Ref: GTU/GIC/DIC/Event Report/2022/ **Date: / /2022**

Report On
Design Bootcamp 2022
Organized by
Design Innovation Centre (DIC)

Date: 30th May – 3rd June 2022
Mode: Offline, Aryabhatta Hall, GSET
Total registrations: 110
Time: 11:00 AM to 5:00 PM (6 Hrs.)
Subject Expert(s): 1. Mr. Karamjitsinh Bihola – Founder Innodesk
2. Ms. Vidhi Bhavsar, Design Thinker for Academics and Research
3. Mr. Meet Patel, LevelUp Team
4. Mr. Jayesh Mahitkar, Founder and Director, MahitX Technologies
5. Mr. Dhruv Saidava

Gujarat Technological University (GTU) has started the process of bringing the excitement of learning into the laboratories, classrooms, and workshops from its foundation in 2007 focusing on Practical Based Learning (PBL). Besides other initiatives, one strand in the process is to imbue the whole of the learning process, during the undergraduate studies, with design orientation.

Gujarat Technological University (GTU) organized a five day Design Bootcamp from 30th May 2022 to 3rd June 2022, on Creativity and Innovation using Design Thinking approach, with all fun filled hands-on exercises and games so that kids who were participated in this bootcamp can learn the very important aspects of such skills and mindset easily. This bootcamp was supported by Design Innovation Centre (DIC – Hub) of GTU, and was exclusively designed for School Children from std. 8-12 of Gujarat State. Total 35 school students from different schools of Ahmedabad had participated in the Design Bootcamp 2022.

Objective: Globally practiced Design Thinking ideology and design/practical based learning approach were the core at the bootcamp. During the bootcamp, participants got the opportunity to explore Creative Thinking, Innovation Process, Sketching, Problem Solving, Tinkering and Material Exploration through various sessions conducted by Experts in Design, Innovation, and Technology – all with Fun Learning through games and Hand-on exercises. They have also learnt the emerging technologies like Scratch Programming, 3D printing, Integration of Electronics parts like Arduino, Sensors, Drives etc., Reverse Engineering.

Inaugural function

"Fostering the right environment can train the students to become problem solvers"
-Er. Niraj Shah, Mentor, Academician and Entrepreneur

Dr. S K Hadia, DIC Coordinator, GTU welcomed all the kids to the Bootcamp at GTU and appreciated them for participating in the Bootcamp even during the vacation period. He encouraged the participants to use this opportunity at its full potential and motivated them to think big - think different to innovate things differently.

The chief guest of the inaugural, **Er. Niraj Shah**, an Innovator, Mentor & Entrepreneur encouraged participants by triggering them to think about innovations in the surroundings. He explained how a single robotic arm has 43 motors to support the efficient working of a hand. He emphasized that innovation is everywhere, we just need a mentor to enable us to find it. He said everyone can become a problem solver and DIC-GTU has framed the right part for students to cultivate design thinking and innovation in the initial formative years.

Prof. (Dr.) Navin Sheth, Hon. Vice-Chancellor, GTU has motivated the students by saying that Design does not depend on language, ideas popping into young minds should be expressed and constantly worked upon to nurture. By sharing the stories of a 12-year-old boy, Varun Saikia, who made a machine to clean out the water bodies. Dr. Sheth motivated students that every individual is born a genius hence his creativity can be nurtured with the proper environment, processes, and with the tools, and Design Innovation Centre is working towards it.

Creativity and Innovation don't rely on Language or Age
-Prof. (Dr.) Navin Sheth, Hon. Vice-Chancellor, GTU

Prof. Raj Hakani, DIC Coordinator gave the vote of thanks, thanking the parents to allow their children to attend the 5 day Bootcamp and giving the students a chance to learn. He also extended gratitude to the dignitaries present on dias for allowing the DIC team to arrange the extensive event and helping in each way possible.

Figure 1 Glimpses of the Inaugural function

Figure 2 Participants of the Design Bootcamp 2022

Day 1: Ice Breaking Session: Design Thinking

Orientation: Introduction to Design Thinking and AEIOU of Observation
Design Thinking: Why, What, How (Characteristics, Process, Tools)
Experts: 1. Mr. Karamjitsinh Bihola
2. Ms. Vidhi Bhavsar

Innovation can be defined simply as a "new idea, device or method". However, innovation is often also viewed as the application of better solutions that meet new requirements, needs, or existing market needs. The term "innovation" can be defined as something original and more effective and, as a consequence, new, that "breaks into" the market or society. It is related to, but not the same as, invention, as innovation is more apt to involve the practical implementation of an invention (i.e. new/improved ability) to make a meaningful impact in the market or society.

