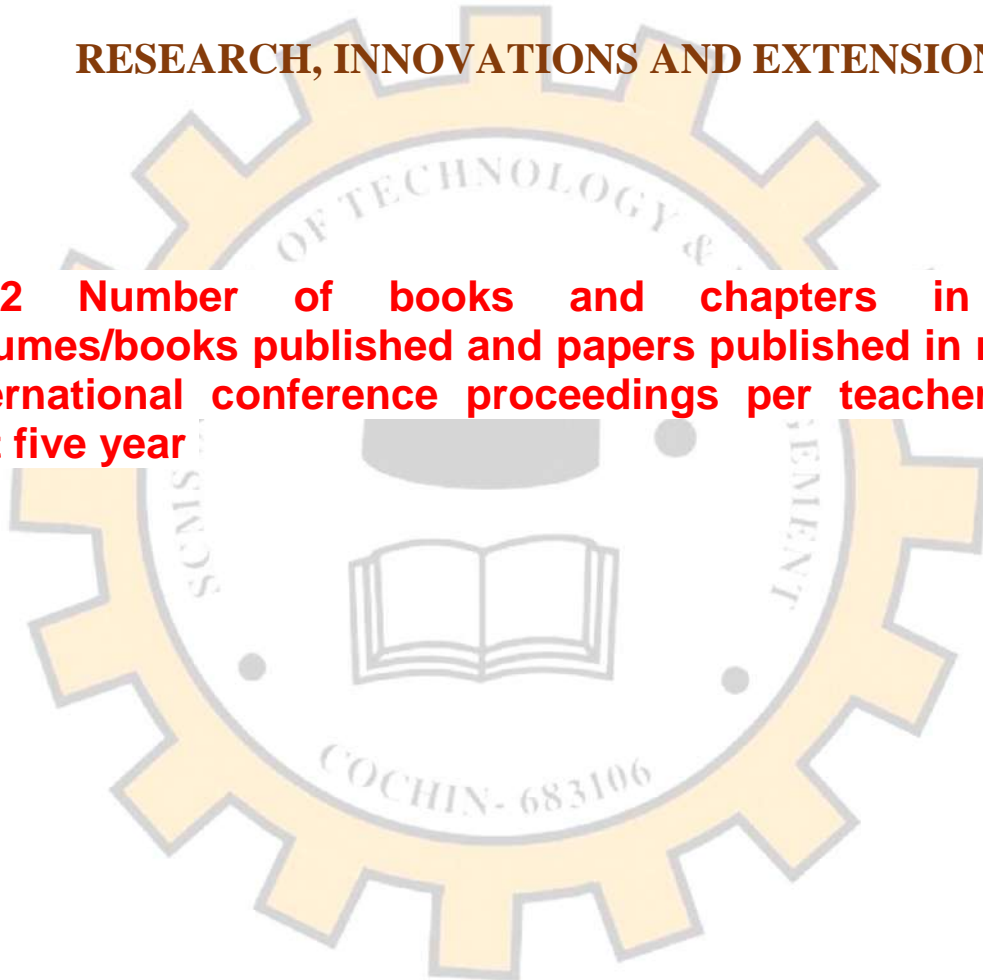




CRITERIA 3

RESEARCH, INNOVATIONS AND EXTENSION

3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year



3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year

2021-2022

Sl. No.	Title of the book/chapters published	Name of the teacher
1.	Origin and development of Hindi language and structure of Hindi	Dr. Sujith Kumar
2.	De-motivating factors towards entrepreneurship career among management student	Tess Jacob
3.	Pokkali Krishi	Dr. Surya Babu S.
4.	Bio entrepreneurship in Biosciences - Recent Approaches	Divya U. K.
5.	Research Report Writing – Craft it well	Dr Praveena K. and Dr. Radha Thevannoor
6.	India Quiz	Govind S Menon
7.	Development of a photovoltaic thermal collector	Govind S Menon
8.	Differential Binding of SARS-COV-2 Variants to Anti-viral molecules: An In Silico Study	Sethulekshmy Nair
9.	The Potential of Kaempferol Derivatives As Anti SARS-CoV-2 Drugs By In Silico Docking Study.	Harish M.
10.	Business, Economic s and society – the shifting paradigm	Dr Deepa Pillai
11.	In Silico prediction of new drug candidate from Piper nigrum against bacterial Mur A gene	Kurian Anoja
12.	Molecular Docking Analysis of Apigenin against Bacterial FtsZ gene	Deepthi D C
13.	Anti-inflammatory action of quercetin against Cyclooxygenase-1 enzyme, an Insilco approach	Harish M
14.	Identifying the potential role of curcumin analogues as anti-breast cancer agents in an In silico approach.	Divya U. K.
15.	REal Life Management	Deepa Pillai



