



**Annual Report**  
2020-21

*Vigyan Ashram*

( A centre of Indian Institute of Education)

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[www.vigyanashram.com](http://www.vigyanashram.com)

## Introduction:

Financial year 2020-21 was difficult year for all of us. COVID19 pandemic has hit us badly. Year was started under lockdown and educational institutes were asked to remain closed throughout the year. When lockdown was announced on 23<sup>rd</sup> March 2020, there were 35 students on campus and they remain on the campus till June 2020. When lockdown was relaxed, students again joined campus in October 2020 but has to pause in March 2021 due to second wave of COVID.

Though everything was under lockdown, as a social organization we thought it our duty to respond to the challenges posed by the pandemic. With our limited resources, we had conducted various activities as a response to pandemic.

We had to change our program methodologies and priorities due to pandemic. We are thankful to all our funding partner and donors for their understanding and giving us flexibility in operations.

## A] Response to COVID 19 pandemic:

On campus, we had 35 students including engineers and DBRT students. They have access to all tools and workshops. We were operating in a bubble and hence could perform various functions. As a COVID response, we did following :

- Manufactured 7000+ face shields using laser cutting machine & distributed to COVID frontline workers like PHC staff, ASHA workers, hospitals, police personals etc. These face shields were made by open source design from fab-lab network & with financial assistance of Savitribai Phule Pune University (SPPU), Design Innovation Centre(DIC) department.
- We have developed following solutions for disinfection. These designs were adopted by many IBT schools and makers:
  - 'UV disinfection chamber' and UV torch for disinfection of small items, mobile, food packets etc. We have supplied 3 units of UV disinfection chamber to Maharashtra Police Academy (MPA, Nasik) for disinfecting their salon tools. The design files made open source in Do-it-Yourself (DIY). Link- [UV Cabinet-Prevention from COVID 19 | DESIGN INNOVATION CENTER \(vigyanashram.blog\)](https://vigyanashram.blog/2020/04/23/uv-cabinet-prevention-from-covid-19/).
  - A small Sodium Hypochlorite (NaOCl) production unit.
  - Disinfection chamber: A team of DIC students fabricated hydrogen Peroxide (H<sub>2</sub>O<sub>2</sub>) based disinfection chamber. Its design files, user protocol were standardized & published on open source platform. Link- [Vigyan Ashram disinfecting chamber - YouTube](https://www.youtube.com/watch?v=...)
  - Fab Lab team fabricated 'aerosol box' using laser cutter and supplied to Private hospital in Pune.
  - We have published advisory for rural businesses for creating awareness on work-safety COVID protocol. We have published series of posters in Marathi & Hindi languages and promoted through social media network.

**B] Technology based Entrepreneurship development Program (EDP):** COVID lockdown leads to people returning to their villages. There was a loss of livelihood and many youths were badly hit by the lockdown. Through social media platforms, we had reached to rural youth returned from the city. We had offered them online training on identifying livelihood opportunity in villages and also helped them in preparing business plan.

With help of PRAJ FOUNDATION, we had trained 270+ youth in skills like poultry-goat-dairy farming, vegetable nursery, food processing technology, renewable energy applications, computer aided opportunities etc. We are able to successfully establish 21 new rural enterprise through this effort.

We have also conducted two months Technology based Entrepreneurship Program (55 youth) & Faculty Development Program (31 teachers from 17 colleges) for science & engineering colleges with the support of Department of Science & Technology.

**C] Open House Exhibition :** We could not organised 'Open House Exhibition' on 30<sup>th</sup> July due to COVID restrictions. Therefore we had organised 'Virtual online exhibition' on 30<sup>th</sup> July 2020 on the anniversary of Dr.S.S.Kalbag. It was video tours, online presentations, facebook live sessions on Vigyan Ashram's program. A dedicated webpage [www.vigyanashram.online](http://www.vigyanashram.online) was created for exhibition with the technical support from Eaton foundation. We had more than 6000+ online visits & 30000+ facebook visits on the day of the exhibition.

