Understanding Innovation Club Framework in Education

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ABSTRACT

In the era of fast paced technology and creativity, it is necessary that we should have enough resources for the growth and development of youth of the country. The youth of the country and the educational system plays a vital role in every step of shaping the innovation ecosystem in India. Dr. Mohit Gambhir , Director of Innovation Cell, Ministry of Education, Govt. of India sensitize " NAVACHAR" means Innovation, the vernacular innovation program (VIP), to the accomplish dream of Prime Minister Shri Narendra Modi in establishing " Make in India" movement which will motivate innovators and entrepreneurs in Gujarat using their local language to solve problems for society. To provide opportunity to the students of non-technical education i.e. Arts, Commerce and Science students to showcase their ideas in innovative ways, The Higher Education Department of Gujarat has started 'The Innovation Club'. Implementation of innovation club will improve the interest of students of Gujarat state towards research, innovation and start-ups. 483 Innovation club is being set up in Government Colleges, Grantee-in-Aid Colleges and Gram Vidhyapith to make this idea of innovation in Higher Education Department of Gujarat, where talented students will get valuable opportunities.Total 854989 Students of 110 Government colleges and 358 Grant-in Aid colleges, 13 GramVidhyapith,14 Universities were members of Innovation Club in all 33 districtsof Gujarat states. Innovation in education can only transform the educational system if it is widely accepted by the students, teachers, administrators, communities, and any stakeholders related to the educational system. Total 496 Institutes, 992 Faculty members and 4960 Students actively participated in online Basics of Vernacular Innovation Training. Implementation of Prabodh level Training is going on as per the schedule given by Innovation Cell, Higher Education Department of Gujarat. Innovation club concepts can only transform the educational system if they are widely accepted by all stakeholders like students, teachers, professors, coordinators,administrators, communities of the Education system.

KEYWORDS: Innovation Club -Vernacular-Navachar- Start-up-Amrut Navsarjan -DIY kits- Boot Camp- STEM - Block Coding

INTRODUCTION

Our Prime Minister said that freedom struggle, and ideas, achievements, actions and resolve at 75, have been decided as the five pillars to celebrate 75 years of Independence. Firstly, in view of the present initiatives of the Government of India like Make in India, Start-up India, Digital India etc., the role of the education sector becomes more important to harness the creative potential of the large young population of the country. Secondly, NEP 2020 (11.2) also suggested that (STEM) have consistently showed positive learning outcomes, including increased creativity and innovation, critical thinking and higher-order thinking capacities, problem-solving abilities, teamwork, communication skills, more in-depth learning and mastery of curricula across fields, increases in social and moral awareness, etc., besides general engagement and enjoyment of learning. As we have faced a challenging COVID situation and came to the conclusion that with the help of technology, the education sector would come back successfully. In the era of technological advancement and creativity, it is necessary that we should have enough resources for the growth and development of the youth of the country. The youth of the country and the educational system plays a vital role in every step of shaping the innovation ecosystem in India. Out of the three major goals of Start-up India, one is to build a start-up and innovation culture across the nation. Gujarat is a vital source of new innovations and start-ups, catering to both, new products and services that form the very base of the ecosystem that the Gujarat Student Start-up and Innovation Policy is focused on building. That is why the Innovation Club has been set up in Government, Non-Government, Grantee In Aid Colleges and Gram Vidhyapith, all over the State of Gujarat with the noble

intention that even non-technical students, (studying in Arts, Commerce , Science, Law & B.Ed. Colleges) under which plentiful number of students will be encouraged for creative ideas and will be prepared for start-ups. In fact, colleges and universities can play a key role in providing a fertile ground for cultivation of world-changing, innovative and entrepreneurial ideas. For this purpose, there is a need to understand the objectives, tools,training and initiatives taken by the Innovation club in Education.

RESEARCH QUESTIONS

The investigator has the following research questions for this study.

1. What is the meaning of Innovation & Innovation Club?
2. How can any institute format an Innovation club?
3. How many tools are there for the Innovation Club?
4. What kind of initiatives are taken by Innovation Cell?
5. What are the benefits of Innovation Club in Education?

MEANING OF INNOVATION AND INNOVATION CLUB

➢ **Innovation**

▪ According to Cambridge Dictionary,"Innovation means a new idea or method, or the use of new ideas and methods."
▪ Innovation is the practical implementation of ideas that result in the introduction of new goods or services or improvement in offering goods or services. (Wikipedia)
▪ Innovation is defined as introducing something new. It allows the growth of many new ideas, customs, and inventions. Innovative ideas can change the course of our lives for the better. It works in all fields – be it education, business, or entertainment.