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PRINCIPAL
SCMS SCHOOL OF TECHNOLOGY AND MANAGEMENT



1. Dr. Sujith Kumar- Self Learning Material and MCQs of 3rd and 4th Semester Programmes 2019

हिंदी भाषा : उद्भव और विकास और
हिंदी भाषा की संरचना
ORIGIN AND DEVELOPMENT OF HINDI
LANGUAGE AND STRUCTURE OF HINDI
(HIN3C10)



SELF LEARNING MATERIAL

III SEMESTER

M.A. HINDI
(2019 Admission)

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**School of Distance Education
University of Calicut**

Self Learning Material

(III Semester)

M.A. HINDI

(2019 Admission)

**HIN3C10 : ORIGIN AND DEVELOPMENT OF HINDI
LANGUAGE AND STRUCTURE OF HINDI**

Prepared by:

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MODULE- ONE

हिंदी की ऐतिहासिक पृष्ठभूमि

भारतीय आर्यभाषा का महत्व संसार की सभी भाषाओं में सार्वधिक है। ये भाषाएं समृद्ध साहित्य व्याकरण के सम्मत रूप और प्रयोग के आधार पर अपनी पहचान के साथ सामने आई है।

भारतीय आर्यभाषा का विभाजन

भारतीय आर्यभाषा की पूरी श्रृंखला को 3 भागों में विभाजित किया जाता है-

1. प्राचीन भारतीय आर्यभाषाएं - 1500 ई.पू से 500 ई.पू तक।
2. मध्यकालीन भारतीय आर्यभाषाएं - 500 ई. से 1000 ई. पू तक।
3. आधुनिक भारतीय आर्यभाषाएं - 1000 ई. से अब तक।

प्राचीन भारतीय आर्यभाषाएँ

इनका समय 1500 ई0 पू0 तक माना जाता है। वस्तुतः यह विवादास्पद विषय है। इस वर्ग में भाषा के दो रूप अपलब्ध होते हैं- (i) वैदिक या वैदिक संस्कृत, (ii) संस्कृत या लौकिक संस्कृत। इन दोनों का भी पृथक-पृथक परिचय अपेक्षित है।

वैदिक या वैदिक संस्कृत

इसे 'वैदिक भाषा', 'वैदिकी', छान्द या 'प्राचीन संस्कृत' भी कहा जाता है। वैदिक भाषा का प्राचीनतम रूप ऋग्वेद में सुरक्षित है।

2. Tess Jacob: Demotivating factors towards entrepreneurship career among management student : ISSN:2336-2693 | E-ISSN:2336-4890

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Demotivating factors towards entrepreneurship career among management student

Tess Jacob

Assistant Professor B.Com Department SCMS School of Technology and Management Muttom, Kalamassery

ABSTRACT

Entrepreneurs are the key pillars for the development of a country like India hence it is in the developing stage. The person who is doing the process of entrepreneurship activity is called an entrepreneur. Students are taught to be executives, corporate leaders, directors and administrators through management education, which is a discipline of higher education. The goal of this research paper is to find out the demotivating factors among management students to pursue a career in entrepreneurship. With the use of SPSS software, the data was analyzed using descriptive analysis, one way ANOVA, cross tabulation and t-test. The study discovered that out of all the demotivating elements unavailability of capital is ranked one with 3.1683 mean and 1.36398 standard deviation.

Keywords: Economic development, Entrepreneur, Career, Demotivation and Capital

1 Introduction

Management education's primary goal is to mold future company leaders. Students learn how to build the necessary leadership skills through this program. People who work in management education must be able to adapt to new situations. In terms of legislation, regulations, and trends India has a large number of reputable management institutes that participate in the program for the progress of the country. Management institutes are marketing themselves on the basis of number of placements during the course duration. So while pursuing education, students look forward to highly paid jobs. They do not think about the entrepreneurial opportunities available in the market and are not willing to accept entrepreneurship as a career option. Certain demotivating factors are there behind the reason for not choosing an entrepreneurship career. The purpose of this study is to rank the various demotivating factors among management students and how it related with different demographic features.