**D] Kitchen garden program for WSHG's:** COVID pandemic has emphasized importance of healthy & immunity boosting food. To promote healthy vegetables production at household level we had launched 'Kitchen Garden' training in collaborated with Skill Training Advancement for Rural Society (STARs) forum. Aim of the program was to promote scientific & organic vegetable cultivation along with improvement in nutritional uptake of rural households. During 2020-21, we have trained 60 grassroot organization partners, 50 Sakhi's (Group leaders) of Mahila Arthik Vikas Mahamandal (MAVIM) and 75 WSHG members from Rajasathan & Uttarkhand state in collaboration with Rangсутra & Chinmay Organization for Rural Development (CORD).

**E] Dissemination of Solar Innovation :** As a part of SELCO foundation supported 'solar innovative technology dissemination' program, we have installed 27 innovative solar equipment's for improving livelihood of rural enterprises. Innovations like Solar Milking machine (10), Solar sewing machine (5), Solar black smithy blower (2), Solar printing station (6), Solar fridge (4) were installed at beneficiaries' home. They got upto 70 % technology adoption subsidy from Selco foundation.

**F] Fab School & Digital library :** A fab schools project @ Mukhai School in Pune district started with the financial support of La-foundation. Project aims in creating self-sufficient school campus by adopting renewable energy, water recycling, smart agriculture and digital fabrication technologies. The infrastructure will also be used for training school students under IBT program and as a demonstration unit for community. We have created grey water recycling, hydroponics, solar water heater, mini fab lab facility at Mukhai school.

Similarly a 'Spreading rural innovation through Do-It-Yourself (DIY) open source designs' project also initiated with a aim of establishing opensource digital library of various innovative technologies. Various designs are published on-line. They are available at [Spreading Rural](#)

Very are thankful to La-foundation for financial support & technical guidance for both of this projects.

**G] Important projects along with their funding partners & objectives undertaken by Vigyan ashram during 2019-20:**

S. N	Program name & supported funding partner	Funding partner	Objective
1.	Introduction to Basic Technology (IBT) program in secondary school.	Praj Foundation , Suzlon Foundation , L&T Infotech foundation.	Increasing impact & sustainability of IBT program in selected schools in Maharashtra State. 123 rural Schools including 12000+ students 445 schools instructors
2.	Technology based Entrepreneurship Program (TEDP) and Faculty Development Program (FDP).	Department of Science & Technology (DST)	Conducting online training program for science & engineering based college students & teaching faculties for promoting technology based entrepreneurship. TEDP : 55 students FDP : 31 faculty
3.	Post COVID response for creating livelihood opportunities through Entrepreneurship Development	PRAJ FOUNDATION	To train rural youths (especially COVID affected reverse migrants) and provide handholding - incubation support for enterprise establishment.  EDP program – 91 trainees
4.	Design Innovation Centre (DIC)	Savitribai Phule Pune University & Eaton Foundation	To conduct Design innovation courses with focus on Soil microbiology, Product design, Sensor technology and water & Waste management. Eaton foundation are supporting DIC with research fellowship grant to DIC students. • Design Innovation Centre (DIC) – 41 students
5.	DBRT Program and other short-term	Asha For Education , Eaton Foundation, SPA Education foundation and	Implementing various technologies-based enterprise & skills development training program for rural youth. 57 students, (12 girls)