➢ **Innovationclub**

▪ Innovation club: Imagination is the base of innovation.
▪ Innovation club is a concept to inspire and indulge non-technical students to work on their ideas and convert them into startups.
▪ Innovation club is being created to Express & Explore Ideas of Students and to Find Local Solutions of Local Problems.Innovation club is based on STEM(Science, Technology, Engineering, and Mathematics) pedagogy which is based on experiential learning.
▪ The Innovation Club is a platform to engage students in innovative and creative activities apart from providing opportunities for hands- on training activities.

FORMATION OF INNOVATION CLUB

Innovation club is a landmark initiative by Higher Education Department, Government of Gujarat to empower Arts, Commerce, Law, B.Ed. and Science Students with new generation technologies like Artificial Intelligence, Coding, Drone, 3D Pen, AR-VR, Aerospace, Robotics etc. in an effort to alter the innovation ecosystem in the education sector and prepare students for new Digital India under the Leadership of our Prime Minister Shri Narendra Modi , Chief Minister Shri Bhupendra Patel, Education Minister Shri Jitu Vaghani , Shri Dr Kuber Dindor , Principal Secretary Shri S J Haidar Sir,Commissioner of Higher Education Shri M. Nagarajan , Joint Commissioner Shri Naryan Madhu sir and The Member Secretary of the GUJCOST Dr. Narottam Sahoo Commissioner of Higher Education Gujarat government and GUJCOST Department of Science and Technology, Government of India. STEMbotix is honored to be the training partner for this initiative where the STEM Innovation coach introduced the Students of the Arts, Commerce, Science, law and B.Ed. streams with these new technologies and their first hands on experiment on these technologies which is important for them to diversify their career opportunities in the industry.

Objectives of Innovation Club

▪ To provide a platform for non-technical students to share new and innovative ideas and will be prepared for startups.
▪ To support and nurture the innovators both intellectually and financially
▪ To identify and promote the grass-root level innovations by students and the faculty
▪ To create a network of innovators and thus creating a culture of innovation in the education Field

Members of Innovation Club

▪ One staff member from each branch will become Coordinator of Innovation Club.
▪ Minimum five students with enthusiasm in their field of study from each branch as Club members.

Activities of Innovation Club

▪ This club may organize periodic meetings of the club members to generate new ideas and identify innovations.
▪ Stakeholders may be invited to share their innovative ideas and skills and showcase their innovative products/projects.

- ▪ It may organize seminars, webinars, expert talkor conferencesto keep the spark of creativity, innovation, and design alive and thrive them in students
- ▪ It can organize awareness campaigns,activities and competitions like quiz, debates, posters, dramas etc on creativity and innovations within schools/college/university.
- ▪ Can engage in innovative activities, workshops, training and programs.
- ▪ It may be a good idea to publish such information in the form of a magazine or newsletter on innovation on a periodic basis, say monthly or quarterly.
- ▪ It can act as an effective means of sharing ideas, mutual learning, networking, mentorship and creativity.
- ▪ Arranged activities related to technical support in the form of basic tools, shackles, equipment, raw materials and project manual/report.

TOOLS OF INNOVATION CLUB
There are mainly two tools available for Innovation club activities.

Innovation Club:Tools
    Amrut Navsarjan

    Advanced DIY Kits

AMRUT NAVSARJA
"**AmrutNavsarjan**" is a coding platform that will enable young children and teachers learn to think critically and build 21st-century abilities such as creativity, logical thinking and Innovating. It is a Coding platform that will help young kids/ teachers learn to think and develop very essential skills for the 21st century like working creatively, systematically and working with collaboration with the team.This platform is interactive Visual based, Block Based programming application to create games, Stories and Animation with creative learning. It is an interactive and easier coding or logical programming software with easy to use and understand drag and drop blocks with Local cultural sprites and backgrounds.

➢ **Key Features of Amrut Navsarjan Platform**
- ● It has a very user-friendly interface and drag and drop functionality adds up to itsfeatures that eliminates the need of remembering the tedious coding syntax which is the case in traditional coding languages which many times makes the children hesitant to practice programming.
- ● It also contains characters and backdrops on Indian culture,nature and heritage. So users can engage with it in more prominent ways.

➢ **Elements of Amrut Navsarjan Software**
- ● **Sprite** – Character or Image that follows set of Instruction
- ● **Stage** - Area where Sprite and background are seen
- ● **Block** - It is easy to understand logic blocks
- ● **Backdrop**- Background image
- ● **Script** – Set of blocks arranged in stack to be executed in sequence. Multiple Scripts can Run Simultaneously

➢ **Benefits of Amrut Navsarjan Software**
- ● Students learn on their best potential by workingon projects – and getting new innovative ideas, designing prototypes and finally making best output product by improving on it.
- ● When people focus on things they like and are passionate about, they can work longer and create output at their best potential.
- ● Peer Interaction will improve skills like teamwork and working together can get an even better outcome as many minds have acted upon the same idea.