2 Statement of the problem

In current situation, youngsters will start job hunting immediately after the completion of job. They will consider business as the last option in the career list. Management institutes and parents are not supporting the students to gain the entrepreneurship career; they will push the students to get highly paid jobs. Apart from that our education system focuses more on exams and results, instead of innovation and creative ideas. Hence, the problem is stated as demotivating factors towards entrepreneurship career among management students with reference to Kottayam district.

3 Objectives

- To study various demotivating factors towards entrepreneurship career among management students.
- To analyse the relationship between demotivating factors and various demographic features of management students.

4 Research Methodology

The researcher has adopted a descriptive study for this paper. Cochran sample size formula is used to select 208 samples out of the population since it is a finite population. The population for this study is all the final year management students in Kottayam district. A structured questionnaire is distributed among the management

students in Kottayam district to get the required number of samples. Under proportionate method, stratified random sampling method is adopted as the sampling technique. Stratified random sampling proportionate method is used as the sampling technique. 3 strata's were Strata 1. Government aided, Strata 2 Government university management, Strata 3 Private unaided.

Hypothesis

H1: There is significant relationship between demotivating factors and the demographic features of the respondents.

5 Review of Literature

Zahra et.al (2017) social business enterprise is a subordinate hypothesis of enterprise that can be called as social change through inventive thoughts, which maintain spirit and social mindfulness. Enterprise isn't just estimated by the money related perspective yet in addition estimated by the social advantages of feeling by society. These examinations expect that one has taken out social enterprise on the off chance that it has been true capital and disposition to support social change. Consequently, getting ready social business enterprise right on time among understudies is expected to encourage the level of youth inclusion in the advancement of national economy.

Washington et.al (2016) the adequacy of the business enterprise instruction has been for the most part evaluated as far as the quantity of new endeavours that are begun by the individuals who experienced business training. The current investigation for the most part centres on examining the view of understudies about an enterprise course and their inspiration to begin another business. The discoveries uncover that dominant part of the respondents concur that the course was pertinent and gave valuable data to begin a business and that the majority of them opined that Entrepreneurship is a methods for work creation, advancement, inventiveness and financial turn of events. The creators have likewise recommended a model for upgrading the viability of business enterprise course.

Adnan et.al. (2014) investigated the preparation on college understudies towards business in Saudi private college. The investigation indicated that individual mentality, social standards and saw conduct control are the primary variables impacting the expectations of the understudies towards enterprise as a vocation. It additionally uncovered that social standards incorporate the job of Business College; job of companions, family members and partners was not solid as far as effect on innovative intension according to this investigation.

Baker et.al. (2014) analysed the students' recognition on business training: the instance of college Malaysia Perils. The investigation clarifies that business enterprise information has an essential job in the financial development. This examination intends to research the business enterprise instruction in college, Malaysia and view of understudies on enterprise training. Essential information is gathered to uncover the showing strategy and their ideal business enterprise skills. The examination shows that the business enterprise education is favourable in Malaysia.

Kavitha (2014) considered the attitude of youth towards business enterprise an exploratory examination among the understudies in Coimbatore region. It has been intended to examine the components which are liable for the attitude of students towards business. The outcome shows that there is a connection between entrepreneurship attitude and opportunities and less connection between knowledge about available source of assistance.

Rengiah et.al. (2014) the reason for this examination is to look at the significant factors influencing Malaysian college student's aims to wander into business through entrepreneurship education. The issue is the manner by which to impart in the minds of students that they should wander into business rather looking for jobs. The research design comprises of building up a hypothetical framework with entrepreneurship education as the independent variable to test the dependent variable of enterprising intentions. The system utilized is quantitative, which incorporates an irregular sample from final year students who studies entrepreneurship as a subject curriculum from four innovative entrepreneurial focused Malaysian colleges.

