Office of the Principal
Scientific Adviser to
the Government of India

STEM EDUCATION

SCIENCE | TECHNOLOGY | ENGINEERING | MATHEMATICS

COMPENDIUM

BCKIC
Bhubaneswar City
Knowledge Innovation
Cluster Foundation

Office of the Principal
Scientific Adviser to
the Government of India

STEM

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Cluster Foundation

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

The S&T Clusters express our sincere gratitude to the Office of Principal Scientific Adviser to the Government of India for their unconditional support in nurturing and implementing STEM initiatives.

We are thankful to the education departments of the Delhi, Maharashtra, Telengana and Orissa state governments who have worked closely with the clusters to facilitate STEM initiatives in various educational institutions.

We are also immensely grateful to our sponsors and donors for their generous support, which has made these initiatives possible. Their belief in our vision has been instrumental in driving our efforts forward.

Furthermore, we would like to thank all the Cluster partners – schools, colleges, universities, industries, incubation centres and individual experts for their commitment and enthusiastic participation in our programs. They have played an instrumental role in the success of our initiatives.

INTRODUCTION

The Office of PSA has established S&T clusters as formal platforms for enabling regional and national collaborations to foster the sharing of knowledge, resources and technology amongst S&T organizations. S&T Clusters work to create strong linkages between academic institutions, national & state research laboratories, and other stakeholders like relevant ministries, industry partners, start-ups, MSMEs, state governments, philanthropic foundations, and international organizations. Amongst other outcomes, these linkages allow for high-quality capacity building, industry-relevant skill development amongst youth and young professionals, and promoting innovation by translating ideas from laboratories to the market.

The National Education Policy of India 2020 (NEP 2020), which outlines the vision of a new education system in the country, was released around the same time S&T Clusters were incepted. Intending to create an education system that is aligned with the aspirational goals of 21st-century education, NEP 2020 emphasizes the need and importance of nurturing potential human resources, building capacity, enhancing the regional educational, research, and innovation ecosystems, along with a vision of ensuring inclusive and equitable quality education and encouraging the spirit of innovation and entrepreneurship. With significant alignment in mandates, Clusters are the best platforms for national - level implementation of NEP 2020, especially STEM education. Over four years, S&T clusters like Pune Knowledge Cluster (PKC), Bhubaneswar City Knowledge Innovation Cluster Foundation (BKCIC), Research and Innovation Circle of Hyderabad (RICH) and Delhi Research Implementation and Innovation (DRIIV) have enabled several initiatives to test and promote new pedagogies, validate technologies, and provide mentorship to students provide mentorship to students in schools, colleges and universities across India. The highly impactful outcomes achieved in promoting STEM education have been possible only because Clusters have been able to leverage the strength of their partners - government and private institutions, industries, start-ups and NGOs and build scalable initiatives where partners contribute in terms of infrastructure, human resources and funds.

Through this compendium, we wish to highlight how the Cluster model has successfully enabled initiatives in STEM education and the outcomes of these initiatives that have led to a nation-wide impact.

EXECUTIVE SUMMARY

Guided by the fundamental principles described within the NEP 2020, the four S&T Clusters in Bhubaneswar (BCKIC), Delhi-NCR (DRIIV), Hyderabad (RICH), and Pune (PKC), in collaboration with several partner organizations, have implemented diverse projects and capacity-building activities in the last four years focusing on promoting STEM based pedagogies, innovations and careers amongst the youth. Key descriptions and highlights of these projects are described below.

ENHANCING PEDAGOGIES

Aligning with the NEP Chapter 20.3, one of the key focus areas for Clusters has been enhancing pedagogy and training school teachers to develop the skills required for effective 21st-century education and transform the teaching-learning process into a holistic, integrated, enjoyable and engaging experience. This involves creating new learning modules that can be digitally implemented, using digital resources in the classroom and technology for monitoring and assessing teaching-learning outcomes.

The 'Teach with Tech' program by PKC has enabled 25 government schools with digital infrastructure, benefitting over 2000 students and teachers. 'ChemAmaze', another project by PKC intends to create an open-source repository of educational games mapped to the school curriculum that can be used nationwide to implement game-based learning in Science at the 6th to 8th grade level.

PKC and DRIIV have collaborated to conduct pilot programs to enable the effective utilization of the Atal Tinkering Labs (ATL) by training 10 schools in Delhi and Pune. Insights from these programs have been shared with AIM-ATL as a report to enable implementation of strategies for increased and better utilization of ATLs across the country.

FELLOWSHIP, SCHOLARSHIP AND MENTORSHIP PROGRAMS FOR STUDENTS AND EDUCATORS

Another focal area for the Clusters has been to ensure equitable and inclusive education, in alignment with NEP Chapter 6. Accordingly, the clusters and their partner organizations have developed programs to support and mentor students, educators, and young entrepreneurs.

The 'WEnyan Scholarship & Mentorship Program for Women in Chemistry' by PKC, 'Scholarship, Mentorship and Internship Programme for Women in STEM Education and Careers' by RICH and 'Bayer Fellowship Program – MEDHA' by BCKIC work towards providing scholarships, mentorship and internships to undergraduate, postgraduate and doctoral students for pursuing careers in STEM. These initiatives have benefitted 195 students, out of which 145 are women.

DRIIV implements the Earth Watch Fellowship Program which provides opportunities for educators who are passionate about environmental issues and conservation of environment, are excited to learn hands-on research techniques from top scientists, and eager to share their experiences in the field with their students and communities back home. These two programs have collectively reached over 127 individuals, resulting in 25 fellowships.

PKC's flagship Citizen Science program 'One Million Galaxies' aims to foster scientific curiosity amongst the masses by training enthusiastic citizens and engaging them in astronomical data analysis. Over 1000 scientists have been onboarded through this program and over 1700 citizens have been trained.

INNOVATION & ENTREPRENEURSHIP INITIATIVES

Transforming knowledge into action is the next step in education. Aiming to strengthen the ecosystem of innovation and entrepreneurship, BCKIC ran a two month long 'pitching cum entrepreneurship Boot Camp-OPEN' and reaching over 1500 innovators in 15 cities in 13 districts in Odisha. Five top innovations were selected to arrange for incubation support, mentorship and funding.

Besides this, BCKIC has also conducted 'Intellectual Property Rights (IPR) Awareness & Facilitation Drives', which included 15 successful training programs leading to the drafting and filing of 5 patent applications. Over 1200 participants, including college and university students, research scholars and faculties, attended the training programs.

PKC hosted a state level conference- EduConclave: Sharing Best Practices in STEM, a platform that bought together 100 individuals from over 30 organizations in Maharashtra to showcase innovative tools and pedagogies in STEM Education.

CAPACITY BUILDING AND OUTREACH ACTIVITIES

Apart from standalone programs, the S & T Clusters have hosted several capacity building and outreach activities, including workshops, courses, roundtable discussions, seminars and symposiums under distinct themes. Several of these programs have been in collaboration with state governments. Over the past four years, 185 capacity building and outreach activities have been conducted, benefitting 22,543 individuals, 62 districts and four states.

This report is a compilation of the cumulative efforts of the S&T Clusters in implementing different STEM education initiatives from 2020 to 2024. The following sections provide a detailed account of all the programs and activities conducted by the clusters under the themes mentioned above, along with the impact and future outlook.

About S & T Clusters working on STEM Education

Pune Knowledge Cluster (PKC)

The Pune Knowledge Cluster is hosted by the Inter-University Center for Astronomy and Astrophysics (IUCAA) and is registered as a private (not-for-profit) company- Pune Knowledge Cluster Foundation.

The current focus areas of PKC include:

- Big Data & AI
- Capacity Building
- Health
- Sustainability & Environment
- Sustainable Mobility

Website link: https://www.pkc.org.in

Bhubaneswar City Knowledge Innovation Cluster Foundation (BCKIC)

The Bhubaneswar City Knowledge Innovation Cluster Foundation (BCKIC) is hosted by the Technology Business Incubator of Kalinga Institute of Industrial Technology (KIIT) University, and is registered as a private (not-for-profit) company.

The current focus areas of BCKIC Foundation include:

- healthcare/Public Health
- Energy and Environment
- STEM Education
- Agritech and Nutrition
- Sustainable Livelihood

Website link: https://bckic.in/

About S & T Clusters working on STEM Education

Research and Innovation Circle of Hyderabad (RICH)

Research and Innovation Circle of Hyderabad (RICH) was launched by the Government of Telangana and is registered as a private (not-for-profit) company.

The current focus areas of RICH include:
- Food and Agriculture
- Life Sciences
- Sustainability

Website link: https://rich.telangana.gov.in/

Delhi Research Implementation and Innovation (DRIIV)

The Delhi Research Implementation and Innovation is hosted by the Indian Institute of Technology, (IIT) Delhi, and is registered as a private (not-for-profit) company.