ADVANCED DIY KITS
Preparation for life outside of College is one of the purposes of higher education and it is important for educators to create opportunities for students to better understand how skills obtained in the classroom can be applied to professional work.Do It Yourself (DIY) Kits include Advance Electronics Kit, Agri-Tech Kit, Basic Electronics ,Energy Conservation Kit,Mechanical Kit ,VR Globe Kit, Mechatronics Kit, Telescope Kit, Drone Kit and Advance Science Kit.

Education Department
Government of Gujarat
Commissionerate of Higher Education

STEM Robotics Prabodh level
DIY Kits Training Program

Under
Innovation Club

➢ **Goal of Advanced DIY Kits**
- Go Create a Hands-On Learning Environment
- Empower Creativity and Innovation
- Facilitate Real-World Understanding
- Prepare for Post-Graduate Plans
- Bolster Digital Engagement
- Improve Problem Solving Skills
- Leverage Design Thinking

➢ **Deliverable**
- ADVANCED DIY Kits (Hardware)
- Year around Curriculum(Soft)
- Advanced DIY Kit journals for students (Soft)
- Training and hand holding by master trainers to teachers and students twice a month
- Assessments and homework (Google sheet and projects

INITIATIES BY INNOVATION CELL

Innovation Cell, Higher Education Department, Government of Gujarat has set up Innovation Club in each institution of Government , Grant in Aid ,Gramvidhyapith and University. Following initiatives: Training, Workshop, Camp, Online Meeting, Competition and financial assistance provided to every institute by the Innovation Cell, Government of Gujarat taken by Innovation Cell, Gujarat.

Basics of Vernacular Innovation Training

The Basics of Vernacular Innovation Training (Online Mode)held from 01-01-2022 to 01-03-2022 through MS Teams platform under the guidance of expert Mr. Nikunj Panchal. He shared the information of Innovation Club, programing, Block programming and overview of "Amrut Navsarajan"software. Data ofVernacular training participation shown in below table.

SN	Institute Name	Number of Institutes	Number of Faculties (Minimum 02 faculty members from each institute)	Number of Students (10 students from each institute)
01	Govt. - Higher	110	220	1100
02	GIA - Higher	357	714	3570
03	Gram Vidhyapith	15	30	150
04	University	14	28	140
	Total	**496**	**992**	**4960**
	Total No. of Participants		**5952** (4960 + 992)	

Total 496 Institutes, 992 Faculty members and 4960 Students of Gujarat state were registered throughUDAYAM-COGENT Portal and actively participated in online Basics of vernacular Innovation training accomplished with assignments and feedback through MS Teams Platforms. On the basis of attendance and assignment criteria certificates were issued to coordinators and students by Innovation cell, Government of Gujarat.

Workshop

The **CommissionerateofHigherEducation** and GUJCOST under the banner of **Project Innovation Club workshop** and **Summer Camp workshop** held during the months of April-2022 and May -2022 . The benefit of this workshop was given to the 110 Government colleges and 358 Grant-in Aid colleges ,13 Gram Vidhyapith,14 Universities coordinators and students at different places of Gujarat State like Science City-Ahmedabad, M. S. University -Baroda, Hemchandracharya North Gujarat University-Patan, Saurastra University-Rajkot, Veer Narmad South Gujarat University-Surat, Porbandar, Junagardh, Banaskantha   etc. The various activities in this workshop groomed the coordinators how to take the " Idea to the Product " successfully. Basically it stressed on How non-technical persons can do Rocketry model launch demo, universe view with the help

of laser light, as well as knowing the distance between constellations and zodiac signs in the universe were included.Under this workshop, students were trained through DIY kits including Mechatronic Kit, Drone Kit, Advanced Science Kit, Agritech Kit and other kits. A special effort was made to promote innovation in education in the local language.

Coding Boot Camp

"Coding Boot camp for Innovation Club Students" on Amrut Navsarjan Platform in Vernacular language from 11th-13th July, 2022 was held at Vigyan Bhawan at Science City, organized by Innovation Club, Commissionerate of Higher Education, Government of Gujarat in collaboration with Department of Science and Technology, Government of Gujarat. Students are designing application by using advance Block Coding on Amrut Navsarjan Platform in Vernacular language.Students are learning to develop animation videos under this State Level Coding Boot Camp of Innovation Club.On third day, Shri M. Nagarajan, Commissioner, Higher Education Department has reviewed various animated videos and applications developed by our students during the training. He also interacted with students and motivated them to enhance their skills. STEMbotix Private Ltd., The valedictory session was graced by Shri Narayan Madhu, Joint Commissioner, Higher Education Department and Dr. Narottam Sahoo, Advisor, GUJCOST. Shri Narayan Madhu inspired participants for their bright future in the field of innovation. He also motivated students to become job creators rather than job seeker.District coordinators and students shared their learning experience. Dr. Mala Sharma summarised positive outcomes of the Boot camp. All the participants were awarded certificates for their active participation. Active teams of the students have been identified and rewarded with AR kit.In spite of extreme weather conditions, approximately 300 students along with their district coordinators registered and participated in this training with great enthusiasm and shared their experiences of Block Coding training in Vernacular Language and one- day summer induction camp of "Do-It-Yourself" kit. In this training, these students have arrived to learn and explore new avenues and to spread their wings in the journey of Innovation.

