



PARAMETRIC ANALYSIS OF INNOPRENEURSHIP IN UNIVERSITY SYSTEM USING TAGUCHI METHOD

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Abstract

This research paper aims to study the initiatives to be taken by Universities through the development and promotion of Innovation and entrepreneurship. Traditional Universities role has gradually evolved and changed and they are now redirecting the new knowledge, student's innovations for nations economic development through University Incubation centres. A parametric model is developed to illustrates how University Innopreneurship is functioning for the selected parameters. Current research paper is dealing with understanding and analysing the changing dynamics of University education system in nurturing University Incubation through various parameters affecting the same by Taguchi method. The Taguchi analysis result shows that the university Leadership and Governance is the major factor influencing the innopreneurship process. This also provides a sound platform for young entrepreneurs for their innovative ideas through innopreneurship process.

Keywords: Innovation, Entrepreneurship. innopreneurship process. Regression analysis, Taguchi Method.

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1. INTRODUCTION

Innopreneurship is a combination of innovation and entrepreneurship. It is a mindset that focuses on creating new and innovative [3] products, services, or processes that can lead to sustainable businesses. Universities can play a crucial role in promoting innopreneurship spirit among their students, faculty, and staff. Here are some ways universities can foster an innopreneurial culture. Most of the Universities have initiated Innovation and Incubation centre at university campus. Still the goal is yet to achieve because of many of obstacles and challenges. Few challenges are discussed as follows based on the review [1].

a). Lack of Training and Industrial Support, Lack of entrepreneurial mind set, no standard metrics that can measure University performance concerning incubators.

b). Active Industry-University tie-ups and actual participation of Industry mentors.

c). Building interdisciplinary trends, generating start-up groups by collaborating students from varied backgrounds, existing curriculum having less scope on entrepreneurial education are the key challenges observed in University Incubation centre.

The main part of building the model is to find a way to integrate entrepreneurship and Innovation in HEI education system. For meeting this aim, the entrepreneurial learning competence centres can be established at HEIs. On the other hand, in

the HEIs the work still continues. During the process it has become evident that engineering teachers need to be trained for entrepreneurial learning. In addition, increasing the comprehension of the meaning and content of entrepreneurial mindset and thinking takes time and resources. This process needs support from management and stake holders to develop a strong university with more employments.

OBJECTIVES

To study the Influencing parameters in Innovation and Entrepreneurship Process in universities. The entrepreneurial activity of the organization/program is affected by various parameters. The purpose of the evaluation is to develop a better understanding of how the entrepreneurial activity as a whole have contributed to the innopreneurship of the university system. The system parameters are complex in nature and are studied using Taguchi method.

INNOPRENEURSHIP MODELLING

The following case material are prepared and referred from various literature and also from other sources for universities to use as inspiration for developing their own strategies and activities under Innopreneurship process. The listed parameters are studied and are the areas of the guiding framework but many of them fit more than one category. Many are very broad and others relate to very specific initiatives. Some of areas to be considered [6] in this study are listed in Table-1:

Table 01: Critical Area in Innopreneurship

| S No | Critical Areas |
|------|--|
| 1 | Leadership and Governance |
| 2 | Organisational Capacity |
| 3 | People and Incentives |
| 4 | Entrepreneurship development in teaching and learning |
| 5 | Pathways for entrepreneurs |
| 6 | The Entrepreneurial University as an internationalised institution |

Based on the case study, the faculties and Program have autonomy to act. Each faculty has its own board and develops its own strategy related to Entrepreneurship course. There is no formal hierarchical structure, with each professor free to design his or her own research agenda using following Key parameters to enhance Innopreneurship.

Following are the few key parameters based on the survey are:

a) Key Parameter: The university has a model for coordinating and integrating entrepreneurial activities at all levels of the system.

b) Key parameter: The institution's entrepreneurial objectives are supported through a wide variety of funding sources/investment, including investment by external stakeholders.

c) Key parameter: There are mechanisms in place for breaking down traditional boundaries and fostering new relationships - bringing internal stakeholders together (staff and students) and building synergies between them.

d) Key parameter: Human Resource Development for entrepreneurship education is in place

e) Key parameter: Entrepreneurial behaviour is supported throughout the university experience; from creating awareness and stimulating ideas through to development and implementation (pre-business and business start-up).

f) Key parameter: The university is structured in such a way that it stimulates and supports entrepreneurial learning

g) Key parameter: Staff take an entrepreneurial approach to teaching in all departments, promoting diversity and innovation in teaching and learning

h) Key parameter: The institution validates entrepreneurship learning outcomes

i) Key parameter: Engagement of external stakeholders is a key component of teaching and learning development in an Entrepreneurial University

j) Key parameter: The institution supports innovative approaches to learning, such as the use of mentors, living labs, cross disciplinary learning, entrepreneurship champions, etc

k) Key parameter: The university provides support for individuals and groups to move from entrepreneurial ideas to action for further outcome.

l) Key parameter: Entrepreneurship education activities and start-up support are closely integrated as per observations.

m) Key parameter: The university specifically supports staff and student mobility between academia and the external environment.

n) Key parameter: The university demonstrates active involvement in partnerships with a wide range of stakeholders. The university links research, education and industry (wider community) activities together to affect the whole knowledge ecosystem

o) Key parameter: The university links research, education and industry (wider community) activities together to affect the whole knowledge ecosystem

p) Key parameter: The university has strong links with incubators, science parks and other external initiatives, creating opportunities for dynamic knowledge exchange

q) Key parameter: The institution seeks and attracts international and entrepreneurial teaching staff in the organisation.