The current focus areas of DRIIV include:
- Waste to Wealth
- Deep Tech
- Air Pollution
- Water Security
- Sustainable Mobility
- Effective Education
- Sustainable Energy
- Healthcare

Website link: https://www.driiv.co.in/

S & T Clusters in STEM Education: At a Glance

INR 11 CR Funds raised

INR 1.37 CR Funds mobilized

57 Partnerships fostered

13 Initiatives with Central and State Governments

4 States benefitted | **62** Districts benefitted

140+ Educational Institutions reached

13 STEM Education Programs implemented

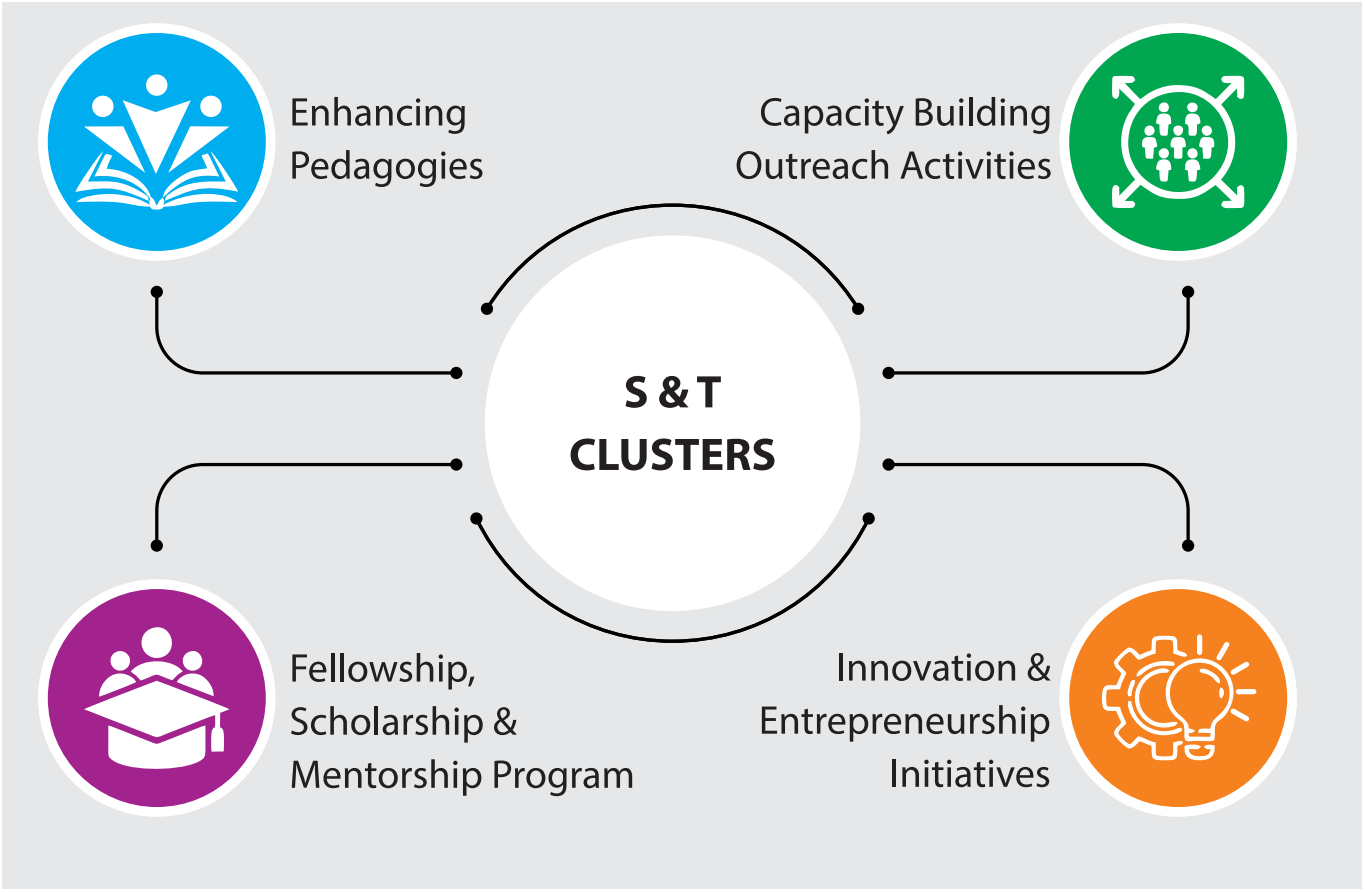
185 Capacity Building & Outreach Activities conducted

28,000+ Individual Beneficiaries

5,700+ Students benefitted | **122** Women supported

Key STEM Initiatives by the S & T Clusters

The STEM Education Initiatives implemented by the S & T Clusters are in alignment with NEP 2020, along the following focus areas:



ENHANCING PEDAGOGIES

TEACH WITH TECH

CHEM A MAZE
CREATING BONDS WITH CHEMISTRY

सत्यमेव जयते
NITI Aayog

AIM
ATAL INNOVATION MISSION

TEACH WITH TECH

"Teach with Tech" is an initiative of the ***Pune Knowledge Cluster (PKC)*** supported by ***Lenovo India*** to empower teachers with digital pedagogy skills and train students in using digital tools in classroom settings.

This program aims to enhance digital pedagogy by empowering students and teachers to use digital tools related to Science, Mathematics, and Technology for learning and teaching.

Phase I focused on developing digital content and on-ground training of teachers and students, while Phase II of the program was conducted in partnership with the Meghshala Foundation and focused on training teachers and providing tablets containing e-lessons covering broad topics in science and mathematics.

HIGHLIGHTS

1877 Total Students trained

1000 Girl Students trained

736 Teachers trained

10 Training workshops

25 Schools enabled with digital infrastructure

10 Digital modules developed

75 Lesson plans translated to regional language

BENEFICIARIES

6th to 8th-grade students and their teachers from regional and semi-English language schools

PARTNERS

Funding Partner : Lenovo India

Technology and Knowledge Partner : Meghshala Foundation

School selection: District Institute of Education and Training | Pune Zilla Parishad

Training Partner: Muktangan Exploratory | IUCAA SciPop | CS Pathshala | SPPU Science Park | DLRC Pune

PROGRAM SNIPPETS

MEDIA COVERAGE

'Teach with Tech': A STEM Education program building stem mindsets for schools in Maharashtra

TOPICS: #Lenovo #Lenovo India #Pankaj Hariai APAC Tablet Head Lenovo

#Prof. Ajit Kendekuri Principal Investigator Pune Knowledge Cluster #Pune Knowledge Cluster (PKC)

Printed from THE TIMES OF INDIA

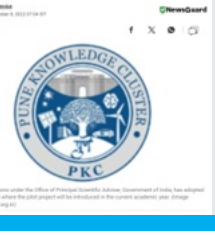
Pune Knowledge Cluster launched Teach with Tech for school students and teachers

Pune Knowledge Cluster(PKC) launched the Teach with Tech initiative on October 7, for school teachers and students for classes 6 to 9. The initiative would work on developing digital content for schools in tandem with the National Education Policy(NEP) 2020. Under the initiative, PKC would provide training to the teachers for using digital equipment, to scale up and enhance the learning process. This would help the teachers to in turn impart skills and foster critical thinking and problem-solving abilities in students. The overall aim of the initiative is to bridge the digital divide in schools and promote e-learning.

Teach with Tech has been launched in collaboration with Lenovo which will support the initiative by providing tablets to the schools chosen for pilot projects using Corporate Social Responsibility(CSR) funding. PKC has chosen and adopted 5 Pune-based schools for conducting the pilot project of Teach with Tech in the current academic year. The five schools that are included in the pilot project are Pune Vidyapeeth High School, Shri Shivaji Vidya Mandir, Modern High School, Shishu Vihar, Nutan Marathi Vidyalaya Girls High School and Baburaoji Gholap School. Though the initiative targets classes 6 to 9, at the Shishu Vihar school it will be implemented only for students of classes 6 and 7.

'Teach with Tech' launched to promote e-learning in Pune schools

The project aims to create digital content on the lines of the National Education Policy 2020, train teachers in using digital tools, develop and impart skills, critical thinking and problem-solving abilities in students, among others.



Pune Knowledge Cluster (PKC), in collaboration with, ***IIT Madras*** & ***IIT Madras Alumni Association***, has conceptualized a program called ***"ChemAmaze-A platform for Gamified Learning in Chemistry".*** The program is supported by ***BASF India Ltd***.

The program aims to implement gamification pedagogy at the school level to make classroom learning more engaging and interactive.

Besides spreading awareness of tools and techniques for enabling game-based learning in classrooms, the project also aims to build a repository of educational games mapped to the school curriculum at elementary and secondary levels.

Students will be able to test the games using a tablet and provide feedback on the improvement. This open-source repository of games will be used by schools nationwide.

A parallel objective is to train teachers to develop and design game-based tools and thus create a pool of qualified teachers (train-the-trainer approach) who will train more teachers to benefit a larger group of students.

The program was officially launched by Dr. Mrs. Parvinder Maini, Scientific Secretary, Office of PSA on 6th March 2024 in Pune.

HIGHLIGHTS

250 Students

285 Teachers

40 Games created

4 Training workshops

BENEFICIARIES

6th to 8th-grade students & their teachers

PARTNERS

Funding Partner: BASF India

Knowledge Partners:
IIT Madras | IIT Madras Alumni Association

Program Snippets

The ***Atal Tinkering Labs (ATLs)***, established nationwide, aim to empower youth with creativity, innovation, critical thinking, design thinking, social and cross-cultural collaboration, ethical leadership, etc. Aiming to identify gaps in the use of already existing ATL STEM labs in ***Delhi and Pune, DRIIV*** and ***Pune Knowledge Cluster (PKC)*** collaborated on an assessment study of ATLs.

The main objectives of the study were:

- Identification of the learning and skills gaps of teachers and orienting them towards the current activities of ATLs (both digital & offline) to assist them in their teaching process
- Designing training sessions for teachers to use pedagogy effectively while utilizing and integrating ATL activities within their curriculum
- Integrating various themes under the knowledge cluster's verticals, such as air pollution, sustainable mobility, water management, solid waste management, public health, and practical education with ATL based activities and developing innovative projects to solve the city's problems
- Mapping the activities of ATLs with the school curriculum and developing training programs and course modules for teachers to conduct experiments, projects, and activities and utilize the resources provided by ATLs & and the knowledge clusters
- Assessing the impact of the activities done through the ATL centres and providing constructive feedback to improve the functioning of the ATLs in schools
- Documentation of the resources developed during the training sessions with teachers

HIGHLIGHTS

10 ATLs at five schools each in Pune and Delhi

3 Training sessions

BENEFICIARIES

Teachers from schools with ATL (10 schools from Delhi and Pune)

PARTNERS

Knowledge Partners:
IIT Delhi
Ashoka University
NCERT
MIND CHOW
Agastya International Foundation
National Remote Sensing Centre (NRSC)
Indian Space Research Organisation (ISRO)

Advisors:
Distinguished Scientists, Shyama Prasad Mukherji College
Dr. Ketaki Bapat, O/o PSA
Prof. Geetanjali Yadav, NIPGR
Dr. Sangeeta Kasture, Department of Bio Technology

PROGRAM SNIPPETS

FELLOWSHIP, SCHOLARSHIP & MENTORSHIP PROGRAM

MEDHA

Pune Knowledge Cluster (PKC), in collaboration with, ***IIT Madras*** and ***IIT Madras Alumni Association***, has conceptualized a program called ***"ChemAmaze-A platform for Gamified Learning in Chemistry".*** The program is supported by ***BASF India Ltd***.

