Annual Report

2022-23

Vigyan Ashram

(A centre of Indian Institute of Education)

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Introduction:

Team Vigyan Ashram is pleased to present the annual report for the FY 2022-23. This year we have established two Fab-labs in tribal region of Maharashtra & Madhya-Pradesh. We are able to equipped 22 IBT schools with 3D printers and thereby taking IBT program to IBT 2.0. In our effort to strengthen existing Atal tinkering Labs (ATLs), this year we have started working with ATLs Karnataka and Telangana in addition to ATLs in Andhra Pradesh. We have established state training ATL labs at Vijaywada, Bangalore and Hydrabad.

We are also able to upgrade our infrastructure facility by construction of new agricultural classroom & up-gradation of food processing unit. We have done documentation of technologies developed through Design Innovation Center (DIC) and documented technology development work of Grey water recycling system, composter, Water filter, Grey water recycling system.

Dr.Yogesh Kulkarni was invited as a member of 'National Focus Group' appointed by NCERT to write position papers on vocational Education as per New Education Policy 2020.

We are also able to scale up our efforts through our alumni entrepreneurs and network NGOs. We are very thankful to our staff members, students, volunteers, financial partners, donors, Management committee members and Pabal villagers for their continuous support & endowments.

Educational Program:

Educational program of Vigyan Ashram is based on 'Learning doing while' philosophy. Providing community services, multi skills training and hands on experience are basic features of all educational programs.

i] Diploma in Basic Rural Technology (DBRT): One-year residential DBRT program started from 10th July 2022. It's a multi-disciplinary skill training course based on 'learning while doing' philosophy. Program is accredited by the National Institute of Open Schooling (NIOS). This year we have **54 students enrolled for the course including 8 girls** from Maharashtra, Odisha, Madhya-Pradesh state. We have also introduced a 2 month on-job internship for students in the months of April & May. Students are learning skills in the areas of Engineering, Energy & Environment, Agriculture-Animal husbandry and Home & Health skills with special emphasis on self-employment.

DBRT 2021-22 completed their course on 25th June 2022 with 67 students and 22 short term course students. We are thankful to ASHA for Education, Praj Foundation, SPA foundation, Eaton Foundation and individual donors for supporting the DBRT program.

ii] Design Innovation center (DIC): Design Innovation Centre (DIC) is a spoke center of Savitribai Phule Pune University (SSPU). DIC offers short term internships & fellowships and engages them to work on real life problems. Total 51 students enrolled for the DIC program including 3 students from Swiss engineering school EPFL (École Polytechnique Fédérale de Lausanne), Switzerland. These students worked on various

research projects in engineering, electronics, soil microbiology, food processing etc. Their project can be viewed on https://vadic.vigyanashram.blog/

We are thankful to Savitribai Phule Pune University (SPPU), Eaton Foundation, La-foundation (Dassault system) for their support to student research work.

iii] Fab Academy & MDDI Program:

Fab-academy a 6 months diploma program in digital fabrication conducted by Fab Foundation (https://fabfoundation.org/). Course encourages the philosophy of 'How to make almost anything' with emphasis on hand-on training in rapid prototyping & digital fabrication. Dr.Neil Gershenfeld, Professor at Massachusetts Institute of Technology, USA is conducting the program through video conferencing followed by hands-on practices at Vigyan Ashram fab-lab. During batch 2021-22, concluded in June 2022, 5 students successfully completed the program. Fab-Academy 2023, started in January'23 with 2 students. Mr Suhas Labade (Fab Lab manager) also guided 12 students from Fab-Lab- Thimpu (Bhutan) as local instructor.