Mr. Karamjitsinh Bihola, Founder of Innodesk Designovation Services started the session by elaborating on the WHY? WHAT? And HOW? Innovation is important. The session started with how to make observations, conduct research, and apply their acquired knowledge and skills, so students could confidently take on real-life problems and create sustainable solutions. In this process, students were able to identify their own passion and potential, and even gained knowledge about basic design thinking and creativity. He enabled the students to make observations around themselves and turn the problems around them into ideas and opportunities.

In the second session, the students were thought about Observation and how it plays the most crucial part in the path of design thinking. Kids were guided to prepare the empathy map for the user in the context of the Garbage Management domain. Kids learned very crucial and important aspects of design research, **AEIOU of Observation** which helped them understand the problem better and the approach towards problem-solving. This was thought by an experiment of understanding the surroundings, interviewing the related people, and noting down it in the empathy map.

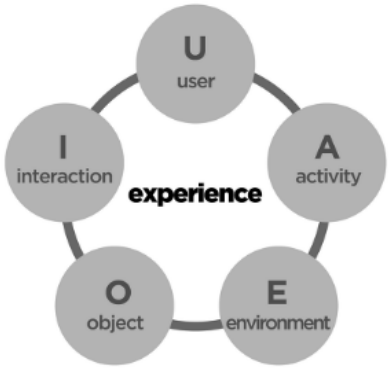

Figure 3 AEIOU Framework for contextual research

Figure 4 Glimpses of Day 1 - Introduction to Design Thinking

Day 2: Design Thinking (Ideation, Strategic Approach towards Innovation)

Design Thinking: Ideation Canvas, Identifying a problem, bridging the gap, and prototype building considering all possibilities.
Experts: Mr. Karamjitsinh Bihola
Ms. Vidhi Bhavsar

On the 2nd day, a discussion about the experience of the first day was begun and queries of the students were solved by the Design Team. After discussion, all the teams were set for observation on the Garbage domain. They were informed on how to and what to observe- with lots of notes, photographs, videos, interviews, and so on.

After the observation, all teams were guided for Mind Mapping – A graphical visualization technique by Mentor, Karmjitsinh Bihola. Mind Mapping is the visual representation technique that includes a central idea surrounded by connected branches of associated topics to better organize the messy and unorganized data. It helps to better organize, understand, communicate and recall the topics.

Then Empathy Mapping Canvas was explained by the mentor; Empathy Map helps to understand and identify the emotional and unmet needs of the user. The observation and Empathy process is the foundation of any Design Thinking project and one must spend enough amount of time for this phase by doing observation and interaction again and again. Then the students were divided into groups and were explained how each member of the group is to be given different task and about efficient working of the group. They were also explained about basic prototype building to support their solutions and how PoCs are an integral part in the process.

Figure 5 Participants divided into team for prototype building

Figure 6 Prototype building for demonstrating the identified solution.

Figure 7 Teams demonstrating their prototypes to the expert for feedback

Day 3: Basics of Scratch Programming

Scratch Programming: Fun games, design and codes through scratch programming
Experts: 1. Mr. Meet Patel

Innovation is doing something new that adds value to existing products, processes, or services. Mr. Meet Patel thought that using Scratch allows young people to understand the logic of programming and how to creatively build and collaborate. Scratch is a high-level block-based visual programming language and website aimed primarily at children as an educational tool for programming, with a target audience of ages 8 to 16. The Scratch interface is divided into three main sections: a *stage area*, *block palette*, and a coding area to place and arrange the blocks into scripts that can be run by pressing the green flag or clicking on the code itself. Users may also create their own code blocks and they will appear in "My Blocks". Scratch is used as the introductory language because the creation of interesting programs is relatively easy, and skills learned can be applied to other programming languages.