WEnyan is an initiative by the **PKC** and **BASF, India.**, to offer funding support, mentorship, and entrepreneurial skill development to deserving women candidates in Maharashtra.

The WEnyan project aims to support women from marginalized communities in Maharashtra to pursue research or entrepreneurship in chemistry, sustainability, and allied areas with a scholarship of INR 10,000/month for three months at the undergraduate level, INR 15,000/month for six months at the postgraduate level and a grant of INR 6.5 lakhs for entrepreneurs.

Besides financial support, the project also provides mentorship through direct mentoring and interaction with women in leadership positions in various STEM sectors. The program fosters networking opportunities and industry visits, providing the awardees with opportunities to learn more about the science and technology ecosystem, including the start-up ecosystem & and possible opportunities. The ultimate goal is to increase women's enrolment and retention in scientific streams, thus creating a more gender-equal workforce.

BENEFICIARIES

6th to 8th-grade students and their teachers from regional and semi-English language schools

PARTNERS

Funding Partner : BASF India

Selection Committee and Program Mentor:

Ms. Rupsha Chaudhari (BASF Chemicals India Pvt. Ltd.)
Dr. Sujata Deo (Institute of Science College, Nagpur)
Ms. Ritu Dhiman (BASF Chemicals India Pvt. Ltd.)
Dr. Amrita Hazra (IISER, Pune)
Dr. Prajakta Dandekar Jain (ICT, Mumbai)
Dr. Sayalee Kand (BASF Chemicals India Pvt. Ltd.)
Dr. Manisha Khaladkar (Govt. College of Engineering, Yavatmal)
Dr. Ayesha Khan (Savitribai Phule Pune University)
Ms. Smriti Khanna (BASF Chemicals India Pvt. Ltd.)
Dr. Neetu Singh (IIT Delhi)
Ms. Shilpa Korde (BASF Chemicals India Pvt. Ltd.)
Dr. Sadhana Sathaye (ICT, Mumbai)
Dr. Vaishali Kulkarni (KBCols Sciences Pvt. Ltd. Pune)
Ms. Sunita Sule (BASF Chemicals India Pvt. Ltd.)
Dr. Avinash Kumbha (SPPU, Pune)
Dr. Dilip Thube (New Arts, Commerce and Science College, Ahmednagar)
Dr. Anuya Nisal (NCL, Pune)
Dr. Shobha Waghmode (MES Abasaheb Garware College, Pune)
Dr. Mushtaq Patel (BASF Chemicals India Pvt. Ltd.)
Dr. Paul Wilson (Madras Christian College)

HIGHLIGHTS

684 Applications received

52 Awareness Sessions conducted across **32** colleges and **12** districts

49 Awardees **20** undergraduates, **21** postgraduates, & **8** doctoral

18 Colleges across **16** districts in Maharashtra

32 Mentors onboarded

110 Hours of mentoring

5 Industry visits conducted

9 Role Model Talks were conducted

4 Skill-building workshops conducted

A compendium featuring the journeys of the awardees, along with the overview and impact of the WEnyan program, was officially released on 6th March 2024 in Pune:

Link to the digital version of the compendium: https://www.pkc.org.in/wp-content/uploads/2024/03/wenyan_booklet_webversion.pdf

PROGRAM SNIPPETS

Media Coverage

Scientific Secretary, Government of India launches ChemAmaze Gamification Platform and honours WEnyan Scholarship Awardees and Mentors – A Joint Initiative by BASF and Pune Knowledge Cluster

सकाळ

लोकोपयोगी संशोधनात 'ती'ची आघाडी

सकाळ वृत्तसेवा

महिला दिन विशेष

असे झाले संशोधन

निष्कर्ष

असे झाले संशोधन

निष्कर्ष

Testimonials from Awardees

Kavita Gowda, Thane, Maharashtra | Bachelor's Scholarship 2022-23

The WEnyan program has helped widen my understanding of scientific concepts and inculcating an excellent scientific temperament through various lecture sessions and talk series. It also supports me with timely mentoring to tackle the bottlenecks I encounter while conducting my research.

Swapnali Gawas, Sindhudurg, Maharashtra | Master's Scholarship 2022-23

The support under the Wenyan program has been very helpful in finding good instruments and facilities that are not available in colleges. The mentoring provided in data collection, interpretation, and data analysis has helped me with my research.

Suvarna Jarande, Pune, Maharashtra | Entrepreneurship Scholarship 2022-23

The various engagement activities conducted by the WEnyan team help in building the necessary skills and qualities needed to be a successful researcher, entrepreneur and a good human being. With the help of this program, I am getting to learn how to plan my project well by managing my finances and experiments together

Baleshwari Shirodiye, Nagpur, Maharashtra | Bachelor's Scholarship 2023-24

The WEnyan Program is a beacon of hope for individuals like me, offering financial backing and a golden opportunity to turn dreams into reality by providing us with mentorship for our projects.

Sharvari Wagh, Nashik, Maharashtra | Master's Scholarship 2023-24

WEnyan is more than financial support. The program promises to fuel my research with resources, refine my skills with mentorship and expand my horizons with a network of passionate mentors. This scholarship will empower me to chase a sustainable future in energy research.

Dipali Ghone, Bhor, Maharashtra | Entrepreneurship Scholarship 2023-24

I appreciate all the support from WEnyan that is helping me sustain myself as a financially independent woman, especially during a challenging period of my life. WEnyan is a robust platform to take off for your entrepreneurial journey as it provides you with the required opportunities and experiences.

Testimonials from Mentors

Dr. Shobha Waghmode
Head, Department of Chemistry, MES Abasaheb Garware College, Pune

All the WEnyan applications were quite good, and with a transparent selection framework, we could select worthy candidates who were genuinely hardworking and had strong visions for themselves. Since I was also one of the program mentors, I got to witness first-hand how hardworking these girls were despite being from a small college with fewer facilities. Many of the master's scholarship awardees took their project work to later stages of production.

Much credit goes to the PKC team for getting the work extracted from these beginners in research. I am sure these awardees will do more in their future endeavours because they got a first-hand experience about the research and start-up ecosystem.

Dr. Seema Sambrani
HOD & Assistant Director, S K Somaiya College

As Neha Kuity's mentor, I could see her improve steadily during the course of this program. We started the project on a small scale and then expanded to a bigger scale for a pilot, for which she had to coordinate with several different types of vendors. Over this entire process, I could see an improvement in her communication skills, and her confidence levels also increased. WEnyan has also changed how she thinks - initially, she would think as a student or a researcher, but now she thinks from a business perspective.

One of the most significant advantages of this program is that it delivers the finances directly to the candidate, hence avoiding all the delays that may occur due to organizational processes. Lastly, thanks to this program she was able to attend the first conference of her life - WEnyan has given her a platform to express her science!

Dr. Dilip Thube
Vice-Principal, Professor and Head, Department of Chemistry and Research Center, New Arts Commerce and Science College, Partner, Ahmednagar

The first great success of WEnyan is that it reaches Maharashtra's rural, interior parts, especially the girls- who do not get many opportunities. Colleges are usually unable to support the students financially with the amount that WEnyan has provided them with.

The WEnyan team guided the students right from preparing and submitting the proposals in the correct format, which boosted their confidence. After being selected, we were able to see a lot of growth and development in the girls, and they also showed an increased interest in research.

Dr. Amrita Hazra
Associate Professor, Chemistry, IISER, Pune

My experience while interacting with the prototyping grant applicants during the interviews was very interesting! It was nice to explore the thought process behind the innovative projects that were proposed and to see that some of them had holistically thought through the project, rather than just the scientific details.

I feel that WEnyan is a one-of-a-kind program that encourages women to try out their own ideas. The application and interview processes provide them with an avenue to systematically think through the proposal, discuss it and get feedback from a variety of researchers and mentors. This unique program has the potential to bring good women entrepreneurs into the forefront.

PKC's flagship citizen science initiative - ***"One Million Galaxies"*** aims to inculcate scientific temper, by encouraging citizens to contribute towards scientific research.

Through this project enthusiastic citizens are trained by expert astronomers to identify nuanced features of the galaxy images.

The trained citizens are then provided with an intuitive user-interface to mark the features. Galaxy features thus recognized by trained citizens empower discoveries and build community connections between citizens and scientists.

It will also help with imbibing scientific temper and science education, especially among student volunteers.

Currently, over 1600 citizens have been enrolled on the platform. Citizens from all walks of life- including school students, homemakers, and senior citizens- are part of this program.

BENEFICIARIES

Citizens including students, young professionals, homemakers and seniors

PARTNERS

Funding Partner:
University of Southampton

Knowledge Partner:
Indian Institute of Astrophysics, Bangalore
Inter-University Centre for Astronomy & Astrophysics
Homi Bhabha Centre for Science Education, Mumbai

Outreach Partner:
Jyotirvidya Parisanstha Pune
Homi Bhabha Centre for Science Education, Mumbai
Khagol Vishwa, Centre for Citizen Science
Nehru Centre, Mumbai

HIGHLIGHTS

260000 Responses recorded for 3000 Galaxies (~30 GB Data).

5000+ Students reached.

1700+ Citizen scientists trained

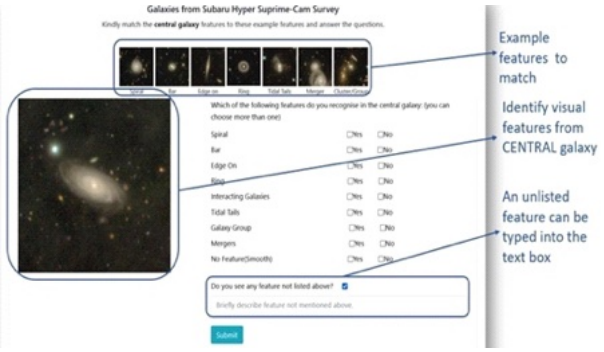
1000+ Scientists onboarded.

