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A Study on the Impact of IEDC in Fostering Student Entrepreneurs in Kerala

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Abstract: *This research investigates the role of Innovation and Entrepreneurship Development Centres (IEDCs), an initiative under the Kerala Start-up Mission, in developing student entrepreneurship among arts and science colleges in Kerala. It investigates students' knowledge about IEDC initiatives and the success of these centres in developing entrepreneurial skills and attitudes. The data collected from 120 students from three colleges indicated that IEDC experience enhanced students' knowledge on entrepreneurship considerably with entrepreneurial attitude, creativity and communication being the most developed skills. Seminars and workshops were the most well-recognized and effective activities although other activities such as hackathons and visits to Fab Lab remained low in awareness. Statistical tests revealed significant differences in awareness and perceived usefulness of IEDC programs across colleges but not departments or gender. It was also observed that more than half of the respondents had started business enterprises because of IEDC influence, highlighting their contribution towards student-initiated start-ups. These results present useful information to policymakers and education institutions to ensure institutional support to student entrepreneurship and raise the level of visibility and influence of IEDC activity..*

Keywords: Entrepreneurial mindset, Entrepreneurship education, Innovation and Entrepreneurship Development Centre (IEDC), Student entrepreneurship, Startup ecosystem, Value-added courses

I. INTRODUCTION

Innovation and Entrepreneurship Development Centres (IEDCs) are a flagship program of the Kerala Start-up Mission with the aim to foster innovation and entrepreneurship among students and the academic community in educational institutions in Kerala. As an umbrella program, IEDCs have a critical role in creating a culture of innovation in academic environments. Over the past few years, there has been increasing awareness of the need to encourage entrepreneurship among students as a way of stimulating innovation, economic development and employment. Schools have answered this call by setting up IEDCs with the objective of developing entrepreneurial culture, offering resources, mentorship and networking to potential student entrepreneurs.

The functions of IEDCs are diverse here, involving a range of activities and programs aimed at motivating, teaching and mentoring the future generation of business entrepreneurs. By facilitating the conduct of workshops, boot camps and indirect funding support, IEDCs help immensely in fostering an entrepreneurial experimentation and development-friendly environment within the academic arena. Nonetheless, even as IEDCs spread in institutions, concerns still linger whether they are actually effective in facilitating student entrepreneurship. These concern if IEDCs are doing enough to help overcome the hurdles of venturing and scaling up and how their effect can be objectively measured beyond participation levels to assess their value contribution towards successful start-ups and resilient entrepreneurial ecosystems.

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This research aims to investigate students' awareness of the different programs introduced by IEDCs in colleges and analyze the functioning of IEDCs in developing student entrepreneurs. Finally, the goal is to help progress entrepreneurship education and ecosystem building by making fact-based contributions to understanding how IEDCs can empower the future generation of innovators and change-makers more effectively, releasing their potential to stimulate economic growth, generate employment and solve critical social issues.

Entrepreneurship has become a key engine of economic development and innovation, especially among students who can determine the future of industries. In this regard, IEDCs are important platforms for developing entrepreneurial skills and nurturing innovative ideas. However, there is limited knowledge of how effectively these centres enhance entrepreneurial development, with added complexities of differing levels of student awareness of the initiatives provided. This unawareness may ideally hamper students from maximizing available resources in terms of IEDCs. The current research seeks to address these issues by investigating the contribution of IEDCs in student entrepreneurship as well as analyzing students' awareness of IEDC programs. Results obtained from the study are anticipated to help maximize the operations of IEDCs and make them more effective in terms of furthering student entrepreneurship in Kerala.

Training programs offered by IEDCs have also been especially helpful, preparing future entrepreneurs with the information and abilities required for starting and developing successful businesses. Through an assessment of the effect of IEDCs, this research determines strong methods and best practices that support student entrepreneurial achievement, including mentorship programs, access to capital, networking opportunities and skill development programs. The findings are of direct relevance to policymakers, schools and universities, and entrepreneurship development authorities, offering evidence-based support to the development of policies and resources allocation towards entrepreneurial activities. To this end, the research not only adds value to the region's institutional support frameworks but also to overall regional economic development and social welfare aspirations.