Scratch is not exclusively for creating games. With the provided visuals, programmers can create animations, text, stories, music, and more. There are already many programs that students can use to learn topics in math, history, and even photography. Scratch allows students to create conceptual and visual stories. Using Scratch allows young people to understand the logic of programming and how to creatively build and collaborate.

Figure 8 Introduction to Scratch Programming

Figure 9 Hands-on exercises on Scratch Programming by making designs, games and animal dance parties

Day 4: Basics of Electronics

Electronics components, basic coding, loops and sensors

Experts: 1. Mr. Meet Patel

The day started with Mr. Meet Patel giving a brief introduction about electronics different components and electronics plays an important role in automation. For automation, logic is important and the session started with that only. An overview of block coding was given and references from scratch programming was used. After logic building, the students were thought hands-on experiments using LED and different electronics components.

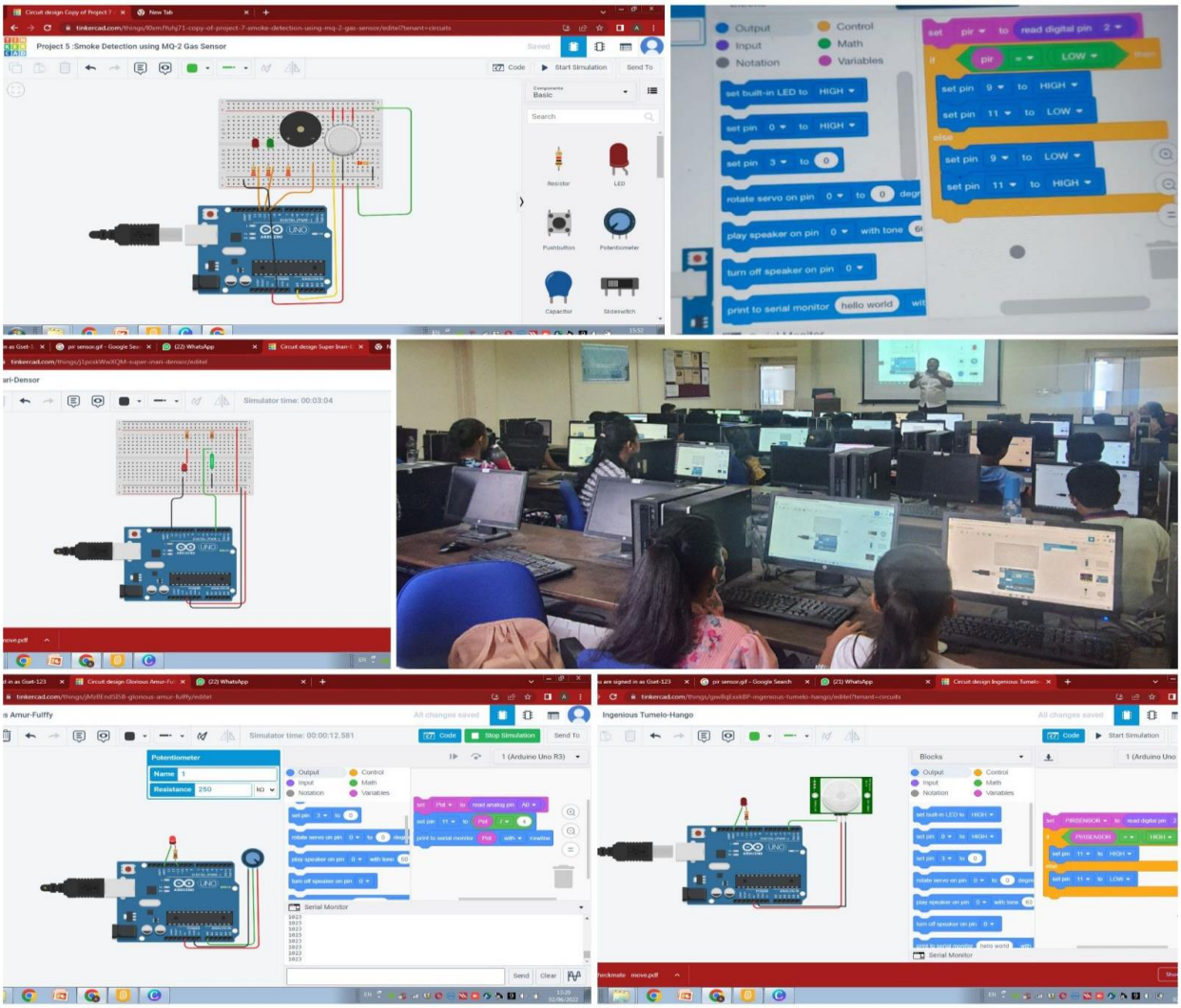

Figure 10 Practical session on interfacing different electronics components with Arduino

The second session started with introduction to sensors and actuators. Then students were explained about different sensors, their practical implication and how to interface them with Arduino. They were also introduced to Arduino coding and how to get the real time readings in the serial monitor. Also, a brief overview of loops, conditional programming was given.