6 Analysis and Interpretation

Demotivating factors of the respondents

Demotivating factors are those factors which demotivates a person from starting a new business venture. Demotivating factors may vary depends on circumstance and the respondent. This study considered 13 demotivating factors. Following table explains various demotivating factors with their mean, standard deviation and rank.

Demotivating Factors	Statistics		
	Mean	Standard Deviation	Rank
Unavailability of capital	3.1683	1.36398	1
Unavailability of labour	3.0000	.89551	2
Unavailability of raw material	2.8894	.99384	3
Government policies	2.7260	1.02004	4
Educational background	2.1635	1.10432	5
Bad Experience	2.1490	1.00333	6
Fear of Failure	2.1394	1.26062	7
Family background	2.1346	.87430	8
Environmental Condition	2.0288	.95762	9
Social status	2.0288	.90577	10
Society	1.9087	.97124	11
Traditionlism	1.8798	.78017	12
Religion	1.1538	.36167	13

Source: Primary data

Interpretation: By close observation, unavailability of capital is ranked 1 with mean value 3.1683 on a five point scale and S.D. is 1.36398. Followed by unavailability of labour and unavailability of raw material with mean value 3.0000 and 2.8894 and S.D. is .89551 and 86.99384. Religion is the least ranked demotivating factor which is in 13th place with mean value 1.1538 and S.D. is .36167.

Demotivating factors based on gender of the respondent

T-Test result of demotivating factor and gender

Demotivating factors	Levene's test for equality of variance		t- test for equality of means						
	F	Sig	t	Df	Sig.(2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
								lower	upper
Equal variances assumed	.978	.324	.315	206	.753	.02367	.07515	-.12450	.17184
Equal variances not assumed			.306	161.351	.760	.02367	.07739	-.12916	.17650

Source: Primary data

Interpretation: The result of the above table reveals that F value is (.978) which is significant at (.978, $p > 0.05$). So we accept the null hypothesis. Hence, there is no significant association between the demotivating factors and the gender of the respondents

Demotivating factors based on religion of the respondent
ANOVA- demotivating factor and religion of respondent

	Sum of Squares	df	Mean Squares	F	Sig
Between groups	13.241	2	6.620	29.980	.000
Within groups	45.271	205	.221		
Total	58.512	207			

Source: Primary data

Interpretation: The result of the above table reveals that F value is (29.980) is significant at (.000, $p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is significant association between the demotivating factors and the religion of the respondents.

Demotivating factors based on institution type of the respondent
ANOVA- Demotivating factor and Institution type of the respondent

	Sum of Squares	df	Mean Squares	F	Sig
Between groups	3.142	2	1.571	5.817	.003
Within groups	55.370	205	.270		
Total	58.512	207			

Source: Primary data

Interpretation: The result of the above table reveals that F value is (5.817) is significant at (.003, $p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is significant association between the demotivating factors and the institution type of the respondents.

Demotivating factors based on educational background of the respondent
ANOVA- Demotivating factor and educational background of respondent

	Sum of squares	df	Mean squares	F	Sig
Between groups	5.112	5	1.022	3.867	.002
Within groups	53.400	202	.264		
Total	58.512	207			

Source: Primary data

Interpretation: The result of the above table reveals that F value is (3.867) is significant at (.002, $p < 0.05$). So we reject the null hypothesis and accept the alternative hypothesis. Hence, there is significant association between the demotivating factors and the educational background of the respondents.

Demotivating factors based on parents income of the respondent
ANOVA- Demotivating factor and parents income of the respondent

	Sum of Squares	df	Mean Squares	F	Sig
Between groups	.155	3	.052	.181	.909
Within groups	58.357	204	.286		
Total	58.512	207			

Source: Primary data

Interpretation: The result of the above table reveals that F value is (.181) is not significant at (.909, $p > 0.05$). So we accept the null hypothesis. Hence, there is no significant association between the demotivating factors and the parent's income of the respondent

Findings

- Among various demotivating factors, unavailability of capital is the top ranked demotivating factor for not choosing entrepreneurship as career option.
- Religion is the least ranked demotivating factor for not choosing entrepreneurship as career option.
- There is no significant association between the demotivating factor and gender of the respondents with .978 values.
- Demotivating factors and the religion of the respondent is closely associated with .000 significance value.
- There is significant association between demotivating factors and the institution type of the respondents with .003 significance value.
- Education background of the respondents and demotivating factors are closely associated with .002 significance value.
- There is no significant association between the demotivating factors and the parent's income of the respondents with .909 values.