IdeaCompetition

Coding is the present and future language of this era, so this training aims to provide advance level Block Coding training at state level to the students of all Arts, Commerce, Science colleges, of all 33 districtsof Gujarat states. These students have been winners of the District Level Block Coding competition. Amrit Navsarjan Projects /Ideas of trained students and Innovation club coordinator of Commerce, Science, Arts, B.Ed., Law Colleges and Gram Vidhyapith under Innovation Club for Coding.

List of Competition Themes:

1. Panchaprakalpa

-Environment, sanitation, water conservation and water storage

-Prevention of corona infection and vaccination

-Cow based natural farming

- Drug addiction and prevention of dowry (dowry practice and prevention of dowry)

2. Fit India (Sports & Athletics)

3. Women empowerment

4. Climate Change

5.Self-reliantIndia

STEMRoboticsPrabodhlevelTraining

Under the Innovation Club, Commissionerate of Higher Education initiated 4 days DIY kits training program known as"STEM robotics Prabodh level Training". This training has been initiated in 110 Government colleges and 358 Grant-in Aid colleges of Gujarat state at college level from July 4 – 2022, in which more than **50** students actively participated from each college. In the first round of STEM Robotics Prabodh level training students enthusiastically participated and showed their interest in various kits like Drone kit, Mechatronics kit, Agri-tech kit, Advance electronic kit, Mechanical kit, Digital telescope and Advance Science kit. In colleges of rural areas, Agri-tech kits were the center of attraction for the students. They were happy that it would actually help them to solve issues related to agriculture to a certain extent. When the students of Arts, Commerce and Science stream tried hands-on on the Drone kit, Mechatronics kit and Agri-tech kit they were joyous and contended to realize that they worked on the applied side of science without being from technical background.Even after the training hours, students interacted personally with the trainer and learned various uses of kits provided to them.

GARIMA Cell

Gujarat Accreditation and Ranking Institutional Mechanism Arrangement(GARIMA) Cell launched under National Education Policy 2020 by Innovation Club , Government of Gujarat on 7th July , 2022 at Science City , Ahmedabad. GARIMA Cell works on the following criteria:

● Institutional Benchmarking, Evaluation and Accreditation objectives will be achieved.

● Institutions of higher education will achieve benchmarks set at National and International levels.

● Training or guidance arrangements will be arranged for the colleges.

BENEFITS OF INNOVATION CLUB

1. Prominent identity in the field of Innovation: Gujarat students advance in the field of innovation, research and startup.
2. Careers in business fields: Students studying in the fields of arts, commerce and science start a business and build a career.
3. Adventure activities: Entrepreneurial activities gain momentum;they need to be encouraged to be entrepreneurs and innovators.
4. Creation of prototype model: Innovative Ideas will create prototype models through new technology.
5. Generate their ideas and convert these ideas into real life products with tools provided by innovation club.
6. Creates awareness, educates, nurtures and inculcates a culture of innovation amongst students and enables them to generate new ideas and become more innovative in their outlook.
7. BoostingCritical thinking, creativity and imagination, on top of strong subject-based, and social and emotional skills, are keys to the success of innovation.
8. Best platform to discuss ideas and thus promote the culture of innovation in education.
9. Hands on block coding activities like Games,Robotics and Drone development.
10. Interactive education become possible through subject based creative animation through Amrut Navsarjan.

CONCLUSION

It is said, "Innovation is the ability to see change as an opportunity - not a threat". It is the human tendency to fear change. But there is one section of the human race that will always welcome the change and accept the challenge that is the youth. Young minds if ignited with innovative thoughts definitely can create wonders. Innovation can do a lot for us in ways we never thought possible. As a system, education would benefit from having a well-designed innovation club strategy. Innovations in education can only transform the educational system if they are widely accepted by the students, teachers, administrators, communities, and any stakeholders related to the educational system. The introduction of the innovation club must have a significant impact on the educational system or achieve its objectives. Finally, innovation in education requires strong evaluation. Without a broad and widely shared culture of evaluation, innovation clubs will remain stuck at the level of well-intended but isolated pioneering efforts. Education policies need to cover developing these skills as a matter of key importance. So, let us create a platform in the form of Innovation Club in all institutes of Government,GIA, Gramvidhyapith and University to integrate innovation in our education system.

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