5 Internships supported

13 Partnerships fostered
10 National and **3** International

3 Customizable platforms built

SNIPPETS OF THE PLATFORM:



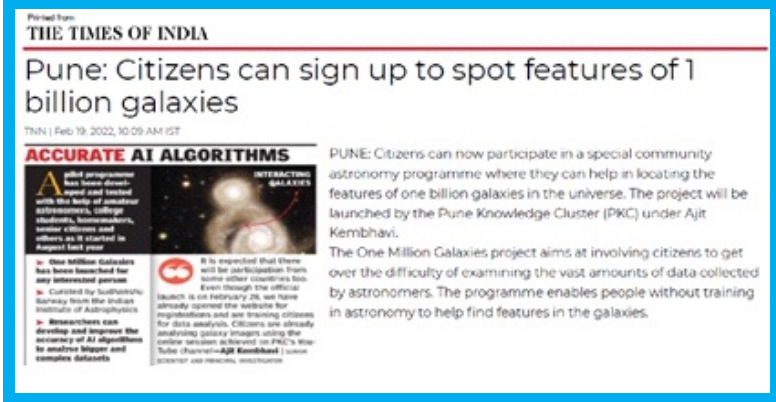
Testimonials from Citizen Scientists

Dr. Amod Rairikar (Former physician, senior citizen)
As they say, age is just a number! Even though I am 72 years old, my passion for astronomy has not faded at all. Being a part of the One Million Galaxies program has been a fantastic experience as it provides me with an avenue to keep learning new things about the galaxies and contribute towards the knowledge from the comfort of my home or wherever I am!

Ms. Chhaya Sawant (Housewife and former bank employee)
Even though I do not have any background in science, this platform provides me with an avenue to utilize my time in an innovative and sustainable manner, while also enhancing my knowledge and observation skills.

Ms. Sanvi Shanbag (Student, Lexicon International School, Pune)
Astronomy being my favourite topic, learning more about spiral galaxies through this program has been a very enjoyable and informative exercise for me!

Media Coverage


THE TIMES OF INDIA

Pune: Citizens can sign up to spot features of 1 billion galaxies

TNN | Feb 19, 2022, 10:09 AM IST

ACCURATE AI ALGORITHMS

PUNE: Citizens can now participate in a special community astronomy programme where they can help in locating the features of one billion galaxies in the universe. The project will be launched by the Pune Knowledge Cluster (PKC) under Ajit Kembhavi.

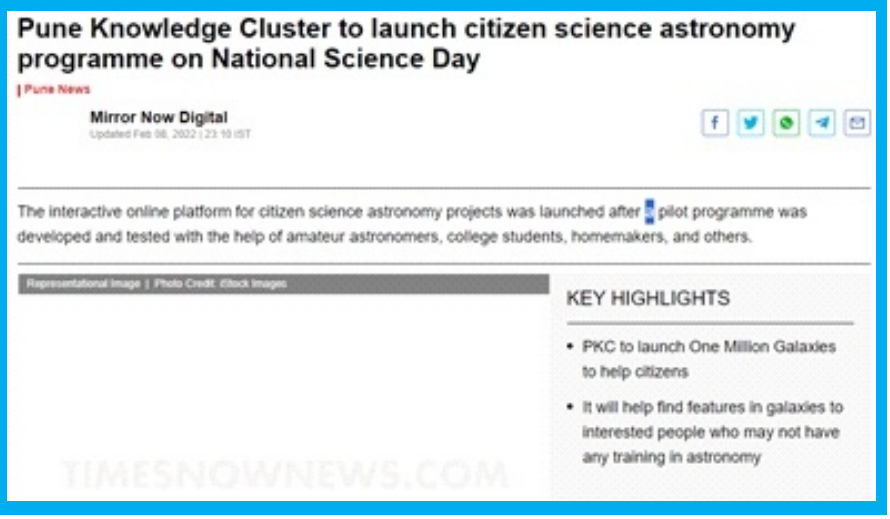
The One Million Galaxies project aims at involving citizens to get over the difficulty of examining the vast amounts of data collected by astronomers. The programme enables people without training in astronomy to help find features in the galaxies.


Pune: PKC to launch One Million Galaxies to help citizens contribute to astronomy

With committed participants, PKC hopes to produce an atlas of a million galaxies in some months.

NewsGuard


तुम्हालाही करता येणार अवकाश संशोधन


Pune Knowledge Cluster to launch citizen science astronomy programme on National Science Day

Pune News

Mirror Now Digital

The interactive online platform for citizen science astronomy projects was launched after a pilot programme was developed and tested with the help of amateur astronomers, college students, homemakers, and others.

KEY HIGHLIGHTS

- PKC to launch One Million Galaxies to help citizens
- It will help find features in galaxies to interested people who may not have any training in astronomy

MEDHA

BCKIC in collaboration with **Bayer Crop Sciences Ltd.** launched ***MEDHA*** - a unique fellowship program in December 2022 to support economically disadvantaged scholars pursuing masters and PhD in various streams of life sciences.

Through the MEDHA program, monthly fellowships of INR 20,000 are provided for 2 years for Masters students and INR 40,000 are provided for 3 years for PhD students. Besides financial support, the MEDHA fellows have professional development opportunities through industrial exposure as well as mentorship under Bayer's employees and other industry experts.

Mentorship is provided by anchoring the MEDHA fellows with eminent mentors from both academia as well as industries. Capacity building activities such as proposal writing, scientific writing, sensitization on funding opportunities, tech transfer and science-based start-ups, IPR etc. are provided to the fellows through virtual sessions.

Apart from this, BCKIC has also collaborated with DAAD to conduct a session on scope of research and study opportunities in Germany.

HIGHLIGHTS

3200+ Applications received

100 Postgraduate students supported

25 Doctoral students supported

75 Women awardees

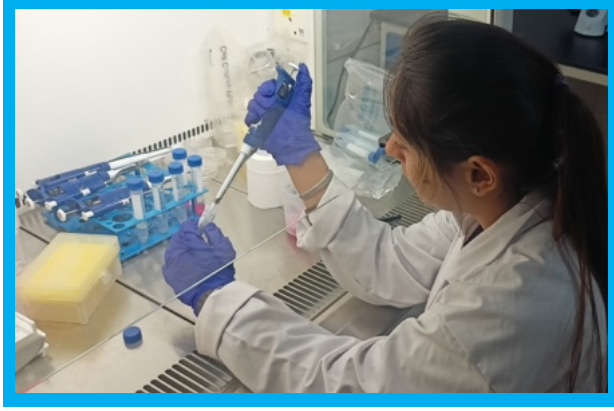
12 Divyangjan awardees

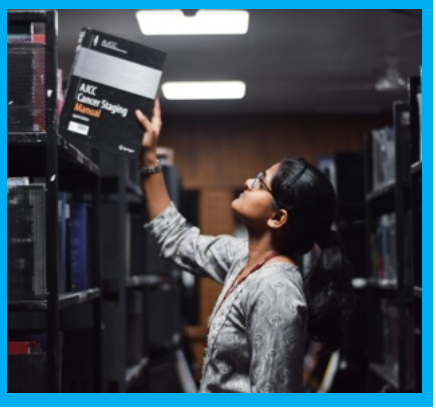
54 Mentoring hours

PARTNERS

Funding Partner: Bayer Crop Sciences Limited

PROGRAM SNIPPETS





Testimonials from Awardees

Prasanna S
Tamil Nadu Agricultural University

We feel very thankful to BCKIC for taking us throughout the fellowship tenure and still. Personally, I gained more insights from the special lectures arranged by BCKIC for research proposal writing and other meetings related to DAAD scholarship. With these valuable outcomes, I tried applying for abroad studies for my PhD.

Tanumoy Nandi
IISc Bangalore

My father's name is Tapas Nandi, he is a cultivator and my mother Rajlakshmi Nandi is a house wife. In my family there are five family members with my younger brother and grandmother. Bayer MEDHA Fellowship has helped me a lot in pursuing my higher studies. Now I'm pursuing M. Sc. in Life Science (Specialization Neuroscience) from IISC, Bangalore. My master's thesis is on "Memory and learning in C. Elegans. In my near future I'm interested to pursue PhD on these two topics. Memory and learning along with Myelination pattern. Bayer MEDHA Fellowship has helped me a lot in pursuing my higher studies.

Adyasa Samantaray
Utkal University, Bhubaneswar

I have done my schooling from Prabhujee English Medium School. After completing my UG and PG in Pharmacy from IGIPS and Utkal University respectively, I am currently pursuing my Ph.D in Pharmacology from Utkal University. Currently, I am benefitting from the Bayers fellowship for my Ph.D.

SCHOLARSHIP, MENTORSHIP AND INTERNSHIP PROGRAMME FOR WOMEN IN STEM EDUCATION AND CAREERS

The Scholarship and Mentorship Programme for Women in STEM Education and Careers was launched by RICH in November 2022 in collaboration with Syngene International Limited and Biocon Foundation.

The goal of the programme is to promote entry and retention of women in STEM, and develop a self-sustaining and educating network of women professionals from STEM.

Focusing on female students from rural or semi-urban areas across Telangana and other states, the programme provides financial assistance, internship and mentorship to those pursuing undergraduate or postgraduate degrees in disciplines such as Biotechnology, Pharmaceutical Sciences, Chemistry, and Applied Biology. A key component of the programme is its internship initiative, which offers selected students with the opportunity to gain practical experience in the laboratories of renowned research institutions and industries.

Undergraduates typically undertake 2-3 months of internship, while postgraduates engage in 5-6 months of practical training. Financial support is provided in the form of monthly stipends, with undergraduates receiving Rs. 10,000/month and postgraduates receiving Rs. 15,000/month. The programme also emphasizes mentorship. Virtual mentoring sessions conducted by subject matter experts from Syngene and Biocon offer personalized guidance to students, regardless of geographical constraints. Additionally, physical or virtual group discussions, seminars, and industry visits provide students with broader exposure and networking opportunities.