Suggestions

- Successful entrepreneurs could use social media sites to motivate young people by sharing their success stories or autobiographies.
- Authorities should take a few steps to educate parents about the importance of entrepreneurship and government support. The majority of respondents are unaware of the various government entities and services, and hence only have a rudimentary education.
- Students favour modern teaching approaches over traditional homework, projects, and lectures. So the recommendation is to introduce role play, business games, risk management games, and other activities to change the teaching style. This aids in the development of entrepreneurial qualities.

7 Conclusion

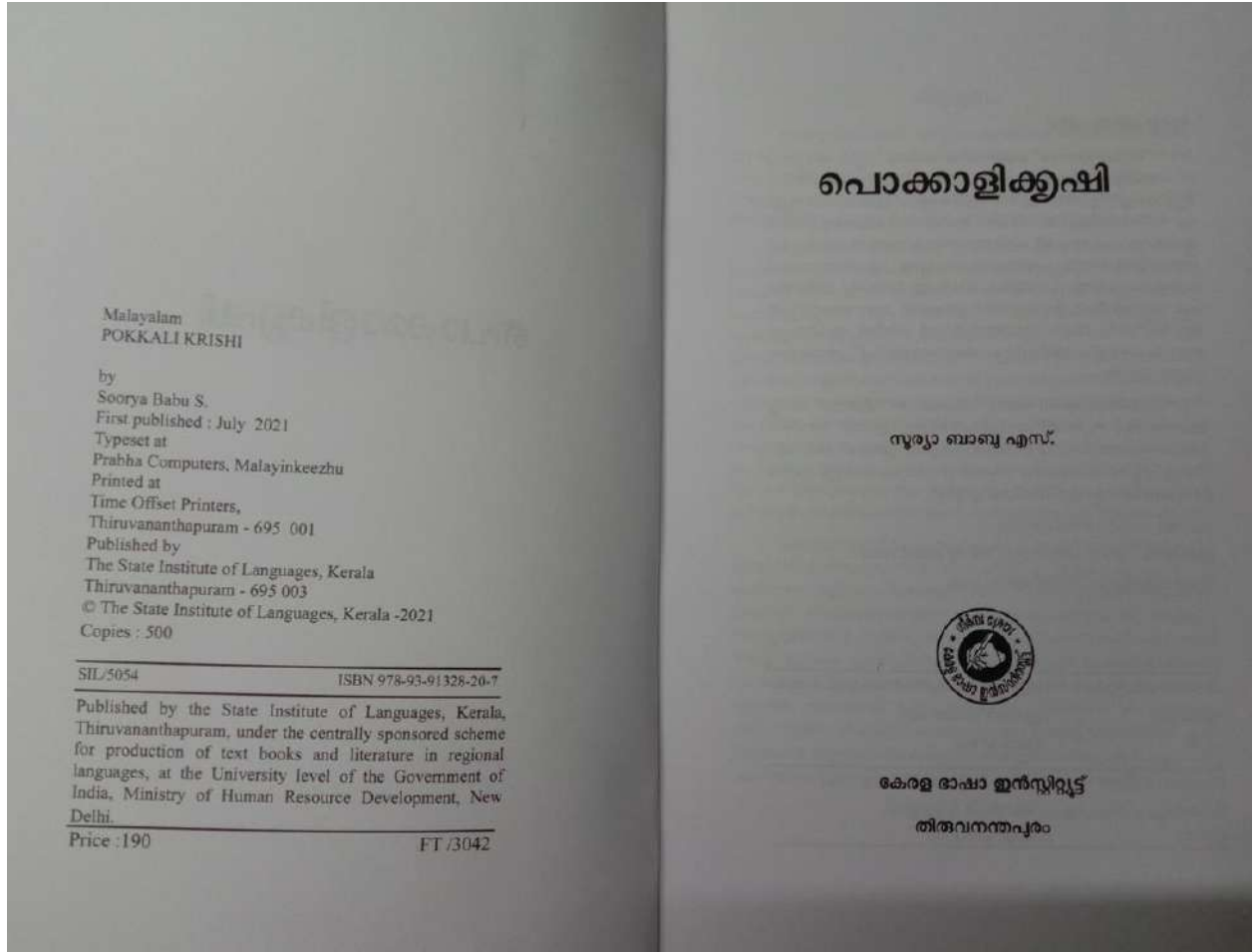
Majority of the management students are going behind the highly paid jobs in corporates because of few reasons. Initially, students may not have enough cash to find out initial capital at their young age without any support. Parents are not ready to take such financial risk hence majority come from middle class family. Therefore parents compel the students to join in companies. Government and management institutions should join their hands together to overcome the situation by organising awareness classes regarding the entrepreneurial institutions and the supports, financial institutions and the services to the students and parents. We can reduce the number of educated unemployed youth by new initiations at the early age.

