

Creating Entrepreneurial Ecosystem in Higher Education Institutes: A Case Study

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Abstract: As of late, technological innovation and entrepreneurship have been underlined in engineering education. There is a need to all the more likely comprehend which individual and contextual level factors are identified with engineering students' innovative goals. The Innovation and Entrepreneurship Development Centre (IEDC) at Kalasalingam Academy of Research and Education was established as an initiative of the National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi to create an entrepreneurial culture and foster growth of innovation and entrepreneurship amongst the faculty and students. This centre has designed innovative and systematic strategies to train the students from the beginning and take them through the journey of becoming a confident and successful entrepreneur. Every year this centre is providing financial support to several students to the tune of 15 lakhs per project for developing innovative products supported under the various schemes of the Government of India such as DST start-up, MSME, and so on. Apart from the financial support, mentoring and infrastructural support for these projects are also extended. The centre also arranges various activities and awareness camps related to Entrepreneurship, Technology-based Innovation, and Idea to Product contests for the students throughout as they move from the first year to the fourth year of their study. As an outcome of all these the students have started 10 start-up companies in the last three years and started generating revenue income. Moreover, these companies have created job opportunities for various job seekers. IEDC has also supported Start-up companies by providing the proper office set-up with the necessary infrastructure. Therefore, the students become entrepreneurs and give a job to another Student. Apart from the Financial Grants from the Government of India, the IEDC centre helps in getting loans from banks to establish their companies in a large set-up. And also, this Centre

with students and entrepreneurs for their better living. The proposed framework reacts adequately to the rising difficulties and openings both at national and worldwide dimensions identifying with Small and Medium-sized Enterprises (SMEs). It will be accomplished by checking out the design challenge, orientation and awareness programs, workshops, and transient courses to support undergraduate students to progress toward becoming trendsetters and business visionaries.

Keywords: Innovation, Entrepreneurial Ecosystem, Start-ups

1. Introduction

2. Innovation and Entrepreneurship Development Centre (IEDC) at Kalasalingam Academy of Research and Education was established as an initiative of the National Science and Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi to create an entrepreneurial culture and foster growth of innovation and entrepreneurship amongst the faculty and students. The IEDC at KARE has set up an action with the National Science and Innovation Entrepreneurship Development Board (NSTEDB), Department of Science and Technology (DST), New Delhi in the insightful year of 2014- 2015. The action intends to develop an institutional instrument to make a venturesome society in academic foundations that develop the improvement of headway and business endeavor among the staff and understudies. Reliably of IEDC surrenders cash related assistance to one lakh rupees for each innovative idea for different understudies to shape their inventive idea into things [1]. Besides money-related assistance, it in like manner gives training and Infrastructural support to these exercises. Innovation and Entrepreneurship Development Centre consistently sort out activities and camps to propel advancement-based turn of events also, undertaking among the understudies [2, 3]. This inside similarly gives the distinctive business events to our understudy's region. The understudies with their introduction may attempt their creative aptitudes and transformed into a financial specialist. [4, 5]

2. Methodology

In Classroom – At the study hall level alongside subject learning, we are giving data about continuous applications and innovations utilizing in the current pattern. Giving the

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keeps on supporting the Alumni Entrepreneurs through various aspects through guiding them related to Technological-based problem to solution, Marketing, and even Financial assistance. On the whole, IEDC joins hands

understudies a stage to relate subject ideas to continuous applications. In Department – At this level, we are directing network administration venture rivalries among understudies. Our understudies review neighborhood settlements concerning necessities and concoct new ventures to support them. The master's investigations and waitlist the best task and prize the understudy with "Dr.Abdul Kalam grant "at the departmental level. In Institution – Every division direct undertaking rivalry the understudies need to think of imaginative tasks utilizing current pattern innovations furthermore, idea. Our foundation tie-up with a few associations like the Department of Science and Technology, Entrepreneurship Development Institute of India, Micro, Small, and Medium Enterprises, and so forth, these help understudies to upgrade their venture to genuine-world business.