Through this multifaceted approach, the programme aims to empower women in STEM, building a diverse and inclusive ecosystem for these women students.

The first year of the programme has been successfully completed with 21 students as part of the first cohort. The programme has received funding for the second cohort and 30 candidates have been shortlisted for the same. For the second cohort, RICH has onboarded 3 more programme partners: Huwel Lifesciences, PathnSitu and 30MGenomics. RICH and its programme partners aim to extend the programme nationwide to accommodate more female STEM students in the upcoming cohorts.

Apart from this, the programme also envisions an expansion in mentor network by engaging experienced professionals, researchers and STEM leaders from different domains to provide tailored guidance to programme participants.

PARTNERS

Funding Partner: Biocon Foundation & Syngene International Ltd.

Internship Partner:

CSIR - Centre for Cellular and Molecular Biology (CCMB)
Dr. Reddy's Laboratories of Life Sciences (DRILS)
Dr. Reddy's Labs (DRL)
Bharat Biotech
Aurigene Pharmaceutical Services
Appidi Technologies Pvt. Ltd.
Huwel Lifesciences Pvt. Ltd.
30M Genomics
PathnSitu Biotechnologies

Testimonials from Awardees

Ms. Sowmya S.
Intern at DRILS

Since I was still a student, I couldn't really afford to go to a different city and do my internship for half a year. I couldn't burden my family with all the financial help that I would need to do my internship in Hyderabad. So the scholarship was one of the important factors that helped me pursue this opportunity. I know if I'd get in, I'll be able to fend for myself without asking for financial aid from anyone.

Ms. Akshita Kulshrestha
Intern at CSIR-CCMB

The mentorship support from Mr. Narasimha Reddy Dondeti and Mr. Suneelshekhar Yapara from Syngene International has been a cornerstone of my academic and career growth, offering invaluable guidance and insights that have shaped my journey in significant ways. They have enriched my academic journey by providing real-world context, skill development, networking opportunities, project guidance, career insights, and the confidence to pursue my aspirations in the STEM industry.

Ms. Sreejani Sen
Intern at Aurigene Pharmaceutical Services

The seminars were the direct one-to-one opportunities to interact with eminent dignitaries and professionals from diverse organizations. Their deep insights and profound experiences definitely guided me. They clarified my doubts in case I had one. They entertained all our doubts and it would otherwise be impossible to interact with such eminent persons without this initiative of RICH.

Ms. Hafsa Anam
Intern at DRILS

Being a part of this programme has really shaped how I approach my academic studies and think about my future career. One big thing is the problem-solving skills I've picked up. I've learned how to break down complex issues into manageable parts, which has been a game-changer. The hands-on experience in this programme has given me a taste of what it's really like out there. I've realized that it's not just about knowing stuff; it's about applying what you know to real situations.

Testimonials from Mentors

Mr. Varun Ahuja
Head - Toxicology, Syngene

I think that mentorship programme had a powerful impact on the academic and professional development as they used to get new ideas during the course of discussion. It's incredible to see their passion and determination, and I'm happy to be a part of their journey.

Mr. Md Merajuddin
Principal Investigator, Syngene

The mentorship programme was good. We discussed career development, presentation skills and future opportunities. It helps the mentees to know where and how to proceed in their career. As a mentor, I was committed to nurturing their talents and guiding them towards success.

EARTH WATCH FELLOWSHIP PROGRAM FOR EDUCATORS & STUDENTS

Earth Watch Institute India is a science - based conservation institution with educational projects grounded in science and rooted in nature to generate knowledge and contribute solutions. The institute engages with young scientists and educators through fellowship programs to promote innovative ideas for scientific research, education, skill development, and social entrepreneurship skills and training.

The program offers two main fellowship opportunities for educators passionate about conservation & environmental issues, excited to learn hands - on research techniques from top scientists, and eager to share their experiences in the field with their students and communities back home.

HIGHLIGHTS

100+ Applications received

25 Fellowships granted

INR 25 Lakh Funds mobilized

INR 1 Lakh Fellowship grant for 12 months

INNOVATION & ENTREPRENEURSHIP INITIATIVES

INTELLECTUAL PROPERTY RIGHT (IPR) AWARENESS & FACILITATION DRIVE

BCKIC has partnered with the **Science and Technology Department of the Government of Odisha** to strengthen the IPR ecosystem in the state of Odisha and promote and protect innovation and creativity. BCKIC conducted awareness sessions, training programs, and one Odisha State-level open discussion as part of this initiative. Through these awareness workshops and training programs, the distant educational institutions of Odisha and North East have been reached. These sessions were designed to familiarize the participants with the terminologies and the basic concept of Intellectual property.

HIGHLIGHTS

1200+ Individual beneficiaries

900+ Scholars reached

18 Institutes reached

100 Innovations scouted

12 Patents filed

BENEFICIARIES

Students, academicians, entrepreneurs

PARTNERS

Knowledge Partner: Science and Technology Department, Government of Odisha

PROGRAM SNIPPETS

Details of the sessions conducted:

In-person sessions:

Name of Institution	Date	No. of participants
Rama Devi Women's University, Odisha	17th February 2023	98
Utkal University, Odisha	17th February 2023	69
Behrampur University, Odisha	21st February 2023 4th – 5th May 2023	140 180
Rajendra University, Odisha	13th March 2023	180
Kalahandi University, Odisha	14th March 2023	88
KIIT deemed-to-be University, Odisha	21st – 22nd March 2023	250
Law colleges of the state - Open discussion	29th April 2023	75
Manipur Technology Innovation Hub (MTI-HUB), Imphal	30th November 2023	51
University of Science and Technology Meghalaya (USTM), Meghalaya	30th September 2023	112
Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir (SKUAST), Jammu & Kashmir	18th December 2023	48

Online sessions:

Name of session	Date
IPR Workshop/Mentorship for KIIT-TBI DST-Supported Innovators	15th November 2023
IPR Workshop/Mentorship for KIIT-TBI MeitY-Supported Innovators	17th November 2023
IPR Workshop/Mentorship for BRTC A BIRAC KIIT-TBI	3rd and 6th November 2023
IPR Workshop/Mentorship for BIRAC-BIG Innovators	5th and 6th September 2023

OPEN: ODISHA PITCHING CUM ENTREPRENEURSHIP BOOT CAMP

OPEN (Odisha Pitching cum Entrepreneurship) Boot Camp, supported by **Science & Technology Department, Government of Odisha** is a 60-day entrepreneurship boot camp program by the **BCKIC Foundation** in association with **KIIT-Technology Business Incubator and Science & Technology Department, Government of Odisha** as well as ecosystem partners, Global Network of Entrepreneurs and Professionals for Odisha & Carleton University Innovation Hub.

The boot camp aims to spread awareness about entrepreneurship opportunities, discover bright innovative ideas from multiple colleges/ universities in Odisha and provide access to incubation support, mentorship and funding opportunities for the idea-to-proof-of-concept building. Under this boot camp, an outreach program covering 15 cities in 13 districts of the state was also undertaken to scout innovative ideas from innovators across Odisha.

BENEFICIARIES

Innovators, start-ups, students

PARTNERS

Knowledge Partner:
Science and Technology Department, Government of Odisha

Knowledge and Implementation Partner:
KIIT-Technology Business Incubator

Ecosystem/Outreach Partner:
Global Network of Entrepreneurs and Professionals for Odisha | Carleton University Innovation Hub

HIGHLIGHTS

1500+ Young Innovators reached

345 Innovative ideas received, **50** shortlisted.

15 Innovators selected for attending the boot camp for intensive strategic mentoring. All 15 innovators received 6-months of incubation support from KIIT-Technology Business Incubator.

5 Top innovations selected and awarded at the Grand Finale

Program Snippets

EDUCONCLAVE: SHARING BEST PRACTICES IN STEM

PKC hosted a one-day conference - ***EduConclave,*** aiming to bring together educators, thought leaders and experts in the field of STEM Education.

The conference hosted interesting discussions on:
- Successful Practices and latest trends in STEM Education
- Effective STEM pedagogy
- Latest innovations in the STEM Education sector
- Ongoing dialogue on shaping the future of education in India

The inaugural session raised points about the current status of STEM Education – and the role of the government, academia as well as private sector in driving changes, which was followed by a panel discussion on: Perspectives on setting up and running STEM Tinkering Labs.

The panel discussion was followed by a hands-on STEM workshop, facilitated by the team of Agastya Foundation, and a showcase of NGOs and start-ups working in the EdTech and STEM Education space.

The conference concluded with a poster presentation and networking session, where the attendees got an opportunity to interact with each other, to develop possible future collaborations.

Key takeaways from the conference included:
- Need of having a 'heads-on', 'hands-on' and 'hearts-on' approach, which not only provides students with a vocational exposure, but also inculcates empathy within them
- Need of working together with teachers to reduce their physical as well as mental load and facilitating a peer-learning atmosphere for empowering them with the knowledge required for running a tinkering lab in school
- Creating a holistic learning atmosphere through which students can make as well as learn from their own mistakes
- Fostering communities of parents and teachers to improve the learning experience of students

The conference showcased a need to work in the collaborative manner in order to drive progress in the STEM education sector in Pune and was a step towards creating a unique ecosystem for it.

HIGHLIGHTS

15 Organizations from Pune and Mumbai showcased innovative tools and pedagogies in STEM Education

PROGRAM SNIPPETS

MEDIA COVERAGE

Pune

Pune Knowledge Cluster Hosts EduConclave, Setting the Stage for STEM Advancements

2 months ago

CAPACITY BUILDING & OUTREACH ACTIVITIES

The four clusters PKC, DRIIV, RICH and BCKIC have collaborated with multiple start-ups, industries, academia, government bodies and other associations for arranging diverse activities like conferences, seminars, workshops, courses, training programs, bootcamps, and hackathons, with an aim of building the capacity of teachers, students, citizens, innovators, scientists and researchers on diverse topics in STEM.