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Sustainable Development Goals-2030 Agenda

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Introduction

Contents

❖ Introduction

❖ 17 SDG Goals :

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable

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12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Introduction

In 1987 Brundtland Commission Report described the concept of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” There are four dimensions to sustainable development which are intertwined together are society, environment, culture and economy.

The key areas of sustainable development are as follows: Climate change, Biodiversity, Disaster risk reduction, Sustainable consumption and production. The Goals and targets will stimulate action over the next fifteen years in areas of critical importance for humanity and the planet. The 5 P’s which are mainly taken into considerations are people, planet, prosperity, peace and partnership.

In order to promote awareness of the SDG (sometimes referred to as the Global Goals), a general logo and 17 individual icons have been developed. These guidelines are meant to enable information sharing, engagement, and collaboration and addresses three main components:

1. The words “Sustainable Development Goals”
2. A colour wheel visual identifier
3. Names for each of the 17 Sustainable Development Goals with corresponding individual icons for each goal.

2 | ISBN: 978-93-93942-38-8

Bioentrepreneurship in Biosciences - Recent Approaches

The words “Sustainable Development Goals” coupled together with the SDG colour wheel constitutes the SDG Logo.

There are two versions of the SDG Logo:

- SDG Logo: Version 1, which displays the United Nations emblem above or to the left of the SDG Logo
- SDG Logo: Version 2, which only contains the SDG Logo and does not display the United Nations emblem.

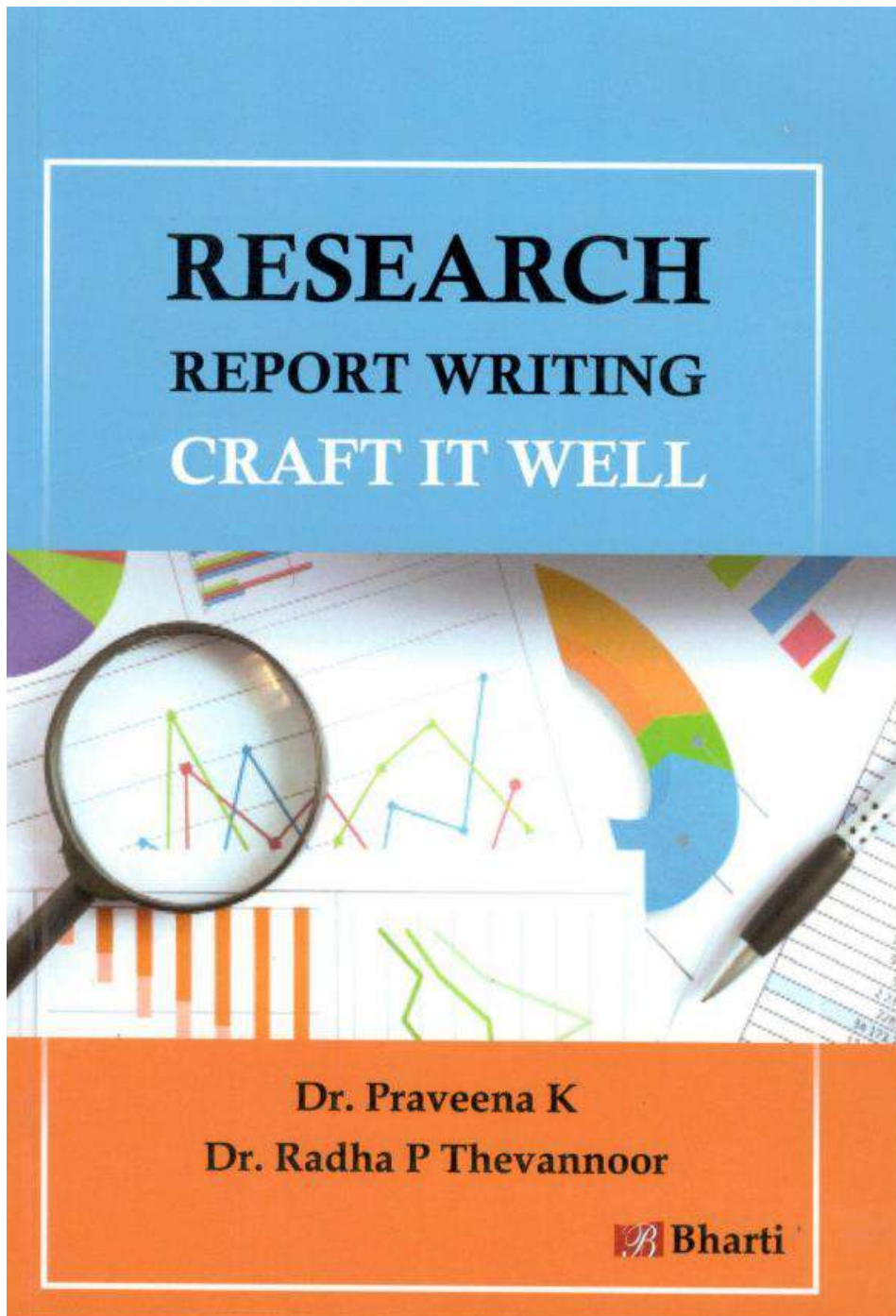
The use of the SDG Logo: Version 1, the SDG Logo: Version 2, and the 17 SDG icons is subject to the terms set forth in the present guidelines (Fig 1- The SDS Logo 1 and 2 and Fig 2- Seventeen sustainable development goal icons)