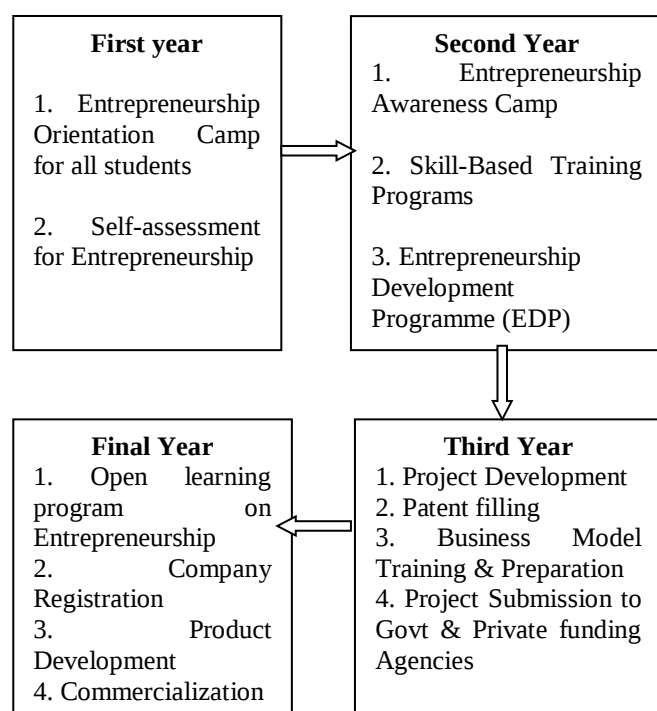


Fig. 1 Methodology

IEDC and IIC expect to give the pre-brooding claims to fame for understudy's undertakings. Through this cell, we are arranging direction camps, mindfulness camps identified with business enterprise furthermore, Innovation. Right off the bat, Orientation camps have been given to all the rookie understudies in their 1styear. Through these camps, we give brief information about the enterprise and give thoughts for business and, propel them about make or plan to start their own business. Besides, Awareness camps have been given to 2ndyear understudies for three days. During these camps, understudies find out about their relative area business thoughts and undertaking in their area. We additionally give them insights regarding how to discover the best strategy, how to make the best answer for the issues looking in field-tested strategy, where to get

financing to begin an organization. We teach them pretty much all the administration financing, awards, and private financing offices. We additionally give Skill development program to 2ndyear understudies through this program we give area base preparing concerning advantage and mechanical specialists share their insight and direction to the understudies in their area courses.

Thirdly, the understudies have to discover the issues their neighborhood adventures confronting and think of arrangements that are helpful for inspiring the adventures. They learn through continuous contextual investigations. In the 3rdyear understudies present their business ventures. We help them to patent their business thoughts and give preparing for venture models and present these models for getting assets from both government and private offices. Ultimately in the 4thyear, we center around organization enlistment, item improvement through hatching focuses, and commercialization of the items. Overall, the Innovation and Entrepreneurship Development cell and Institution Innovation Council holds hands with understudies and business people for their fantasy future.

3. Funds supported to our students

Through our Innovation and Development centre, we are encouraged twenty-five student teams to get Rupees one lakh grant from the Department of Science and Technology for converting their ideas into prototype level as well as product development.