Selected Capacity Building Activities by DRIIV

STEM IGNITE CAMP

"STEM Ignite Camp" a two-day event was conducted by **DRIIV** in Patel Nagar, Delhi by **S. D. Public School** on the 28th and 29th of August 2023. The overarching aim of the event was to instil a passion for STEM in school girls through hands-on experiments, engaging interactions with experts, and enlightening them about the diverse career opportunities in sciences. The workshop also encouraged girls to tackle challenges and obstacles in their pursuit of STEM education. It also helped in providing insights into various career opportunities related to STEM.

Objectives of the camp include:

- To make young girls, parents, and teachers aware about the STEM
- To make them understand how STEM can be pursued through fun and passion
- To deliberate upon the STEM-related subjects and career

HIGHLIGHTS

200 Girl students reached

1 Interactive sessions with psychologists conducted

1 Panel Discussion conducted

BENEFICIARIES

Girl students from 6 schools

PARTNERS

S. D. Public School | University of Delhi | IIT Delhi | Ashoka University | S. P. M College | NCERT | NIPGR | MIND CHOW | Agastya International | Department of Biotechnology | National Remote Sensing Centre (NRSC)

PROGRAM SNIPPETS

WORKSHOP ON 'MAKING EDUCATION AI/ML READY' FOR EDUCATORS

A series of online workshops were held to provide core approaches for AI and big data research. The courses were completely cloud-based, and teachers were exposed to the concepts of machine learning, R-platform, and data plotting. Over 40 school instructors were trained in basic AI/ML so that they could create AI/ML-integrated lesson plans.

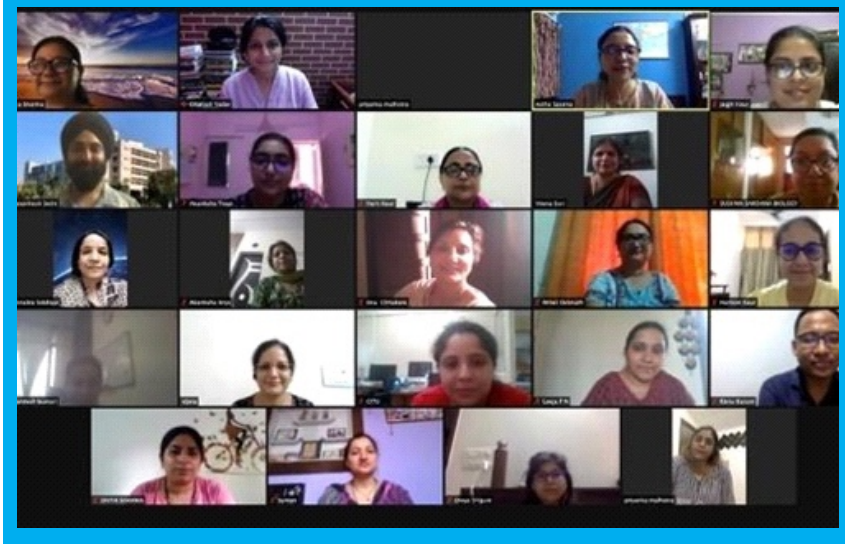
Objectives of the workshop included:

- Developing a network of trainers to build capacity in India
- Enabling opportunities to interact with global AI specialists

HIGHLIGHTS

Over 40 school instructors were trained in basic AI/ML so that they could create AI/ML-integrated lesson plans.

PROGRAM SNIPPETS



INNOVATION & ENTREPRENEURSHIP

A seminar on efficient utilization of the Public-Private-Partnership (PPP) model to foster innovation within the higher education sector was organized. The event provided valuable insights and practical strategies for utilizing PPP models to drive positive and impactful change within the academic sphere. Dr. Jitendra Singh, Hon'ble Union Minister of State (Ind. Charge) Science & Technology, stated during the Inaugural Session that NEP 2020 accommodates the aspirations of potential start-ups at all stages of growth.

BENEFICIARIES

Public-private partnership refers to a collaborative venture between a government organization and a private-sector corporation.

PROGRAM SNIPPETS

MEDIA COVERAGE

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr Jitendra Singh said here today that the National Education Policy 2020 offers enabling opportunities to aspiring StartUps.

Addressing the Inaugural Session of the 5- National Seminar on "Innovation In Education Through Public-Private-Partnership (PPP) Model in Higher Education" at Cluster Innovation Centre (CIC), Delhi University, Dr Jitendra Singh said that NEP 2020 accommodates the aspirations of potential StartUps at various stages of their growth. The new avenues of StarUp initiatives should be determined based on the requirements of the Industry and the market dynamics to make them sustainable, he said..

Selected Capacity Building Activities by PKC

STEM TEACHER TRAINING WORKSHOPS

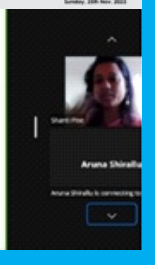
Through the Teacher Training Workshops, **PKC** aims to train teachers to use technology-oriented methods for teaching and learning, that are creative, inquiry-based, hands-on and value-building.

HIGHLIGHTS

13 Workshops conducted

980 Beneficiaries

PROGRAM SNIPPETS



INTERDISCIPLINARY TRAINING PROGRAMS AND COURSES

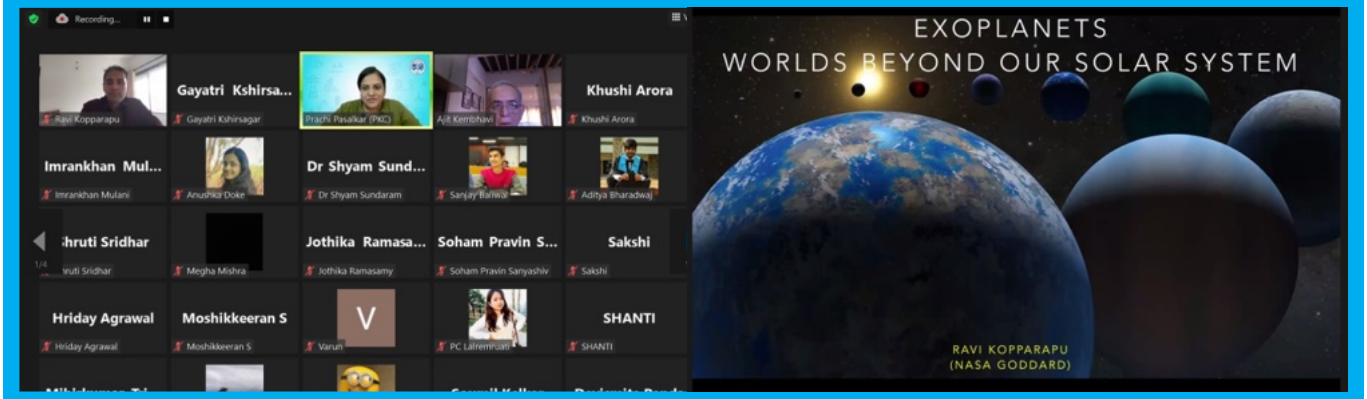
PKC in collaboration with diverse stakeholders conducts workshops, courses and training programs with an aim to empower students, young researchers and working professionals with employability skills pertaining to Industry, academia, entrepreneurship.

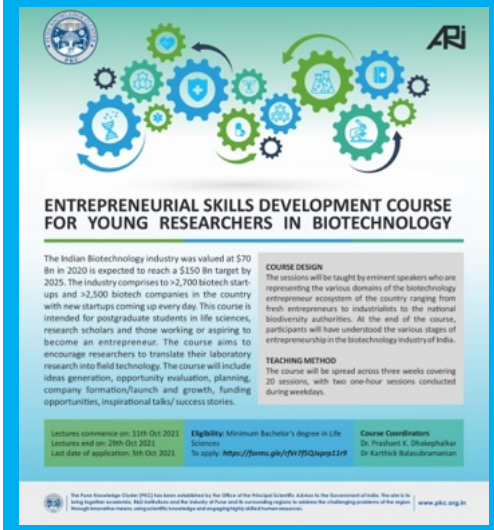
HIGHLIGHTS

14 Courses & Workshops conducted

773 Beneficiaries

PROGRAM SNIPPETS





CITIZEN-CENTRIC TALKS

PKC's Citizen Centric Talks are aimed towards inculcating scientific temperament and empowering citizens with information on important topics in STEM, including cutting edge science and technological advancements in the country, data science, sustainability and environment, and health.

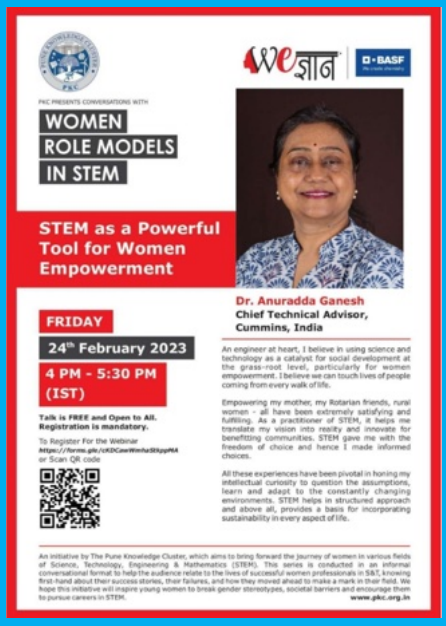
HIGHLIGHTS

110 Talks conducted

9171 Beneficiaries

They are held online in order to ensure nation-wide participation and are accessible on our YouTube channel: ***https://www.youtube.com/@PuneKnowledgeCluster***

PROGRAM SNIPPETS



LEAD: Learn | Explore | Access | Discover

PKC's flagship program – LEAD: Learn | Explore | Access | Discover, provides vocational exposure and networking opportunities within the Science and Technology Ecosystem in Pune region, through study tours, field visits and interactions with experts from diverse knowledge-driven sectors.