Scan for Fab Academy 2022

Master in Design for Distributed Innovation (MDDI): Vigyan ashram registered as a node for conducting Master in Design for Distributed Innovation (MDDI) course in collaboration with Fab-City foundation and Institute for Advanced Architecture of Catalonia (IAAC). Now students can pursue Masters in Design from European university by staying in Pabal village and earn 60 European masters credit. The program focuses on design, technology, ecosystems for self sufficient communities. We have one student enrolled for the 1st batch. The course was started in October 2022 and will be completed in July 2023.

iv] Introduction to Basic Technology (IBT):

IBT program is implemented from class VIII-X std. It integrates school curriculum with hands-on activities (skills) & community need for real life learnings. Students learn various technologies useful for their communities. VA is supporting IBT program in 140+ Schools in Maharashtra benefiting over 15000 students. It's recognized as a pre-vocational training program (Level1 and Level2) under National Skills Qualification Framework (NSQF) as 'Multi skill Foundation Course (MFSC)'. During 2022-23, special emphasis is given on introduction of digital fabrication, 3D printing technologies and developing content for class VI to VIII in Hindi Language.

Following are some of the highlights of program :

- An instructor training, monitoring & technology upgradation support provided to 55 IBT schools during 2022-23 in Maharashtra. Program benefited around 6965 students (3752 boys & 3213 girls)
- As a part of updating the IBT program, a basic electronics & 3D printing lab was established in 22 schools. These labs include 3D printers, designing PCs and basic electronics kits. Students enjoy learning of 3D design, printing, soldiering & sensor application while designing small projects using this facility.
- 5 schools in Pune district (Ambegaon-2, Junnar-3) got financial support from Mahale Engi Service Pvt ltd CSR initiative. Under this support schools upgraded their tool sets

with better learning environment & trained instructors. IBT School at Chikhali (Haveli) got support for establishment of a 15 Kw on-grid solar PV system.

- 4th Technovation Exhibition of IBT school project was organized on 16th February at LIT-Mindtree campus, Pune. IBT students from 36 schools presented 50 innovative projects during the exhibition. Best project award won by student of Adarsh Vidyalaya, Amboli for 'Smart Scare-Crow' project. 1st & 2nd runner up awards were won by students of Anandrao Patil Prashala (Balewadi), and Rajapur High School (Ratnagiri) for 'low-cost treadmill' and 'Betel nut cutter' project.
- Students from 12 schools enthusiastically participated in Atal Tinkering Lab (ATL) marathon 2022. It's a flagship innovation challenge for high-school students organized by Atal Innovation Mission (AIM).
- IBT Amboli school student project of 'Transmission line leakage identifier' was selected among top 30 projects at national level competition. These students participated in National Children's Science Congress - 2023 held at Ahmedabad, Gujarat in January 2023.
- VA team was invited as a resource person by STARs forum to write teachers handbook for 'Leanring while doing' program for class VI-VIII.

The IBT program is supported by various CSR initiatives. We are thankful to all our CSR partners.

v] Do-It-Yourself (DIY) Lab:

DIY lab works towards building maker-culture in a society. DIY lab is equipped with digital fabrication facility (3D printing, laser cutting), electronics and programming tools. DIY lab provided training through monthly-membership & short-term training workshops. Total 232 students/teachers directly benefited from the lab during 2022-23, including schools' students (56), Atal Tinkering Lab teachers (131) and Introduction to Basic Technology (IBT) instructors (45). Apart from this student also developed many innovative tinkering projects.

Please scan QR code to watch DIY lab projects.

vi] Support to Atal Tinkering Lab (ATL):

A project on strengthening of Atal Tinkering Labs (ATL) started in Karnataka, Andra-Pradesh & Telangana state with support of UNICEF. Under this project training workshops for 86 Atal Tinkering Lab (ATL) teachers, 30 District Science Officers (DSO) and 66 school Head-masters from Andra-Pradesh, Telangana and Karnataka state were conducted. We have established three state ATL labs in these states. We are also conducting online sessions in Telagu and Kannada for the schools. During 2022-23, we have conducted 31 online training sessions. On an average 4600+ students attended this sessions/week. Scan code to watch sessions.