Later on, the participants were shown real time hardware implication of Automatic door opening using an Ultrasonic sensor and servo motor interfaced with Arduino. All the participants were given demonstration for the same.

Figure 11 Demonstration of automatic door system

Day 5: 3D Printing and Modelling

3D Printing and visualization on the Maker Bot.
Expert: Mr. Jayesh Mahitkar
Mr. Dhruv Saidava

3D printing, also known as additive manufacturing, is a method of creating a three dimensional object layer-by-layer using a computer created design**.** 3D printing is an additive process whereby layers of material are built up to create a 3D part. Mr. Jayesh Mahitkar explained the students that here are so many uses for 3D printing in today's world, and you can get in on the action.

When it comes to kids coding activities, there are a lot of options for screen-based activities. Finding a good balance between unplugged coding activities and screen-based activities is always a goal of mine.3D printing has become a big deal in the last few years, and can help reinforce some of the concepts coding games are helping kids learn. The process is fairly simple; **design and print**.

Figure 12 Introduction to 3D Printing and modelling

Students were then briefed about 3D Modelling and conceptualizing designs. They were shown 3D modelling softwares and were thought basic modelling tips. This session further a involved a visit at the Design Innovation Centre, where they participants visualised 3D printers and live 3d printing. Mr. Dhruv Saidava explained the students about the printer and what are the things to be kept in mind when using a 3d printer.

Figure 13 Participants learned about 3D Printers and visualizing designs

Valedictory function

After the training of 5 days the Bootcamp was concluded and the valedictory ceremony was organized. The parents of the children were invited. The function started with sharing experiences and feedback about the Bootcamp followed by showing a video which had glimpses of the Bootcamp.

Preceded by certificate distribution and the participants were given a token of appreciation in the form of 3D printed Mangalyaan provided by MahitX Technologies Pvt. Ltd., DIC printed Mugs, 3D printed key chains, and pens including sanitizer.

Figure 14 Students were appreciated by giving 3D printed Mangalyaan.

Media Coverage

08 June 2022, Wednesday
વલસાડ કેસરી

જીટીયુ ખાતે યોજાયેલ ડિઝાઈન બૂટ કેમ્પમાં 7 થી 17 વર્ષના 100થી વધુ વિદ્યાર્થીઓએ ભાગ લિધો

મશીન લર્નિંગ , આર્ટીફિશિયલ ઈન્ટેલિજન્સ , ડિઝાઈન થિંકિંગ આવનારા ટેક્નોલોજીકલ ભવિષ્યની જરૂરીયાત છે. વિદ્યાર્થીઓ શાળાકીય અભ્યાસ દરમિયાન જ આ વિષયોથી અવગત થાય તે આવશ્યક છે - પ્રો. ડૉ. નવીન શેઠ - કુલપતિ, જીટીયુ

એર પોલ્યુશન મોનીટરીંગ સિસ્ટમ , સિક્યોરીટી સિસ્ટમ, ગેમ અને લોજીક ડેવલોપમેન્ટ , ૩-ડી પ્રિન્ટીંગ જેવા વિષય પર વિદ્યાર્થીઓ દ્વારા પ્રોજેક્ટ રજૂ કરવામાં આવ્યાં.