The study includes a detailed examination of the strategies, programs, and initiatives pursued by IEDCs to benefit prospective student entrepreneurs. It evaluates the centres' effectiveness in helping develop entrepreneurial competencies, changing entrepreneurial mindsets, access to essential resources, offering mentorship, enabling networking opportunities, and overall success of students in starting and maintaining ventures. Additionally, the study examines the extent of awareness among students on various IEDC initiatives.

The literature provides meaningful information about the operation and effects of IEDCs. Dr. Johan Wiklund (2018) emphasizes that IEDCs have positive effects on students' intentions to expand their businesses, pursue investment, and grow businesses, hence promoting an entrepreneurial ecosystem that encourages growth-oriented student ventures. Michael Thompson (2018) discussed gender-specific issues within the IEDC framework and highlighted the vital nature of IEDCs in providing mentorship, facilitation, and enabling environments specifically for women entrepreneurs, leading to equal success rates for female start-ups. Dr. Rajeev Roy (2019) compared the international effect of IEDCs on entrepreneurship development in the emerging economies, highlighting their role in economic growth, innovation, and employment generation. Dr. Sarah L. Jack (2019) discovered that IEDCs with experiential learning experiences, hands-on assignments, and real-world simulations contribute significantly to enhancing students' problem-solving skills, decision-making capacities, and business knowledge, narrowing the gap between practice and theory in entrepreneurship education. Emily Chen (2020) emphasized how IEDCs promote a culture of innovation and risk-taking among student entrepreneurs and foster creativity, along with effective support mechanisms. Recently, Jessica Evan (2022) investigated the IEDC-enabled internationalization of student start-ups and found that they provide rich networks, market exposure, and cross-cultural interaction opportunities that are critical for developing global entrepreneurial skills.

Through insights into how IEDCs can improve support and development for student entrepreneurs, this research offers a basis for enhancing the entrepreneurship ecosystem in Kerala universities toward a dynamic, innovation-based economy.

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IEDC Activities in Nurturing Student Entrepreneurs

The Innovation and Entrepreneurship Development Centre (IEDC) is also important in developing student entrepreneurs through various activities. Seminars, webinars, and workshops expose students to the basics of innovation, while hands-on workshops provide actual practice of new skills. Competitions such as hackathons, idea pitching, business pitching, and start-up pitching promote creativity, critical thinking, and actual problem-solving skills in real-life scenarios. Boot camps and trainings in entrepreneurship provide students with in-depth knowledge and entrepreneurial skills needed to launch and operate ventures. The programs offer dynamism in learning opportunities that motivate risk-taking, leadership, and innovation in students.

Further, programs like industrial visits and Fab Lab tours close the gap between theory and industry practice, ushering students into practical operations and state-of-the-art technologies. Through such programs, the IEDC provides an entrepreneurial orientation by providing guidance, networking, access to resources, and access to newer innovations. These programs taken together enable students to convert ideas into sustainable businesses, thereby equipping the entrepreneurial ecosystem in educational institutions to grow.

Methods

The study was carried out among three top IEDC-registered Arts and Science colleges in the Malappuram district of Kerala: MES Ponnani College, MES Mampad College, and Malabar College of Advanced Studies Vengara. 120 students were randomly selected, with 40 students from each college. Primary and secondary sources were used to collect data and a descriptive research design was used.

Hypothesis

To determine the association between student awareness of the Innovation and Entrepreneurship Development Centre (IEDC) and different demographic variables, the Chi-square test of independence has been used. The hypotheses developed for this research are: (H1) Awareness of IEDC is independent of the college to which the student belongs, (H2) Awareness of IEDC is independent of the department of the student, and (H3) Awareness of IEDC is independent of the gender of the student. Chi-square test is applicable in this analysis since it looks at whether or not there is a significant association between categorical variables. Two distinct one-way ANOVA tests were performed to look at if students' perceived use or value of IEDC resources and awareness level of IEDC programs vary by the college that they belong to.

H1: Awareness of IEDC is independent of the College the student belongs to.
H2: Awareness of IEDC is independent of the student's department.
H3: Awareness of IEDC is independent of the student's gender.
H4: There is no significant difference in the mean level of utilization or usefulness of IEDC resources among students of various Colleges
H5: There is no significant difference in the mean level of awareness of IEDC programs among students of various Colleges

II. ANALYSIS & DISCUSSION

Table 1: Change in understanding of entrepreneurship after involvement in IEDC.