Technology development & dissemination program :

I] Design Innovation Centre (DIC):

Following are some of the important technologies developed and under development at Vigyan Ashram during 2022-23.

Black Soldier Fly (BSF) for waste management:

Black soldier flies (BSF) are insect larvae that grow on kitchen / slaughter waste. BSF larvae have high nutritional value and attract good value as an animal-feed. A complete package-of-practice is developed in DIC to cultivate BSF and set up a waste-recycling & production system. It includes BSF breeding chamber with climatic control system, feeding management protocol, cultivation bins for housing-society & dump-yards etc.

A field trial setup is established at Darpan Housing society, Rajgurunagar to process 25 to 30 kg waste/day in collaboration with Rajgurunagar Nagar-panchayat. Trials are also under-way at military campus (Dighi) for standardizing breeding & rearing of larvae on a commercial scale. We are also studying utilization of mature larvae as a feed for poultry birds.

Solar dryers for vegetables & spices:

Solar flat-bed polycarbonate dryer : A solar flat-bed dryer with polycarbonate (UV stabilizing) sheet lid designed for vegetables. It has 5 kg fresh vegetables / onion loading capacity with 20.26 % drying efficiency. It's a low cost solar dried with enhanced color / flavors retention due to UV light filtration through polycarbonate sheet lid. Its design & fabrication protocol is standardized and made available as a training manual. So far 7 units are manufactured by our social enterprise for Women Self Help Group (WSHG), farmers.

Polyhouse automation control & Graphical User Interface (GUI):

A polyhouse climatic data collection system is designed. Data is collected using different sensors. Results are displayed on website. The system developed has application in polyhouse, BSF breeding chamber climate control etc. DIC fellows built a Graphical User Interface (GUI) for easy access & storage of data.

Development of Agricultural waste composting microbial consortium:

Ms Sonal Shinde has developed an agricultural waste composting culture. It was supported by Department of Science & Technology (DST), Young Women Scientist Fellowship (WOS-B) program. It was tested with 116 farmers of Wadgaon-pir (Ambegaon block, Pune district). As a part of field research activity approx. 160 tons of agro-waste was treated to produce 120+ ton compost.

Solar greywater recycling system:

A solar powered greywater recycling system was fabricated & installed at Kahnersar (Tal-Khed,Pune) under the International Solar Innovation Council (InSIC) project. The unit has 2500 lot / day water filtration capacity with Chemical Oxygen Demand (COD) reduction from 2700 ppm to 250 ppm in 48 Hr treatment time.

II] Fab-Lab @ tribal area :

We have established two fab labs under project. This project was completed under Department of Science & Technology (DST, Govt. of India) sanctioned project under Tribal Sub-Plan (TSP) scheme. During 2022-23, digital fabrication labs were established at 1) Nimar Abhyudaya Rural Management & Development Associations (Lepa-Punarvas, Dist- Khargoan Madhya-Pradesh) 2) Shri.Nityanand Educational Trust (Hamrapur Galtare, Palghar, Maharashtra). Both labs started operations from August 2022. These labs trained around 300 local youth (college/ ITI/ school students) through different training workshops.

III] Distance learning library-

A Distance Learning Library (DLL) project aims to create comprehensive livelihood-based skill training videos. These videos are made available on www.theskillguru.in website . During 2022-23, scripting, video shoot, editing and LMS uploading work was completed for 5 skill courses. These courses are biofloc fish farming, paver block making, solar water installation, Fibre Reinforced Plastic (FRP) and agro-waste composting.

Infrastructure Development:

i] New agricultural section classroom & sport ground: Construction of new classroom completed. New Agriculture classroom has built up area of 728 Ft^2 (429 Ft^2 teaching space + storage room & attached WC unit). This building also has a rainwater harvesting tank (28000 lit), computer screen & storage facility.

ii] Modernization of food processing lab: Food processing lab is renovated with SPAEF support during 2022-23. Now new facility has an additional RCC constructed processing unit with 240 Ft2 floor space. New lab has better ventilation (big windows) & lighting, proper electrical connections and a rooftop for solar drying facility. Total floor space for modernized food processing laboratory is 1215 Ft2 with improved ventilation, proper working space and storage facility.