અમદાવાદ । સોમવાર, શાળાકીય અભ્યાસ દરમિયાન જ ટેક્નોલોજી પ્રત્યે વિદ્યાર્થીઓ પ્રેરાય અને ડિઝાઈન , ઈનોવેશન જેવી પ્રવૃત્તિમાં ભાગ લે તે અર્થે દર વર્ષે રાજ્યની સૌથી મોટી ટેકનોલોજીકલ યુનિવર્સિટી તરીકે નામના મેળવનાર ગુજરાત ટેક્નોલોજીકલ યુનિવર્સિટી (જીટીયુ) દ્વારા ડિઝાઈન બૂટ કેમ્પનું આયોજન કરવામાં આવે છે. 5 દિવસીય ડિઝાઈન બૂટ કેમ્પમાં 100થી વધુ વિદ્યાર્થીઓએ ભાગ લિધો હતો . આ સંદર્ભે જીટીયુના કુલપતિ પ્રો. ડૉ. નવીન શેઠે જણાવ્યું હતુ કે, મશીન લર્નિંગ , આર્ટીફિશિયલ ઈન્ટેલિજન્સ , ડિઝાઈન થિંકિંગ આવનારા ટેક્નોલોજીકલ ભવિષ્યની જરૂરીયાત છે. વિદ્યાર્થીઓ શાળાકીય અભ્યાસ દરમિયાન જ આ વિષયોથી અવગત થાય તે આવશ્યક છે. જીટીયુના કુલસચીવ ડૉ. કે. એન. ખેરે ડિઆઈસી ઈન્ચાર્જ ડૉ એસ. કે. હડિયા અને કો ઓર્ડિનેટર પ્રો. રાજ હકાણીને સફળ સંચાલન બદલ અભિનંદન પાઠવ્યા હતાં.

રાજ્યભરની વિવિધ સ્કૂલોના 7 વર્ષથી લઈને 17 વર્ષના વિદ્યાર્થીઓએ બૂટ કેમ્પમાં ભાગ લિધો હતો . જેમાં યુવા ટેકનોક્રેટ દ્વારા વિચારો અને તેમની આવડતથી સમાજની વિવિધ સમસ્યાઓનું ટેક્નોલોજી અને ઈનોવેશનની ડિઝાઈનનું નિર્માણ કરીને સમાધાન મેળવવા માટે પ્રયત્ન કરવામાં આવ્યો હતો. બૂટ કેમ્પના પ્રથમ ૨ દિવસ માટે વિદ્યાર્થીઓને પ્રોબ્લમ સોલ્વિંગ અને ક્રિટીકલ થીંકિંગ થોટ ડિઝાઈન પ્રોસેસ પર માર્ગદર્શન અપાયું હતું. ત્રીજા દિવસે પ્રોગ્રામીંગ અને ઓટોમેશન તથા ચોથા અને પાંચમાં દિવસે અનુક્રમે ગેમ ડેવલોપમેન્ટ , સ્ટોરી ટેલીંગ ઈન પ્રોગ્રામીંગ અને ૩- ડી પ્રિન્ટીંગ જેવા વિષયો પર અવગત કરાવવામાં આવ્યા હતાં. જેને અનુલક્ષીને વિદ્યાર્થીઓએ વિવિધ ઈનોવેટીવ પ્રોજેક્ટ જેવા કે, એર પોલ્યુશન મોનીટરીંગ સિસ્ટમ , સિક્યોરીટી સિસ્ટમ , ગેમ અને લોજીક ડેવલોપમેન્ટ અને ૩-ડી પ્રિન્ટીંગ વિષયને અનુલક્ષીને વિવિધ ડિઝાઈનનું નિર્માણ કર્યું હતું. ગેમ ડેવલોપમેન્ટમાં પીંગપોન્ગ , ફોલિંગ ધ એપ્પલ , સર્કસ જેવી ગેમનું નિર્માણ કરાયું હતું. એર પોલ્યુશન મોનીટરીંગ સિસ્ટમ અંતર્ગત ઔદ્યોગીક એકમો દ્વારા વાતાવરણમાં છોડવામાં આવતાં હાનીકારક વાયુઓ જેવા કે કાર્બન ડાયોક્સાઈડ , કાર્બન મોનોક્સાઈડ , સલ્ફર ડાયોક્સાઈડનું વાતાવરણમાં કેટલું પ્રમાણ છે તે જાણી શકાતી સિસ્ટમનું નિર્માણ કર્યું હતું. જ્યારે ડોર નોટીફિકેશન અને કિંમતી ચીજ વસ્તુની સાચવણી માટે નોટીફિકેશન પૂરું પાડતી સિક્યોરીટી સિસ્ટમ પણ વિકસાવવામાં આવી હતી. ઓટોમેશનના સિદ્ધાંત પર કાર્યરત ઓટો રોબોટ , ઓટો રેલ્વે ગેટ વગેરે પ્રોજેક્ટ તથા ૩-ડી પ્રિન્ટીંગ દ્વારા પેન સ્ટેન્ડ અને કિચનનું નિર્માણ કરવામાં આવ્યું હતું. દેશભરના વિદ્યાર્થીઓને પણ આ પ્રકારના બૂટ કેમ્પનો લાભ મળી રહે તે માટે આગામી સમયમાં નેશનલ લેવલે પણ જીટીયુ દ્વારા ઓનલાઈન બૂટ કેમ્પનું આયોજન કરવામાં આવશે.