	vocational training.	many other individual supporters	
6.	Providing training & hand-holding support for establishing a 'bakery unit' at Dantewada	District Administration of Dantewada	Providing training, tools/equipment procurement, enterprise establishment support to Bhoomgadi, Farmers Producer Organization (FPO). Students entrepreneur – 3
7.	Spreading rural innovation through Do-It-Yourself (DIY) open source designs.	La foundation, Pune.	Establishing opensource digital library various innovative technologies & demonstration of self-sustaining technology innovation at Mukhai (Dist-Pune) school.
8.	To conduct 'energy entrepreneurs hip training & pilot testing of solar innovation for improving livelihood.	SELCO INDIA Foundation	To adopt & demonstrate solar technologies. To develop solar innovations and conduct EDP training based on renewable energy livelihood sources.  27 villagers adopted these technologies.
9.	Fab Lab @ Pabal (Fab foundation), Fabrik Academy (Fab-textile), D-I-Y Lab @ Pune.	Eaton Foundation	To train students in digital fabrication  DIY lab Pune- 800+ Fab Academy students – 5
10.	Infrastructure Development: supported by	Asha for Education, SPA Education Foundation, INDUSA Endowment and Many individual well- wishers of VA	New common toilet block, recreation center for ladies hostel.  Technology based skill trainings – 183 Farmers field demonstrations- 100+

Some of the highlights of training programs are as follow:

#### 1.1.1 Diploma in Basic Rural Technology (DBRT):

DBRT is one-year full time residential program based on philosophy of 'learning while doing'. This program is accredited by National Institute of Open Schooling (NIOS). Program aims to train rural youth in 'multiple skills' & motivate them to start their enterprise in their own area.

Due to covid pandemic, we have adopted new innovative approach for training. We have made it blended online-offline training. We have provided DIY activity at home. We have also collaborated with 'Narmadalaya' (Kasarwad, Madhya-Pradesh), Yusuf Mehar Ali Centre (YMC, Panvel) as a 'work-bench' or 'satellite centre' for hands-on activities and local institutional support.

Total 57 students including 12 girl students enrolled for 2020-21 education year. Out of these 35 are at Pabal, 13 are Narmadalaya and 9 are at YMC, Panvel. We are hosting daily online theory class followed by hands-on practical activities. Students are learning & practicing various skills under support of local instructors at 'work-bench'. Program is supported by Asha for Education and Eaton India Foundation.

### 1.1.2 Design Innovation center (DIC) & FAB Academy program:

Vigyan ashram is DIC – Spoke Center of Savitribai Phule Pune University (SPPU). DIC-Vigyan ashram offers 'designing solution' program for college interns, graduate students from science & engineering background. Course aim at training students in application of science & engineering through 'design thinking' philosophy. During 2019-20, 41 students enrolled for work on various technology challenges & build prototypes. Details of their project are available on [www.vadic.vigyanashram.blog](http://www.vadic.vigyanashram.blog)

Fab academy 2020, course was started from January 2021. It's a 6 months program to learn 'How to make almost anything!' through skills of rapid prototyping & digital fabrication. This year we have 5 students including 3 faculties from 'Shri Sant Ganajan Maharaj College of Engineering' (Shegaon, Dist-Buldhana, Maharashtra). Students will stay on campus and learn various multi-disciplinary skills using digital fabrication. Previous batch of 5 students (Yr.2020 batch) completed their course in July 2020.

### 1.1.3 Rural Technology-based skill trainings courses:

Due to COVID pandemic offline residential trainings were not possible this year. It gives us an opportunity to reach out to maximum rural beneficiaries using online courses. Following are some of the important skill courses conducted during 2019-20 :

Type of Programme and Topic	Duration	Number of trainees
Technology based short term course (Online)	4 to 6 weeks (Online minimum of 50 Hr)	Food processing technology: 61 Poultry farming: 23 Goat farming: 22 Solar energy applications: 28 Computer based applications: 13 Aquaponics & Hydroponics farming: 36 (183)
Farmers field demonstration	1 to 2 days	Farmers field demonstration
WSHG's training in Collaboration with STARS Forum & Mahila Arthik Vikas Mahamandal (MAVIM)	8 Days (Online 12 Hr)	Kitchen Garden (Marathi)- 110 Kitchen Garden (Hindi)- 75
Technology base EDP & FDP program (Online)	58 (90 Hrs) & 13 (32 Hrs) days	Technology Based Entrepreneurship Program (TEDP)- 57 Faculty Development Program (FDP)- 36