Table 1. Technical Outcome

Title of the project	Outcome in terms of product/process development	Current Status Patent filled if any, Socially/Economically Relevance
Smart Revolution In Agricultural Process	To Be Commercialized	Patent Filed , Socially Relevant
Low Cost Photomograph For Detecting Thyroidism	Got fund from DST-NIDHI. Started their own venture : Raj Bioelectronics And Intelligent Pvt. Ltd More than 3 Biomedical products are Manufactured through this Company	Patent Filed, Socially Relevant
Semi Automated Air Filter Cleaning Device	To Be Commercialized	Patent Filed, Economically Relevant
Recharging Electronics Cars With Nozzle And Horizontal Wing Turbine	To Be Commercialized	Patent Filed, Economically Relevant
Manually	To Be	Patent Filed,

Operated Single Cylinder Triple Acting Pump	Commercialized	Economically Relevant
Point Of Sale (An App For Small Business)	To Be Commercialized	Economically Relevant
Design Of Economically Feasible Fluoride Removal Unit	To Be Commercialized	Patent Published Socially Relevant
Efficacy Of Bio Control Agents Viz. <i>Pseudomonas Sp</i> And <i>Trichoderma Sp</i> . And Control Of Onion Diseases	Got fund from DST-NIDHI. Started their own venture : Ringarr Biocontrol Pvt. Ltd More than 2 Agricultural products are Manufactured through this Company	Patent Filed , Socially Relevant
Implementation Of Highly Automated Uav With Gps For Product Delivery	To Be Commercialize	Economically Relevant Patent Filed
Indexing In Milling: A Geneva Mechanism Approach	To Be Commercialize	Economically Relevant Patent Filed
Beneficial Enzyme For Bio Processing Agro Industrial Waste	Got fund from DST-NIDHI. Started their own venture : SKIM Biotech Pvt. Ltd More than 2 Enzyme products are Manufactured through this Company	Patent Filed, Economically Relevant
Noise Reduction in Muffler of the exhaust System	Got fund from DST-NIDHI. Started their own venture : NAV Mufflers Pvt .Ltd	Patent Filed, Economically Relevant
Coin Based Mobile Charger	To Be Commercialized	Economically Relevant Patent Published
Smart Water Supply Management System	To Be Commercialized	Socially Relevant
Fabrication of Multipurpose Bolt & Nut Remover and Joiner	To Be Commercialized	Economically Relevant
Design and implementation of low cost veterinary physiological	To Be Commercialize	Patent Filed Socially Relevant

monitor		
Fabrication Of Fixture To Perform Turning In Abrasive Water Jet Machine	To Be Commercialized	Economically Relevant
Polyethylene glycol coated prosthetic heart valve – A novel coating materials	To Be Commercialized	Economically Relevant
Biodegradable Packaging Fil From Food Waste	To Be Commercialized	Socially Relevant
Smart Hat For Visually Challenged Person	To Be Commercialize	Patent Filed, Socially Relevant
Development Of Juice To Prevent Gastro-Intestinal Tract Cancer Using Banana Stems	To Be Commercialize	Socially Relevant
Bio Polymer And Graphene Nano Sheet Based Food Packing Material Which Can Be Efficiently Used For Carbonated Beverage Packaging	To Be Commercialized	Economically Relevant
Development of Electronic Lockers with Multiple keys using Visual Cryptography Scheme	To Be Commercialized	Economically Relevant
Attachable Wheelchair Automator	To Be Commercialized	Socially Relevant
Smart Tube light	Started own venture: Yugti Smart Solutions Pvt. Ltd. More than 2 products are Manufactured through this Company	Patent Filed, Socially Relevant

Apart from that we have provide following funding opportunities to our student's community towards innovation & start-up.

- DST-NIDHI- Rs 10 Lakh Per Project
- MSME- - Rs 15 Lakh Per Project
- Innovation Voucher Program-Rs.2 to 5 Lakh
- Venture Support
- Angel Support

4. Outcomes and Achievements

By implementing this methodology, students are benefited from their innovative projects and also granted financial support from respective government organizations. From which the students have started a company (Start-up) and also giving a job to others, thus became a good Entrepreneur. Table. 1. Illustrates that the initially 9 innovative projects are granted a fund of Rs. 10,00,000/- for each project from DST under NIDHI Scheme.