2. PARAMETRIC ANALYSIS AND RESULTS

Taguchi Method:

Taguchi method is a powerful tool for improving the quality and effectiveness of the innopreneurship process in a university system. By identifying the key factors that affect the outcome of the innovation process and optimizing them, universities can enhance their ability to develop innovative

students and services that meet the needs of their stakeholders
Following Table-2 shows various Parameters used for Analysis with different

parametric ranges of 1-10 in this study. The survey questionnaire is designed and collected from Students for the analysis.

Table-02: Innopreneurship parameters used in the study.

| S No | Parameters | Low | Mid | High |
|------|--|-----|-----|------|
| 1 | Leadership and Governance | 3 | 7 | 10 |
| 2 | Organisational Capacity, People and Incentives | 3 | 7 | 10 |
| 3 | Entrepreneurship development in teaching and learning | 3 | 7 | 10 |
| 4 | Pathways for entrepreneurs and Innovation | 3 | 7 | 10 |
| 5 | University –business/external relationships for knowledge exchange | 3 | 7 | 10 |
| 6 | The Entrepreneurial University as an internationalised institution | 3 | 7 | 10 |
| 7 | Measuring the impact of the Entrepreneurial University | 3 | 7 | 10 |

Table-3 for S/N Ratio for LG

| Level | A | B | C | D | E |
|-------|-------|-------|-------|-------|-------|
| 1 | 16.30 | 13.16 | 15.61 | 13.98 | 14.45 |
| 2 | 12.81 | 15.95 | 15.14 | 17.59 | 14.79 |
| 3 | 17.93 | 17.93 | 16.30 | 15.48 | 17.81 |
| Delta | 5.12 | 4.78 | 1.16 | 3.62 | 3.36 |
| Rank | 1 | 2 | 5 | 3 | 4 |

Table -4 for Means of LG

| Level | A | B | C | D | E |
|-------|-------|-------|-------|-------|-------|
| 1 | 7.111 | 5.111 | 6.444 | 5.556 | 5.667 |
| 2 | 4.778 | 6.778 | 6.333 | 7.667 | 6.000 |
| 3 | 8.000 | 8.000 | 7.111 | 6.667 | 8.222 |
| Delta | 3.222 | 2.889 | 0.778 | 2.111 | 2.556 |
| Rank | 1 | 2 | 5 | 4 | 3 |

The analysis shows rank of influencing parameters as in the Table based on S/N ratio and means. The Mathematical model for Leadership and Governance [LG] is found by regression analysis as:

$$LG = -1.48 + 0.444 A + 1.444 B + 0.333 C + 0.556 D + 1.278 E$$

From Table-02 The Leadership and Governance [LG] model is obtained and based on S/N Ratio the parameter ranking

obtained is 1-2-5-3-4. Parameter B and E are Highly influencing in the university based on the LG model developed. Similarly for remaining key parameters the statistical analysis can be applied for further analysis and study of innopreneurship process. Based on this study the Taguchi method can be a powerful tool for improving the quality and effectiveness of the innopreneurship process in a university system. The study also

identifies the key factors that affect the outcome of the innovation process and optimizing them, universities can enhance their ability to develop innovative products and services that meet the needs of their stakeholders. Based on Taguchi method [13] following Parameter variation graphs are found for above considering Means and SN

ratio. The response objective considered here is larger is better.

The developed model is attempting to reflect the diverse characteristics of the entrepreneurial process in university system, so that all university can recognise themselves and identify potential areas and key parameters for overall development of the system.

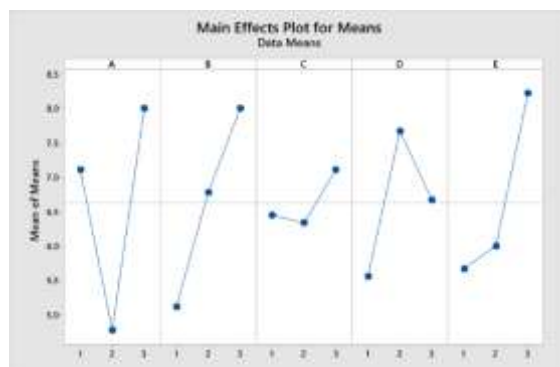


Figure-01: Main effect plot for Means.

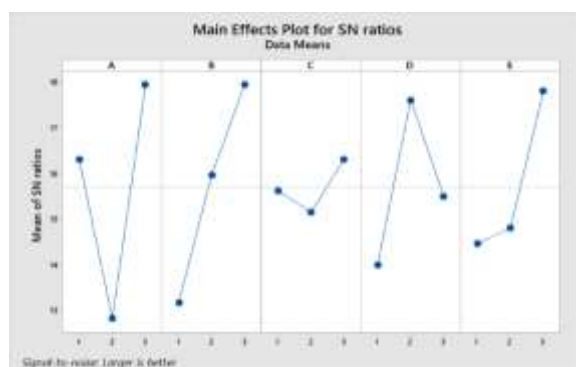


Figure-02: Main effect plot for SN Ratio

3. CONCLUSION

The Innopreneurial university involves the creation of new business ventures by university professors, technicians, or students. The study reviews on various parameters affecting the cultivation of innopreneurship in all private university for quality enhancements. From analysis it is found that Leadership and Governance are highly dependent on parameter A and B of the organization. Taguchi analysis shows parametric level influencing leadership and governance are A3-B3-C3-D2-E3. Similar study can be extended to know strong

parameters to influence the outcome of innopreneurship culture in the Universities.

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