Significantly improved	66	55%
Improved	36	30%
No change	18	15%
Decrease	0	0
Total	**120**	**100%**

Source: Primary data

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The above table reveals that most of the respondents (55%) have reported that their knowledge about entrepreneurship has "Significantly improved" following interaction with IEDC. 30% of respondents reported that their knowledge has "Improved" There is a smaller group, 15% of respondents witnessed "No change".

Table 2: Rating the specific skill enhanced through IEDC

SKILLLS	NO. OF RESPONDENTS					WEIGHTED AVERAGE	RANK
	5	4	3	2	1		
Creativity	54	42	14	4	6	244	2
Leadership	48	40	16	4	12	228	6
Problem solving skills	62	24	20	4	10	237	3
Entrepreneurial mindset	64	30	16	4	6	248	1
Critical Thinking	52	34	14	10	10	229	5
Risk taking skills	48	36	18	8	10	227	7
Communication	46	48	16	2	8	237	3
Networking skill	50	44	14	2	10	236	4
Financial skills	36	42	28	8	6	224	8
Time management	28	46	28	12	6	216	9
Technical skills	20	54	20	14	12	202	10

Source: Primary data

The following table presents the ranking of different skills developed through IEDC according to respondents' ratings. Ratings range from 5 (maximum) to 1 (minimum), and every skill has a weighted average value is computed. Entrepreneurial attitude is the highest valued skill ranked First with weighted average value 248. Technical skill is least valued ranked 10th with weighted average value 202.

Table 3: Level of awareness initiatives offered by IEDC

INITIATIVES	NO. OF RESPONDENTS					WEIGHTED AVERAGE	RANK
	5	4	3	2	1		
Seminar	72	32	8	6	2	262	1
Webinar	62	36	12	8	2	253	2
Workshop	72	24	20	4	0	262	1
Hands on workshops	64	24	24	8	0	252	3
Competitions	56	46	10	4	4	251	4
Trainings	50	42	20	6	2	245	6
Boot camps	42	46	16	12	4	233	8
Hackathons	24	56	24	12	4	220	11
Idea Pitching Competitions	42	48	22	8	0	242	7
Business pitching competition	44	48	22	8	0	247	5
Start-up competition	40	46	18	14	2	223	9
Industry visit	32	46	24	4	4	222	10
Fab lab visit	30	42	20	20	8	209	12

Source: Primary data

The above chart and table show awareness levels of IEDC initiatives, ordered by weighted average scores. Seminars and workshop (262) are most aware, followed by fab lab visits (209) and hackathons (220), which are least aware. This

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shows that seminars and webinars are the most aware initiatives, while fab lab visits and hackathons require more awareness efforts.

Hypothesis formulation

For each of the three independent variables (College, Department and Gender), formulated the null hypotheses:

College vs. Awareness of IEDC:

Null Hypothesis (H_0): Awareness of IEDC is independent of the College the student belongs to.

Department vs. Awareness of IEDC:

Null Hypothesis (H_0): Awareness of IEDC is independent of the student's department.

Gender vs. Awareness of IEDC:

Null Hypothesis (H_0): Awareness of IEDC is independent of the student's gender.

Table 4: Summary of Chi-Square Test Results
(Awareness among Colleges, Departments, Gender)

Independent Variable	Chi-Square Value	df	p-value	Significance ($\alpha = 0.05$)	Result
Colleges (MES Ponnani College, MES Mampad College and Malabar College of Advanced Studies, Vengara) vs. Awareness of IEDC	9.406	2	0.009	Significant	Awareness depends on Colleges
Departments (Commerce, Arts and Science) vs. Awareness of IEDC	2.478	2	0.29	Not Significant	Awareness does not depend on Department
Gender (Male and Female) vs. Awareness of IEDC	0.21	1	0.647	Not Significant	Awareness does not depend on Gender

Interpretation of Results

The Chi-Square test delivers informative findings about the determinants affecting students' perception of Innovation and Entrepreneurship Development Centre (IEDC) activities in three Arts and Science Colleges in Kerala.