Table. 2. List of 9 innovative projects are granted a fund of Rs. 10,00,000/- for each project from DST under NIDHI Scheme

S.No	Project Title	Dept	Company Name
1	Noise Reduction in Muffler	Auto	NAV Mufflers Pvt .Ltd
2	Production of Biofungicide with Earthworm	Bio Tech	IWO Biosciences Pvt. Ltd
3	Beneficial Enzyme for Bio processing Agro Industrial Waste	Bio Tech	SKIM Biotech Pvt. Ltd
4	Smart Cart for Super Market	CSE, ECE	Yugti Smart Solutions Pvt. Ltd.
5	Efficacy of Bio control Agents viz. Pseudomonas sp and Trichoderma sp. and control of onion diseases	Bio Tech	RingarrBiocontrol Pvt. Ltd
6	Design and Development of Low Cost Photomograph for Identification of Thyroid Dysfunction	ECE	Raj Bioelectronics And Intelligent Pvt. Ltd
7	Low Cost High Performance Inverter	EEE	Minniayal Pvt. Ltd
8	ECO friendly Manufacturing of Tiles from used PET Bottles	Mechanical	Compimero Makers Pvt.Ltd
9	Low cost Smart Cleaner for Solar Panels	EEE	Thaaniyal Pvt.Ltd

Table. 3. Commercialization of Products granted by DST under NIDHI Scheme

S.No	Innovation / Start-Up Name	Name of the Founders	Products
1	Minniayal Pvt. Ltd	Saurabh Kumar Sharma, NRagupathi	Solar Inverter

		Muthu	
2	SKIM Biotech Pvt. Ltd	G Santhana Krishnan, Shwetha Selvam	Keratinase Enzyme YakaTi Yaha K Soft
3	Raj Bioelectronics and Intelligent Pvt. Ltd	N Pothirasan, VMuneeshwaran, Raja Sudharsan R	Bipolar electro surgical generator Intelligent Home Automation Water Level Indicator
4	Ringarr Biocontrol Pvt. Ltd	B Rakshana , Adhvidha	Pf2 act for Onions Pf2 plus for Cardamom Pf2 Humic for all crop plants

The details of funds granted for innovative projects to make the students an entrepreneur. Funds Sanctioned is Rs. 4, 10, 50, 000 /- from which the received funds are Rs. 1, 60, 50, 000/-. Initially Received Rs.14 Lakhs cash award from DST for the best contribution of our start-up Nidhi and Entrepreneurship activities in 2017-18 and Received Rs.2 Lakhs cash award from DST for the best contribution of our start-up Nidhi and Entrepreneurship activities in 2018-19. Then, KARE got an MHRD approval for Establishing Institute Innovation Council in Our Innovation Cell in 2018-2019 and got a 4-star rating for our Entrepreneurship, Innovation, and Start-up activities. With support from DST NIDHI, 9 students have started their start-up companies on our University campus. This institution was one of the Top 100 institutions in Atal Ranking of Institutions on Innovation Achievements (ARIIA)-2019 and approved as Business Incubation from Ministry of MSME, a grant worth of Rs.2.5 Crores.



Fig. 2 Successful Start-up companies by Students of Kalasalingam Academy of Research and Education

Kalasalingam Academy of Research and Education was one of the Top 25 institutions (Deemed University-Band A) in Atal Ranking of Institutions on Innovation Achievements (ARIIA)-2020. Now, we have more than 120 alumni entrepreneurs.

5. Conclusions

Thus, the KARE-IEDC concludes that students should start with the mission statement, companies should have agility in their mission statement, Scope, getting Minimal viable product done, Work without interruption and bureaucracy, Transparency, Learn from retrospective reviews and customer feedback. This approach has been implemented in Kalasalingam Academy of Research and Education. After implementing this approach, it is noted with a good effect on the entrepreneurial culture inside the campus. Moreover, students and faculties are highly attracted and receiving more innovative ideas, which leads to a better future for the student community towards entrepreneurship and their economic development.

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