Figure 15 Media Coverage in Valsad Kesari on 8th June 2022

TUESDAY 7.06.2022

સ્ટુડન્ટ્સે એર પોલ્યુશનને મોનિટર કરીને એર સિક્યુરિટી સિસ્ટમ વિકસાવી

GTU દ્વારા ૫ દિવસીય ડિઝાઈન બૂટ કેમ્પમાં ૧૦૦થી વધારે વિદ્યાર્થીઓ જોડાયા

સિટીલાઇફ : શાળાકીય અભ્યાસ દરમિયાન જ ટેકનોલોજી પ્રત્યે વિદ્યાર્થીઓ પ્રેરાય અને ડિઝાઈન ,ઈનોવેશન જેવી પ્રવૃત્તિમાં ભાગ લે તેવા હેતુથી ગુજરાત ટેકનોલોજીકલ યુનિવર્સિટી દ્વારા ડિઝાઈન બૂટ કેમ્પનું આયોજન કરવામાં આવ્યું હતું. ૫ દિવસીય ડિઝાઈન બૂટ કેમ્પમાં ૧૦૦થી વધુ વિદ્યાર્થીઓએ ભાગ લીધો હતો. બૂટ કેમ્પમાં રાજ્યભરની વિવિધ સ્કૂલોના ૭ વર્ષથી લઈને ૧૭ વર્ષના વિદ્યાર્થીઓએ ભાગ લીધો હતો . બૂટ કેમ્પ વિશે વાત કરતા જીટીયુના વી.સી નવિન શેઠે કહ્યું કે, 'મશીન લર્નિંગ, આર્ટિફિશિયલ ઈન્ટેલિજન્સ , ડિઝાઈન થિંકિંગ આવનારા ટેકનોલોજીકલ ભવિષ્યની જરૂરિયાત છે. વિદ્યાર્થીઓ શાળાકીય અભ્યાસ દરમિયાન જ આ વિષયોથી અવગત થાય તે આવશ્યક છે.'

હવે એર પોલ્યુશન અંગેની નોટિફિકેશન મળી જશે

એર પોલ્યુશન મોનિટરિંગ સિસ્ટમ અંતર્ગત ઔદ્યોગિક એકમો દ્વારા વાતાવરણમાં છોડવામાં આવતાં હાનીકારક વાયુઓ જેવા કે કાર્બન ડાયોકસાઈડ , કાર્બન મોનોકસાઈડ , સલ્ફર ડાયોકસાઈડનું વાતાવરણમાં કેટલું પ્રમાણ છે તે જાણી શકાતી સિસ્ટમનું નિર્માણ કર્યું હતું. જ્યારે ડોર નોટિફિકેશન અને કિંમતી ચીજ વસ્તુની સાચવણી માટે નોટિફિકેશન પૂરું પાડતી સિક્યોરિટી સિસ્ટમ પણ વિકસાવવામાં આવી હતી. ઓટોમેશનના સિદ્ધાંત પર કાર્યરત ઓટો રોબોટ , ઓટો રેલ્વે ગેટ વગેરે પ્રોજેક્ટ તથા ૩-ડી પ્રિન્ટિંગ દ્વારા પેન સ્ટેન્ડ અને ક્રિયનનું નિર્માણ કરવામાં આવ્યું હતું.

Figure 16 Media Coverage n Sandesh on 7th JUNE 2022

Figure 17 Participants, Parents and the DIC Team

Report prepared by:
Priya Mishra and Urvashi Mesariya

Sd
DIC Incharge