College vs. Awareness of IEDC: There is a significant correlation between the college that the student is associated with and awareness of IEDC programs (p-value = 0.009 < 0.05). This implies that awareness significantly differs across various colleges. Some colleges can be more proactive in organizing IEDC activities, whereas others can improve their efforts. Therefore, institutional initiatives and campus life seem to have an important function in instilling student consciousness.

Department vs. Awareness of IEDC: The findings support no statistical correlation between the student's department (Commerce, Arts, or Science) and their awareness of IEDC (p-value = 0.29 > 0.05). This is an indication that awareness is relatively equal across academic disciplines. Departmental background does not appear to have an effect on the awareness of students about entrepreneurship development activities.

Gender vs. IEDC Awareness: Likewise, gender and IEDC awareness are not significantly related (p-value = 0.647 > 0.05). Both male and female students are equally aware of the programs, suggesting gender does not cause any discernible imbalance in gaining knowledge or engaging in IEDC programs.

Level of utilization or usefulness of IEDC resources among students of various Colleges

Null Hypothesis (H_0): There is no significant difference in the mean level of utilization or usefulness of IEDC resources among students of various Colleges

Level of awareness of IEDC programs among students of various Colleges

Null Hypothesis (H_0): There is no significant difference in the mean level of awareness of IEDC programs among students of various Colleges

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Table 5: Summary of ANOVA Results on Usefulness and Awareness of IEDC Programs

Variable	College	Mean Score	F-value	p-value	Significance	Interpretation
Usefulness of IEDC Programs	MES Ponnani College	53.75	11.347	0.000	Significant ($p < 0.05$)	Usefulness of IEDC programs significantly varies across colleges. Students from Ponnani Colleges perceive higher usefulness.
	MES Mampad College	43.75				
	Malabar College of Advanced Studies	44.15				
Level of Awareness of IEDC Programs	MES Ponnani College	43.05	4.019	0.021	Significant ($p < 0.05$)	Level of awareness about IEDC programs significantly differs among Colleges. Ponnani College students show higher awareness.
	MES Mampad College	38.80				
	Malabar College of Advanced Studies	38.05				

Interpretation of ANOVA Results

Level of IEDC resources and Colleges' utilization or usefulness: The ANOVA analysis indicates that the perceived usefulness of IEDC resources significantly differs among students in various Colleges ($F(2,117) = 11.347$, $p < 0.001$).

Descriptive Statistics: MES Ponnani College students posted the highest mean use or benefit of IEDC facilities with score ($M = 53.75$), followed by Malabar College of Advanced Studies students ($M = 44.15$) and MES Mampad College students ($M = 43.75$).

Interpretation: This implies that students' belief regarding the usefulness of IEDC resources greatly differs across colleges. Students in MES Ponnani College find the programs more useful than students from the other two colleges. Institutional factors like program quality; efforts of promotion or activities of student engagement may be responsible for such variations.

Level of IEDC Programs and College Awareness: The ANOVA analysis also shows there is a difference in the awareness level of IEDC programs between students belonging to various colleges ($F(2,117) = 4.019$, $p = 0.021$).

Descriptive Statistics: MES Ponnani College students once more had the highest mean awareness score ($M = 43.05$), while MES Mampad College ($M = 38.80$) and Malabar College of Advanced Studies ($M = 38.05$) took the second and third positions, respectively.

Interpretation: These findings indicate that awareness levels of students regarding IEDC activities vary significantly across Colleges. Students of MES Ponnani College show a higher level of awareness, which may be due to effective communication strategies, more dynamic IEDC cells, or more active student engagement in entrepreneurial activities.

Table 6: Starting of business on the impact of IEDC

PARAMETERS	NO. OF RESPONDENTS	PERCENTAGE
Yes	64	53.3%
No	56	46.7%
Total	**120**	**100%**

Source: Primary data

The above table shows that the respondents 53.3% started business on the impact of IEDC. 46.7% not started any business on the impact of IEDC.