#### 1.1.4 Introduction to Basic Technology (IBT):

IBT ('Multi skill Foundation Course (MFSC)') program is recognized as pre-vocational training program Class IX (Level1) and Class X (Level2) under National Skills Qualification Framework (NSQF). VA is providing technical support to 123+ Schools benefiting over 13000 students in Maharashtra & Chhattisgarh state. An online monitoring [www.myibtschool.com](http://www.myibtschool.com) keep real time track of the program & showcase various students' activities in these schools.

Following are some of the highlights of IBT program:

- IBT school instructor training program was conducted through online mode during 6<sup>th</sup> to 27<sup>th</sup> June. Total of 740 instructors & students participated in training to learn COVID19 fighting technologies along with regular IBT skill content. Apart from this 'online classes' were conducted by VA team every month along with hand-on DIY activities for class 8,9 and 10<sup>th</sup> standard students.
- IBT schools contributed to the Fight against COVID 19 by way of making masks, sanitizer stands, hand washing station, UV disinfection boxes, kitchen garden etc as part of their community services. Though schools were closed. Students are doing many DIY activities at home.
- 'Technovation' an annual IBT students innovative project exhibition was organized online on 26<sup>th</sup> Feb 2021 till 4<sup>th</sup> March 2021. IBT schools & students participated in virtual exhibition through video submissions. VA team visited schools & carried out video recording of student's projects. Total 20 project were exhibited based on theme of 'COVID response'. Students' projects are available on <http://technovation.myibtschool.com>

#### G ] Appropriate technologies development and dissemination:

Vigyan ashram is working on development and dissemination of appropriate rural technology. VA is a core support organisation of Dept of Science & Technology (Govt of India). Following are important highlights of technology development work during 2019-20 :

SN	Source of Technology	Name of Agency/Institution/Individual Expert
1.	Generated in-house by core staff	<ul style="list-style-type: none"><li>• Agro-waste composting by effective microbial consortium derived from <i>Azolla (Azolla pinnata)</i> + lignin rich agro-waste.</li><li>• DNA analysis &amp; mass multiplication of agro-waste composting culture.</li><li>• Cost effective fertigation of hydroponics vegetable cultivation.</li><li>• Low cost Ultra-violet light based water filter for potable water.</li><li>• Solar PV based fan-pad system for polyhouse climate control.</li></ul>
2.	Generated in-house by employing outside experts	<ul style="list-style-type: none"><li>• COVID-19 response technologies for frontline workers including face-shield, disinfection chamber, UV sterilization etc.</li><li>• COVID-19 work safety advisory for rural artisans / entrepreneurs.</li></ul>
3.	Borrowed from an outside institution	<ul style="list-style-type: none"><li>• Induced breeding of climbing perch (<i>Anabus testiduneus</i>) from Central Institute of Freshwater Aquaculture (CIFA).</li><li>• Various solar based innovative technologies for rural application from SELCO Foundation.</li></ul>
4.	Modification of technology/know-how being used by the beneficiaries	<ul style="list-style-type: none"><li>• Pyrolysis of plastic waste: technology development work in collaboration with Marathi Vigyan Parishad (Under progress)</li></ul>

Some of the above technology prototype & field implantations details are as below:

- Rice De-husking machine technology is tested & certified by 'Farm Machinery and Post-Harvest Machinery & Equipment Testing Centre' of ICAR- Central Institute of Agricultural Engineering, Regional Centre, Coimbatore, Tamil Nadu. Now the machine is eligible for bank finance, subsidies.
- Young Women Fellowship (WOS-B) project: Ms.Sonal Shinde prepared microbial consortium for effective & fast decomposing of agricultural residue waste. She has successfully isolated microbial culture from Azolla + high lignin reach agro-waste, done mass-multiplication and tested its effectiveness at 26 different location in shirur, Ambegaon and Rajgurunagar block of Pune district. She is further working on purification & DNA analysis of microbial consortium.
- Solar powered fan-pad system: Evaporative cooling in climatic controlled polyhouse requires continues grid supply with high energy cost. Sanket successfully developed & installed solar PV based fan-pad system. This system comprises of solar PV (335-watt, 24 V), Variable Frequency Drive (2.2 Kw, 2 No), colling fans (1.5 HP AC, 2 No) with automated temperature/humidity sensing, controlling and data logging system.
- Akash Dhumal developed a cost effective fertigation nutrient mix for hydroponically grown spinach. He is using leaf analysis based fertigation approach while replacing costly nitrogen source like calcium nitrate (  $\text{Ca}(\text{NO}_3)_2$  ) with nitric acid ( $\text{HNO}_3$  ).  
For technology development trials please visit [www.vadic.vigyanashram.blog](http://www.vadic.vigyanashram.blog)

## H. Webinar

VA team hosted technology-based webinars in collaboration with partner organizations. These webinars helped us in reaching to large number of people.

Following are details of webinars-

SN	Topic	Target audience	Number of participation
1	How to make masks, face shields	NGOs	16 social organizations
2	Technology based Agri-Entrepreneurship in association with DDKF, Mumbai.	Budding agri-entrepreneurs	50
3	Rural livelihood opportunities in Poultry farming	Youth/SHG's/farmers	67
4	Rural livelihood opportunities in vegetable nursery enterprise	Youth/SHG's/farmers	22
5	Rural livelihood opportunities in renewable energy based enterprises in association with SELCO Foundation	Youth	80
6	Business opportunities in 'Vegetable & fruit solar drying technology' in association with STARs forum	Youth/SHG's/farmers	77
7	Opportunities in computer-based enterprise	Youth	94
8	Wikipedia: open source web-publications	Dr.DYP college, Pune	34
9	Rural livelihood opportunities in renewable energy based enterprises	Youth/SHG's/farmers	39
10	Rural enterprise opportunity in web-publication (Wikipedia)	SHG's associated with Chaitanya NGO (Rajgurunagar)	30



12	Rural livelihood opportunities in goat farming enterprise	Youth/SHG's/ farmer	28
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### I] Infrastructure Update :

Following are important infrastructure development work completed during 2019-20.

- A new toilet block (ladies & gents) near dormitory hostel with 400 Sq Ft RCC structure containing 4 WC units (for each section), grey water recycling and 14000 lit rain water harvesting tank. (Asha for Education)
- Recreation center for ladies hostel with roof cover (1500 Sq ft) with washing machine & dining seat-out facility. (Asha for Education & INDUSA)
- Epoxy flooring (refurbishment) for 5600 Sq ft area of mechanical workshop, Fablab and electrical section. (Kusum Soham Parivar and SPA Education foundation)
- New lab instruments: Polymerase Chain Reaction (PCR) & Electrolysis Unit for DNA analysis, Ion Selected Electrode (ISE) for Ammonia & Nitrate analysis. (DST-WOSB)

### J] Do-It-Yourself lab & Wikipedia project:

Do-it-Yourself lab @ JPNC, Pune went completely 'online' mode during 2020-21, due to rises in COVID cases, lockdown & restrictions on travels. We missed energetic presence & tinkering activities of Chota Ustad at DIY lab. But positive side is, we are able to reach 10 times more students through series of online DIY activity-based workshops for Maharashtra & Chhattisgarh state. Following are some of the highlighted workshops conducted during 2020-21:

SN	Name of workshop	Duration	Number of sessions	Number of participants
1	'Basics of electronics & 3 D designing' with hands-on sessions on <i>Scratch &amp; TinkerCad</i>	May-June-July 2020	15	578
2	'Become a young engineer' with hand-on activities on small science projects	Sept-Oct-Nov 2020	11	1232
3	'Make your own toy' with hands-on activities of scientific toy making #	Dec 20- Jan 21	9	634
4	Khel Khel Mai in association Mukangan exploratory (Pune)	January 2021	4	Live in Youtube
5	Make Your Own Toys in association with SCERT	January 2021	2	Live on Youtube
6	Make Your Own Toys @ Chhattisgarh in association with UNICEF and Rajiv Gandhi Shiksha Mission	Feb-March 2021	4	500+ teachers of 100+ Schools in Chhattisgarh state

- VA-DIY team also participated in 'Indian Toy Fair' on 2<sup>nd</sup> March and conducted activity of making musical instrument ([Activity 15: Make your own toys Musical Instruments - YouTube](#)) and make your own toy on cinematic theme ([Activity 17: Make your own toys on cinematic theme - YouTube](#))

### **Wikipedia updates:**

Wiki-girls published many articles and digital books on Wikipedia Marathi ([https://en.wikipedia.org/wiki/Marathi\\_language](https://en.wikipedia.org/wiki/Marathi_language)). During 2020-21, we have published 45 articles and 186 books comprising 23193 pages by scanning & converting them in to OCR format.

### **K] Award:**

Vigyan ashram team has participated in Fabx-live virtual fablab conference during 27<sup>th</sup> to 31<sup>st</sup> July. As a part of event VA team led by Ms Pooja Jadhav participated in 'social distancing challenge' & 'team lead by Ms Aditi Kharade participated in 'hand washing challenge'. Pooja Jadhav won third prize of 'Brother computerised sewing machine' and Aditi won first prize of 'Forest CNC' machine.

### **L ] Staff trainings workshop / Conferences:**

Due to COVID19 Pandemic travel restrictions physical trainings / workshops were not possible, but staff attended online trainings and learnt new skills. Following are some of the highlighted trainings by staff as –

<b>S.N</b>	<b>Name of training organization/experts</b>	<b>Topic of training</b>
<b>1</b>	Indigram Labs Foundation technology business incubator (NSTEDB) by Ranajeet Shanbhag	National Initiative for Developing & Harnessing Innovation
<b>2</b>	Central Institute of Freshwater Aquaculture (CIFA), Bhuvneshwar (ODISHA) by Ranajeet Shanbhag	Seed production & hatchery management of air breathing fish.
<b>3</b>	Promoting sustainable development through skill based education by Sachin Puneekar	Education for Sustainable development by Engagement Global, Germany

### **M] Donors and supporters:**

We are able to continue our work due to financial support of many individuals and foundations. Following individuals have supported VA in 2020-21

Mr.Anil Date, Mrs.Seema Jaynat Gadkari, Mr. Jayant Pai (Social Seva Initiatives), Mr.Ramkrushna Sonde, Mr.Atul Kulkarni, Mr.G.G.Parikh, Mrs.Vidya Kasrgod, Mrs.Asha Ratilal Adatiya, Mr.Abhay Kuberkar ,Mr.Shrirang Deshinka, Dr.Kishan Bhatia, Soham Mitra Parivar. We are thankful for their kind support and appreciation of our work.

### **N ] Management committee meetings:**

Vigyan ashram's management committee comprises on of Mr.Ashok Kalbag, Mr.Vijay Kumar, Mr.Mahendra Rajgude, Mrs.Anjali Chipalkatti, Dr.N.S.Nikam, Dr.Suhas Altekar and Dr.Yogesh Kulkarni. It is guided by Hon Chairman, BOT-IIE Dr.Arun Adsool and Hon Director-IIE Dr.Kalake. The management committee meetings were held on 24<sup>th</sup> June 2020, 10<sup>th</sup> October 2020 and 17<sup>th</sup> January 2021 to discuss strategic, administrative and financial matters.

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Vigyan Ashram is thankful to all funding partners, friends, supporters, students, staff, Board of trustees of IIE and Management committee members, Villagers from Pabal village for their continuous guidance and support.