Fig1:

For non un entities: SDG LOGO, including colour wheel for web and print

5. Dr Praveena K. and Dr Radha Thevannoor: Research Report Writing – Craft it well
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About the Book



In the VUCA world, research is one area which is inevitable and also, the need of the time. Research spans across business units as well as academic units. Research writing is an art and needs a lot of effort, thinking and creativity as the whole work is to be put into comprehensive words for the readers. There are a lot of books on research methodology while there is a dearth in the area of research writing. This book provides a roadmap for the researchers and students in preparing a clear impressive research reports. The book is chaptered in tune with the thesis/reports in very simple manner to get an overall idea with apposite examples and serves as a handbook for students and researchers.

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Dr. Praveena K is presently working as Associate Professor with SCMS School of Technology and Management, Cochin, Kerala. She has over 15 years of teaching experience at PG level. A PhD holder from the School of Management Studies, Cochin University of Science & Technology, she has double master degrees- one in Computer Applications and other in Business Administration. Dr. Praveena is associated with many social researches in association with the local self-government bodies of the state. She has published several articles in both national and international indexed journals. Her research interests includes information systems, social media, quantitative research methods, marketing research etc.

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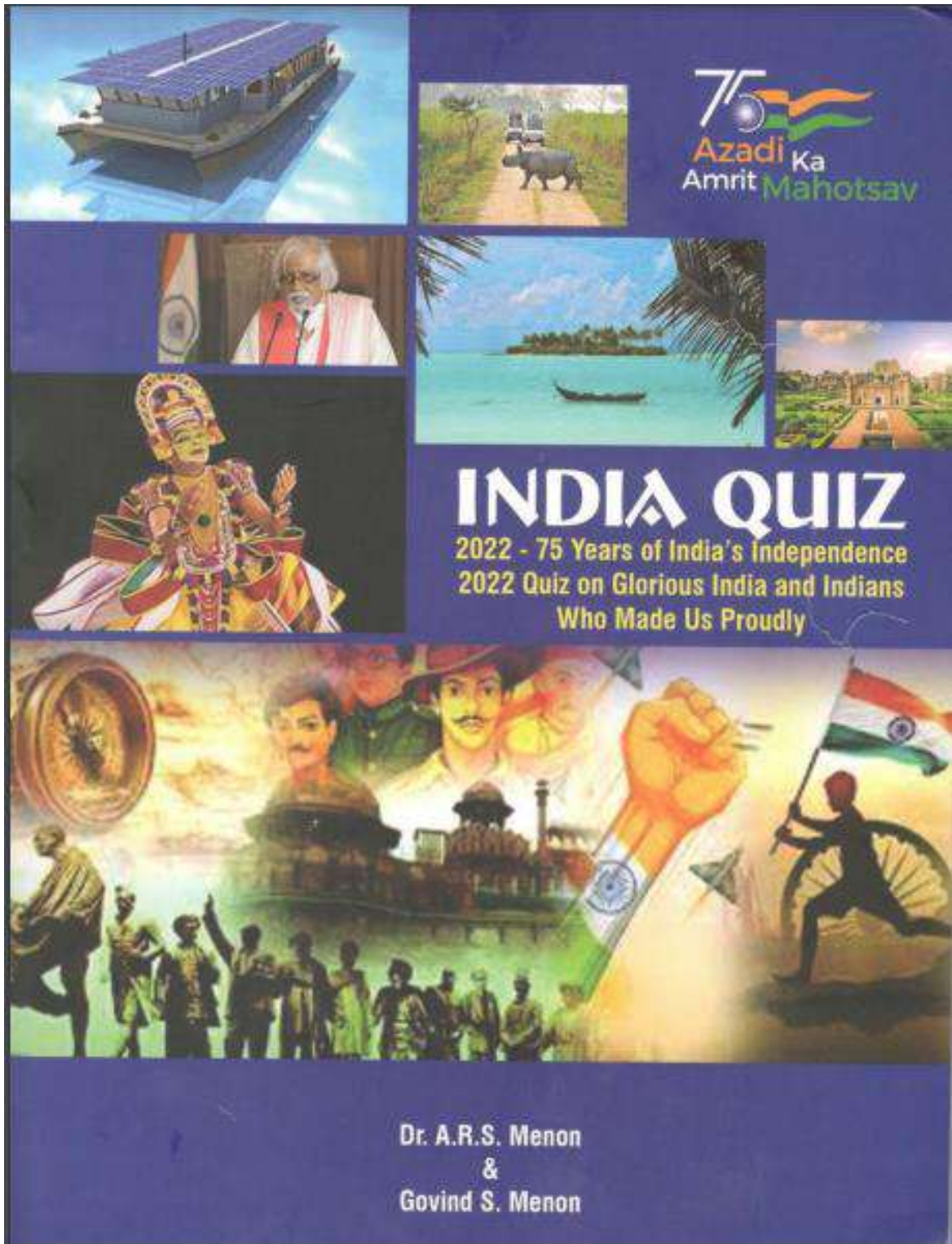