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IV. RESULTS

IEDC's role in developing student entrepreneurs:

The research found that 55% of the students felt a substantial change in their entrepreneurial knowledge after engaging in IEDC activities. Another 30% of the students mentioned moderate change. Entrepreneurial Mindset was found to be the most developed skill through IEDC participation, followed by Creativity and an equal ranking between Problem Solving and Communication skills. Networking Skills and Critical Thinking also registered substantial improvements in participants. Nevertheless, Technical Skills and Time Management scored lowest on improvement. Seminars and workshops received the highest rating, both attaining a weighted average of 262, with nearly 60% of the students scoring them the highest. Webinars and hands-on workshops were a close second, with more than 50% of the participants scoring them highly. It contrast, activities like Fab Lab trips and Hackathons were assigned lower marks and only received positive scores from nearly 25% of the students. The analysis shows that as many as 53.3% of respondents have started their own business endeavor after participating with IEDC activities. It reflects the inspirational impact of IEDC toward encouraging entrepreneurship activities among students. Yet, 46.7% of the respondents have not yet started a business, indicating the need for additional support mechanisms.

Level of awareness among the students about the different initiatives provided by IEDC

The chi-square test indicated there was a meaningful relationship between departments and IEDC awareness ($p = 0.009$), meaning there are differences in awareness across colleges. Yet there was no relationship between departments and awareness ($p = 0.29$) or gender and awareness ($p = 0.647$). Awareness of IEDC, therefore, depends on the college but not the department or gender.

ANOVA analysis revealed that perceived usefulness of IEDC programs is highly variable across colleges ($p = 0.000$), where MES Ponnani College students had the maximum mean score (53.75). Likewise, awareness about IEDC programs also differs highly between colleges ($p = 0.021$), where MES Ponnani College students were found to be more aware. Both these findings indicate that both usefulness and awareness are college-specific.

Suggestions

It is suggested that the IEDC improve its programs by providing more personalized mentoring and experiential entrepreneurial activities. Feedback mechanisms should also be implemented continuously to improve responses to learning needs of all students. Targeted initiatives for developing technical and time management skills in students need to be given top priority in IEDC programs. Incorporating specialized workshops and real-life simulations could fill skill gaps identified.

IEDCs must remain focused and expand seminars, workshops and webinars, which patently work for students. They must also enhance and promote rated lower initiatives like Fab Lab trips and Hackathons to their full potential.

IEDC efforts must formulate college-specific plans for increasing awareness on a targeted level, especially across institutions with poorer awareness levels. Also, similar promotion across every department and gender group must continue to provide for equal access as well as representation.

Efforts should be made to standardize the effectiveness and visibility of IEDC programs in all participating colleges. Target interventions should be done in colleges having low mean scores in order to increase usefulness and awareness for students.

IEDCs need to initiate incubation support, mentorship, and funding aid to help more students take their ideas to businesses. Ongoing follow-up and sophisticated entrepreneurial training are bound to improve conversion rates of student entrepreneurs.

V. CONCLUSION

Innovation and Entrepreneurship Development Centre is a project undertaken by KSUM to enhance entrepreneurial culture among Kerala college students. The research finds that increasing numbers of students are utilizing IEDC for their entrepreneurial development. IEDCs are a platform for budding entrepreneurs to learn and scale up their business ideas through providing resources, training and mentorship. The long-term objective of IEDCs is to establish a sustainable ecosystem that promotes economic development and employment generation. Therefore, IEDC has indeed been successful in their endeavor and still has scope for further growth and development.

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This research emphasizes the critical role played by the Innovation and Entrepreneurship Development Centre (IEDC) in developing student entrepreneurship, which greatly enhanced students' interest and awareness. High participation and appreciation for different initiatives of IEDC illustrate its effectiveness. Students are generally aware of IEDC initiatives, although communication strategies could be diversified. Various activities conducted by IEDCs like idea pitching, workshops, boot camps, hackathons etc. inculcate innovation and entrepreneurial culture among students. Moreover, these centres provide a platform for aspiring entrepreneurs to learn and grow their business ideas by offering resources, training and mentorship. Through IEDCs not only start-ups and entrepreneurs are born but also it helps to develop personal qualities such as leadership, communication skills, networking skills etc. among students. IEDCs would play an instrumental role in generating entrepreneurial and innovation culture in Academic institutions.

From the study we can say that IEDCs of colleges are actively performing so many programmes which are assisting the aspiring student entrepreneurs to start their goal. Student start-ups can be considered as the sign of positive influence of IEDC amongst students. Expansion of the start-ups under IEDCs is useful in forming the economy and creating a beneficial change in employment opportunities.

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