Agricultural section classroom & new food processing lab was inaugurated by the hands of DBRT students on 18th March (Art Day).

We are thankful to ASHA for Education, SPA foundation and many individual donors for their support.

New Agri Room

New Food lab

Important Highlights

i] Wikipedia project: Wikipedia team achieved a new benchmark of 19000+ edits. During 2022-23 they scanned 45 books comprising 7944 pages. Following are some of the highlights of their achievements -

- On 27th November, a wiki-source training workshop was organized at Pabal campus. Workshop trained 13 participants in wiki-editing and proofreading.
- Wiki-team participated in 'proof-read-a-thon' India competition during 14th to 30th November. Team of 6 girls edited 2233 pages during the competition period.
- Komal Shambhudas, Priyanka Jadhav and Pooja Jadhav got selected for Wiki-Conference India 2023 to be held at Hyderabad.

ii] Staff trainings, presentation & Awards:

Following are some of the highlights of staff participation in invited talks during 2022-23 :

- On 9th & 10th June, Dr.Yogesh Kulkarni gave a talk on 'technology based rural entrepreneurship opportunities' at UNNAT Bharat regional corporation institute orientation program at NIT Suraj.
- Dr.Yogesh Kulkarni gave a presentation on 'Modelling self-sufficient villages' on the Expression of Interest series by La-Foundation (Pune) on 25th August.
- 25th November : 70+ foreign delegates visited Vigyan Ashram. The field visit was part of an annual symposium of Living lab organised IIT-Bombay (CTARA) & Technical University of Munich (TUM). VA is a partner of CTARA, IIT Mumbai.

- Vigyan ashram won a Covid hand washing challenge during FabX international conference (2020). As an award we received 'Forest scientific corporation (USA) make CNC-machine'. The award was received at Pabal on 19th November. It's an advanced machine for wood routing & cutting operations in the workshop section.
- Vigyan Ashram conducted 'Skill training: What works & how to make it happen' workshop for NGO staff members on 5th to 7th December at J.P Naik Center for Education & Development, Pune. Training was conducted in collaboration with Skill Training Advancement of Rural society (STARs) forum as a part of its 13th Annual conference.
- Ranajeet Shanbhag attended India International Science Festival (IIFS)-2022, held at MANIT, Bhopal during 21st to 23rd January. He delivered a talk on 'Improving accessibility of education among the unreached' at National Social Organization & Institute Meet (NSOIM).

Donors and supporters:

We are very much thankful for the financial support of many individuals and foundations. Following individuals have supported the Vigyan Ashram program in 2022-23.

Vidya Arvind Kasargod, Swati Tongaonkar, Satish Dimanbar Kulkarni, Sanjivkumar Somdatta Sharma, Rajan Chudasama, Pravinbhai Chudasama,N G Paranjpe Pratishisthan.

LTImindtree Limited, Mahle Engineering services india private limited, Eaton India Foundation, Praj Foundation, SPA Education Foundation and Asha for Education.

We are thankful for their kind support and appreciation of our work.

Management committee meetings:

Vigyan ashram's management committee comprises Mr.Ashok Kalbag, Mr.Vijay Kumar, Mr.Mahendra Rajgude, Mrs.Anjali Chipalkatti, Ms Pallavi Shanbag and Dr.Yogesh Kulkarni. The management committee meetings were held on 3rd July, 4th December and 18th March to discuss strategic, administrative and financial matters.

We are thankful to MC members of VA, volunteers, staff, Students, parents, Villagers of Pabal and our financial partners, CSR supporter for their continuous support.