HIGHLIGHTS

4 Industry visits conducted

194 Beneficiaries

VISIT SNIPPETS

CoData Conference and Digital Twin Roundtables

PKC hosted a conference on Open and FAIR Data Ecosystem to address important issues in data science relevant to open science and open data. Discussions at the conference focused on identifying aspects of Data Science that could leverage the rapidly evolving digital ecosystem and understanding existing challenges in areas such as: National Health, Agri-Tech, Ocean & Atmospheric Science, Digital Humanities.

HIGHLIGHTS

140 Beneficiaries

CONFERENCE SNIPPETS

DIGITAL TWIN ROUNDTABLES

PKC has hosted two digital twin roundtables to promote discussions on emerging digital twin technologies and their varied applications in the Indian context.

HIGHLIGHTS

80 Beneficiaries

ROUNDTABLES SNIPPETS

BCKIC
Bhubaneswar City Knowledge Innovation Cluster Foundation

Selected Capacity Building Activities by BCKIC

VIGYAN SARVATRA PUJYATE - *National Science Week Festival 2022*

As a part of Azadi Ka Amrit Mahotsav, a week-long celebration themed as Vigyan Sarvatra Pujyate, took place during 22 - 28 February 2022 at 75 locations in India. Ministry of Culture, Government of India, Office of the Principal Scientific Officer to the Government of India, and Vigyan Prasar jointly organized the national events that were supported by DST, DBT, CSIR, MoEs, DAE, DOS, ICMR, AICTE, and DRDO.

HIGHLIGHTS

12,400+ Beneficiaries

25+ Events conducted

35+ Speakers

A celebration of the event took place in Bhubaneswar under the aegis and with the excellent support of the S&T Department, Government of Odisha, organized by Odisha Bigyan Academy, BCKIC, KIIT University, and Regional Science Centre of Bhubaneswar. KIIT International School hosted a week-long extensive science expo.

The festival featured world-class researchers, scientists, and technocrats in a variety of talks, panel discussions as well as expositions. A series of competitions for students were organized including essay writing, poetry, debate, drama, and poster making. In addition, students presented their ideas, inventions, and science projects focused on societal and industrial benefits.

PROGRAM SNIPPETS

ENGAGEMENT WITH ROYAL SOCIETY OF CHEMISTRY: PROMOTING STEM ACTIVITIES

a. Roundtable Discussion with Eminent Women (13th October 2022):

BCKIC Foundation along with the Royal Society of Chemistry (RSC), organized a round table discussion with eminent women scientists in Chemistry.

HIGHLIGHTS

37 Abstracts submitted

200+ Beneficiaries

The interactive session pivoted around strengthening the dialogue and actions in chemical sciences. Furthermore, the discussion aimed at understanding the key pain points of women leaders in STEM and thereby, incorporating policy-level initiatives to mitigate the issues.

b. Scientific Symposium on Health and Wellbeing (31st January 2023):

The Royal Society of Chemistry along with BCKIC Foundation and KIIT University, Bhubaneswar organized a scientific symposium on health and wellbeing.

The symposium highlighted the role of chemical sciences on Health and Wellbeing and explored research collaborations between the UK and India.

CONFERENCE SNIPPETS

WORKSHOP ON INDIAN SCIENCE TECHNOLOGY AND ENGINEERING FACILITIES MAP (I-STEM): LINKING RESEARCHERS AND RESOURCES

In collaboration with the Odisha Science and Technology Department, BCKIC organized a sensitization workshop on "Indian Science Technology and Engineering facilities Map (ISTEM): Linking Researchers and Resources" to provide detailed insights into the initiative and demonstration of the I-STEM portal.

CYBER SAFETY WORKSHOPS FOR WOMEN AND CHILDREN

BCKIC in association with Red Dot Foundation conducted a series of workshops in the state with special emphasis on cyber security for women on 30th March 2022. The project is supported by the U.S. embassy, in India and the U.S. Consulate General, in Hyderabad. Workshops were held at Utkal University, Kalinga Institute of Social Sciences, Rama Devi Women's University as well as KIIT University.

HIGHLIGHTS

4 Institutions reached

170 Beneficiaries

ONLINE CERTIFICATION COURSE - NEXT GENERATION SEQUENCING AND DATA ANALYSIS ON COVID-19 SEQUENCING

BCKIC with the support of KIIT-TBI, Jeju National University, and Premas Life Sciences, organized an online certification course on, "Next Generation Sequencing (NGS) and Data Analysis on COVID-19" on 29th June 2023.

HIGHLIGHTS

150 Beneficiaries

This workshop focused on the importance of NGS in the biomedical field, which was further necessitated by the advent of different strains of COVID-19, which shall require a wide range of resource pools that understand the NGSs and their adaptation in deciphering the ever-changing viral genome. More than 150 participants were trained on the basics of NGS and COVID genome sequencing.

MAKE IN ODISHA CONCLAVE 2022

Make in Odisha Conclave held from 30th November to 4th December 2022 was the flagship investor summit of the Government of Odisha at Bhubaneswar. The conclave showcased Odisha as the preferred destination for investment across sectors.

The conclave also provided a unique opportunity to understand Odisha's policy and regulatory environment, and the vast existing and emerging business opportunities across sectors.

BCKIC Foundation collaborated with Science and Technology Department, Govt. of Odisha as knowledge partner for the flagship 'Make in Odisha Conclave' 2022. To support the knowledge driven economy, the BCKIC and S&T Department focused on showcasing the growth of the Biotech sector in the state. The following engagement activities were conducted- roundtable discussions, MoU exchanges, Startup Showcase, Panel Discussions, Keynote Sessions, Product Launches.

HIGHLIGHTS

250+ Beneficiaries

20+ Start-up Showcases

5 MoUs exchanged

INR 1.25 CR Investment committed for ecosystem development

PROGRAM SNIPPETS

WORLD ENTREPRENEURS' DAY: SPARK-O-THON

In celebration of **World Entrepreneurs Day**, the Bhubaneswar City Knowledge Innovation Cluster (BCKIC) Foundation, in partnership with FICCI FLO Bhubaneswar Chapter hosted an event ***"Spark-O-Thon"*** on 21st August 2023., dedicated to nurture innovation and entrepreneurship among students, showing an inventive potential of the next generation.

The event witnessed compelling motivational talks by mentors from the startup ecosystem, an Idea Pitching Competition, and an interactive Entrepreneurship Quiz.

World Entrepreneurship Day was celebrated across schools and colleges in Bhubaneswar, uniting prominent institutions including CIPET, BGU, KIIT, KIIT International School, KISS, Bose Polytechnic, DAV Public School, SAI International School, ODM Public School, and ODM Global School.

HIGHLIGHTS

10 Institutions reached

3000+ Student Innovators reached

150+ Ideas pitched

30 Ideas shortlisted for further support

IMPACT AND MAJOR ACHIEVEMENTS

Following their inception in 2020, the four S&T Clusters based in Bhubaneswar (BCKIC), Delhi (DRIIV), Hyderabad (RICH), and Pune (PKC) have undertaken several regional STEM-related projects and activities in the last four years in alignment with the mandates of the NEP 2020.

These include 13 long-term STEM Education Programs and 185 Capacity Building & Outreach Activities that benefited over 28,000 Individual Beneficiaries and strengthened the regional educational, research, and innovation ecosystems.

Among these, 13 initiatives were carried out with the Central and State Governments. Along the way, the clusters have built 57 partnerships with external organizations and raised over 11 CR in funding. Cluster endeavours have reached more than 140 educational institutions across 62 districts in the four States and the efforts have received huge appreciation from the beneficiaries.

The impact has often crossed regional boundaries and the experience has helped the clusters to understand the current gaps in the system requiring attention in their respective regions. The experiences garnered, the networks established, and the successful projects themselves have laid a promising foundation for future initiatives across the nation.

Programs for enhancing pedagogies:

- PKC's **'Teach With Tech'** program in collaboration with Lenovo India and several training partners created 10 digital STEM modules for 6th to 9th standard students and enabled 25 schools in Pune with digital infrastructure, thus reaching 1877 students and 736 teachers. In addition, 75 Lesson plans have been translated into the regional language.

- PKC's **'ChemAmaze'** program in collaboration with BASF, India and IIT Madras to implement game-based learning in chemistry at the 6th to 8th grade level. It has created an open-source repository of 40 educational games mapped to the school curriculum that could be used nationwide. The training and validation workshops involved 250 students and 285 teachers from schools in Pune.

- **Strengthening the use of Atal Tinkering Labs** (ATL) in schools has been a joint venture of PKC and DRIIV. The pilot study in this direction has executed 3 training sessions for ATL in-charges/teachers from 10 schools (5 each from Delhi and Pune) were conducted to enable the teachers to integrate the ATL activities within the curriculum.

Fellowship, scholarship, and mentorship programs for students and educators:

- The **'WEnyan Scholarship & Mentorship Program for Women in Chemistry'** by PKC awarded 49 scholarships within the last two years, to Bachelor's and Master's girl students and women

entrepreneurs in chemistry and sustainability, spanning across 18 colleges in 16 districts in Maharashtra. Besides financial assistance, mentoring (32 mentors onboarded) and industry visits were part of the programme, which has resulted in onboarding of 32 mentors. The notable achievements by the awardees include the filing of patents (3), publishing research articles (3), conference presentations (4) etc and 6 awardees have already been recruited by the industry. This program achieved State-wide recognition and built a network of colleges and professionals enthusiastic about getting involved with this initiative.

- The **'Scholarship, Mentorship and Internship Programme for Women in STEM Education and Careers'** by RICH in collaboration with Syngene International Limited and Biocon Foundation has awarded 21 scholarships within the first year, to Bachelor's and Master's girl students from rural or semi-urban areas of Telangana and various other states. This program involved 85 Colleges/Universities/institutions and onboarded 21 mentors. Among the awardees, 4 Students gained internships in paired institutes/industries, 10 Students got admitted to higher education and 6 got placements in R&D institutions/industry.

- **'MEDHA',** a fellowship programme by BCKIC, in collaboration with Bayer Crop Sciences Limited received over 3200 applications from all over the country and awarded 100 fellowships for three years at the postgraduate level and 25 at the doctoral level in life sciences, biotechnology, and pharma discipline. This fellowship also arranges industry visits and mentoring sessions for the fellows.

