thereby coming with new and unexpected solutions.

Sudeep S. Kolhar  
LJIT, Ahmedabad

AEIOU, Real Observation of field or real problem of society, To generate idea or problem identification, How to make product development canvas through AEIOU and ideation canvas, Make prototype model to justifying end user application, Policy of BE 2 ,3,4 Year design need matrix with respect to basic stages- I,II,III which containing basic tool required, basic principal apply, basic need customer etc.

Prof. Dhavalkumar Punamchand Patel  
Gandhinagar Institute of Technology

After attending the workshop I keep on thinking what is lacking in current solutions, what are the untapped areas that can be worked upon. This will help me to give directions to students about how to find problems based on "Empathy"..If the problems that have highest empathy get some solution then it will definitely highest impact on society.

Shweta Y. Yagnik  
L.J. Institute of Engineering and Technology

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

- ✓ ya i am probably going to arrange workshop on Saturday, 21st February for students of 4th semester all branches at my college level as a team work sitting on table & chairs like same environment at GTU. At that time students will also go for survey with faculty also.

Payal V. Shah  
Vidhyadeep Institute of Management & Technology

- ✓ No more vague work. The work of DE will also increase the interest of students in their other parallel subjects, provided they enjoy the DE. The present text book oriented learning of engineering subjects will be supplemented by extra searching & learning.

Dinesh A Patel

Shri S'ad Vidya Mandal Institute of Technology, Bharuch

- ✓ In class lectures/ field work on design, I would be incorporating the methodologies I learnt during the FDP programme. I am thinking that the students should go to villages, and work on the real time problems which is faced by our citizens. This could help the students to learn some real time problems and also help to develop our villages, state through the implementation of engineering. Now, I would recommend the students to do more and more interaction and detailed analysis of the problems which is faced. They can make something out of their minds, and write down the numerous ideas which they are getting to implement the solution of the problems. Then, our team would be checking the feasibility of the solutions which can be implemented. So, in this way we might get something which can be really helpful to our society as well as students.

Rahul Ranjan

Neotech Institute of Technology

- ✓ I can guide now student how to find the problem using "Design Thinking" process, what is the importance of empathy mapping. Before attending workshop, sheets are only piece of paper with empty spaces that has to be filled up somehow....but now I actually understand the importance of each and every section. So with my improvement I will definitely make my lectures in such a way that my students will also get motivated to do something out of the box.

Shweta Y. Yagnik

L.J. Institute of Engineering and Technology

#### **Thought on improvement of FDP sessions:**

- ✓ If more people from industry / innovation can come and share their experience about how they transformed an idea to a product, it would really be helpful. For the framework AEIOU, there is already a formal method available for IT/CSE branch which is Object Oriented Analysis and Design. Hence, if further work can be done as per the branch, it will be better for the students to understand and relate to.

Amit Hemantlal Rathod

Parul Institute of Engineering & Technology

- ✓ Zone Wise FDP Programmes: I think to attend the FDPs most the persons have to travel so much distance. So, we may create a system for zone wise FDPs programmes. Implementation of Online Technologies during FDPs: There are many persons who want to attend FDPs, but due to some constraints they might not be able to come to the FDPs. So, if a system could be developed where we can also upload the FDP sessions on YouTube / online media streaming websites OR

we could provide a live Google Hangout Sessions for the FDP programmes, it could attract more no of teachers in the FDP programmes.

Rahul Ranjan  
Neotech Institute of Technology

- ✓ Instead of merging all the branches of the engineering at the same time FDP, if there was branch wise separate FDP and specific branch expert give the understanding of design procedure of this semester with technical case study rather than out of the course. Main suggestion about FDP must have to do for branch wise separately. Than every faculty will share their knowledge and their experience better than this one.

Dixit N Patel  
Parul Institute of Technology

- ✓ Session should start before the semester beginning. Say in May-June for Next semester course, so that Faculties can also get some time to prepare their case studies thoroughly and thus better guide the students. Real Life Case Studies (As presented by Ms. Devina about the Cornea KIT she developed) need to be given more time. Instead of Theory/Group Session, Session from actual experts should be done in the beginning as these only opens up the mind to new ventures.

Bhavesh Jaiswal  
Shakersinh Vaghela Babu Institute of Technology Gandhinagar

**Your experience before and after attending FDP in relation with Design Engineering:**

- ✓ After attending this FDP I strongly agree that DE will effectively help students to developed their skills and grow up with more innovative ideas.

Nidhi B. Gondalia  
Noble Group of Institutions, Junagadh

- ✓ Before attending the workshop, I didn't understand the purpose of design engineering but after attending the FDP, I will be understand the design engineering and able to guide student.

Maulik A. Patel  
Gujarat Power Engineering and Research Institute

- ✓ It is amazing experience for me. I never expect that this FDP would be like this. I learnt, I enjoyed. Thankful to the team who organised and run this FDP smoothly.

Parth V. Parekh  
Hasmukh Goswami College of Engineering

*Post-graduate Research Centre for Industrial Design*

**OPEN DESIGN SCHOOL**

- ✓ Having attended the FDP for 1A my expectations were very much high, and was happy that the content taught did meet the expectations.

Parth S. Shah

Takshashila College of Engineering & Technology

**What sessions have you found that need to give more/less time?**

- ✓ Observation and ideation canvas will require more time compare to all.

Amit Rameshbhai Patel  
Gandhinagar Inst of Tech

- ✓ Give more time to Prototype Making

Hardik N. Chauhan  
Atmiya Institute of Technology & Science, Rajkot

- ✓ The session for redesign must be given some more time so that we can talk about our proposed solution with the actual users.

Sonali Ankit Virparia  
Gandhinagar Institute of Technology

*Report Compiled by:*

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