- The **'Earth Watch Fellowship Program'** for Educators & Students is an initiative of DRIIV in collaboration with Earth Watch Institute India. From over 100 applications received, 25 fellowships for 12 months have been awarded to young scientists and educators who are passionate about conservation and environmental issues.

- The **'Citizen Science Program: One Million Galaxies'** of PKC has onboarded more than 1000 scientists and trained over 1700 citizen scientists to identify nuanced features of the galaxy images. This initiative has provided 5 internships and has built 3 customizable platforms. Approximately 26000 Responses have been recorded so far for 3000 Galaxies (~30 GB Data).

Innovation & Entrepreneurship Initiatives:

- 17 IPR awareness and facilitation activities comprising awareness sessions, training programs and open discussions, benefitting over 1200 individuals and 900 scholars from 18 distant educational institutions of the state of Odisha and North East have been carried out. Additionally, it has resulted in the scouting of 100 innovations and the filing of 12 patents.

- BCKIC's **'OPEN (Odisha Pitching cum Entrepreneurship) Boot Camp',** has reached over 1500 young innovators across 15 cities in 13 districts of the State. The top five innovative ideas selected will be provided with an access to six months of incubation support, mentorship and funding

opportunities for getting from idea-to-proof-of-concept building.

- PKC's one-day conference **'EduConclave'** brought together educators, thought leaders and experts across India, in which 15 organizations including startups showcased innovative tools and pedagogies in STEM Education.

Capacity Building and Outreach Activities:

Over the last four years, a total of **185** diverse activities like conferences, seminars, workshops, courses, training programs, boot camps, and hackathons have been arranged by the clusters in collaboration with external partners to build the capacity and develop a network of educators, innovators, citizen scientists in the respective regions, which have benefited over **28,000 individuals** across **four states**.

Capacity Building activities conducted by the Delhi at the school level, have focused on providing hands-on STEM training as well as developing a network of capable educators who can incorporate AI/ML into their pedagogies. These activities have reached 6 schools across Delhi-NCR, benefitting 200 girl students and 40 school instructors.

PKC's STEM Teacher training workshops, which focused on training teachers to use technology-oriented methods for teaching and learning, have benefited 980 individuals across Pune. The interdisciplinary training workshops which are aimed towards empowering students, young researchers and working professionals with employability skills relevant to Industry, academia, and entrepreneurship have benefited over 773 participants across India. PKC's online citizen-centric talks, which invite participation of individuals across the country, have benefited more than 9000 individuals. PKC's flagship initiative - LEAD: Learn | Explore | Access | Discover, which enables vocational exposure and networking opportunities within the Science and Technology Ecosystem in Pune region, has resulted in 4 industry visits and benefited 194 individuals over the past one year. Apart from this, PKC has also hosted conferences and roundtables for discussions revolving around Open Data and Digital Twin, benefitting over 200 individuals.

Through events conducted on special days such as Spark-o-Thon on World Entrepreneurs' Day and Vigyan Sarvatra Pujyate - National Science Week Festival 2022, BCKIC has managed to provide a platform to schools, colleges and universities across Bhubaneswar, for presenting ideas, inventions, and science projects focused on societal and industrial benefits. These events have reached more than 12000 individuals, 10 schools and colleges across Bhubaneswar, and 3000 student innovators. More than 150 ideas were pitched, out of which 30 have been selected for further support. Through roundtable discussions and symposiums, BCKIC has brought together more than eminent women scientists in chemistry, and explored opportunities for collaborative research in the UK and India. BCKIC's 5-day long investor summit- Make in Odisha conclave, in collaboration with the Government of Odisha brought together 20 start-ups, resulting in the exchange of 5 MoUs and attracted over 250 participants. Apart from this, BCKIC has also conducted skill-building and cyber safety workshops benefitting over 300 individuals.

WAY FORWARD

The S&T Clusters were established by the O/o PSA on the recommendation of the Prime Minister's Science, Technology and Innovation Advisory Council in 2020 to act as the hub of regional collaboration between the public and private institutions and organizations. A general absence of collaborative culture in the existing public educational ecosystem was one of the concerns noted by the Council.

The S&T Clusters thus structured STEM initiatives guided by the vision and principles of NEP 2020 to enhance current pedagogy, enable inclusive education, build capacity, and nurture critical thinking and innovative spirit among the youth. Through diverse initiatives, the Clusters also brought together citizens, innovators, experts, regional academic institutions, industry and government to discuss, exchange, explore and collaborate in solving regional shortcomings and thus develop a vibrant scientifically oriented collaborative ecosystem.

The eventful journey over the last four years has also been a period of experimentation and explorations for the Clusters with different stakeholders in understanding the needs, scope and possibilities in the respective region's STEM landscape. This groundwork will pave the way for future initiatives. Besides achieving regional recognition and trust, the clusters have built a strong network of experts, organizations (national and international) and enthusiastic partners which will be carried forward in future initiatives and continuing the existing ones. The Clusters also look forward to further inter-cluster collaborations as well as partnerships with external stakeholders to achieve a wider impact in upcoming endeavours.

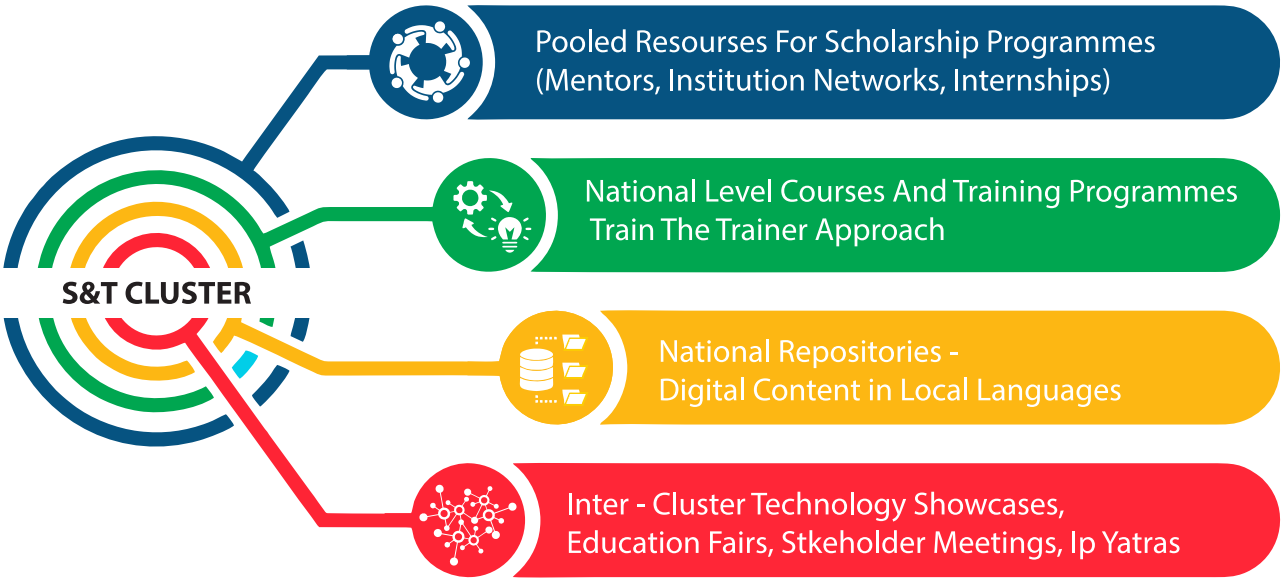
BCKIC in partnership with Bayer Foundation India are working towards the capacity building of the MEDHA fellows. Recently, BCKIC has collaborated with DAAD to conduct training programs focussed on grant writing, scientific communication, IPR, research scopes for the students in Germany, etc. Furthermore, BCKIC also aims to engage anchor mentors for each scholar to monitor their progress and handhold them for future ambitions.

DRIIV plans to extend and scale up its STEM Ignite Program and Digital Pedagogy workshop series and hold follow-up workshops in the Sustainable Air Quality series. DRIIV plans to begin two new programs for school students - a Foundational Literacy and Numeracy Program and a Mentor-Mentee Program. Some other upcoming initiatives include upgrading the ATL labs, teachers' capacity building and community programs for developing sustainability skills regarding climate change and public health. DRIIV's plan also includes initiating certificate programs for college students in partnership with universities in Delhi NCR in multiple areas viz. Data Literacy, AI/ML, Soft Skills, Personality Development, Mental Wellness, Academic Writing, Public Speaking, Public Health, and Entrepreneurship. A short-term faculty development program in Data Science, AI-enabled pedagogy, Academic Leadership, and Interdisciplinary Research is also part of this agenda.

Among the successful long-term STEM programs, PKC's WEnyan in collaboration with BASF, India will award a fresh cohort of 30 students in 2024. The scholarship and mentorship program by RICH, in collaboration with Syngene International and Biocon Foundation will begin its second round awarding 30 candidates in 2024. RICH aims to extend the coverage of this program for young women from diverse backgrounds across India. By expanding its partnerships with institutions and industry, RICH intends to provide scholarship awardees with a wider range of internship projects to enhance their research and development exposure. The plan also includes expanding the mentorship network by engaging experienced professionals, researchers, and STEM leaders from different domains to provide tailored guidance to program participants.

In their effort to strengthen the utilization of ATLs in the public schools in Delhi and Pune, PKC and DRIIV are already working together and have successfully completed the pilot study with 5 schools each in Delhi and Pune. Similar inter-cluster collaboration will be useful specially to go beyond regional boundaries to implement the goals of NEP 2020 nationwide by building national-level courses and training programs, national repositories of digital educational content in local languages and expanding the scale and scope of other outreach activities. This will also be a prerequisite for arranging inter-cluster technology showcases, education fairs, stakeholder meetings, IP yatras etc to maximise the impact.

Besides leveraging the strength of individual Clusters in developing and diversifying future programs, a collaborative approach will help pool resources like networks, institutions, mentors and other experts, overcome every unprecedented challenge on the way and thus maximise the concept of Clusters in transforming the national STEM landscape.



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