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- Served as the Editor of 'Science India', a popular national science magazine for over a decade
- Currently the Editor of 'Sasthra - The Indian Journal of Science and Technology' (STIJOSAT) - an online bimonthly science magazine
- State Secretary, Swadeshi Science Movement, the Kerala Chapter of Vijnana Bharati, New Delhi
- Recipient of Indira Gandhi Sadbhavana Award for Science Popularization

Govind S. Menon

- Born at Ernakulam, as son of A.R.S. Menon and Sheela Menon
- B.Tech. (Mechanical), M.Tech. (Energy Management), M.B.A (Operations Management)
- Assistant Professor, SCMS School of Technology and Management, Aluva
- Pursing Ph.D. in Engineering at Cochin University of Science and Technology, Cochin
- Eight research publications and Nine popular articles to the credit

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7. Govind S Menon :Development of a photovoltaic thermal collector

Proceedings of the International conference on Sustainable technology and Innovation for Industry 4.0 (icstii 2022) April 21-22, 2022, CUSAT, Kochi, Kerala India.

DEVELOPMENT AND EXPERIMENTATION OF A HYBRID PHOTOVOLTAIC THERMAL (COGENERATION) SYSTEM

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ABSTRACT

PVT system is a hybrid co-generation technology device along with a photovoltaic panel and thermal collector that produces electric and thermal energy simultaneously. The PV module is cooled using the waste heat generated inside the module and ultimately the overall performance of the device increases. Flat plate collectors are easy to fabricate and need less maintenance. Flat plate collectors additionally collect heat from such types of radiation – beam or diffuse. In a PVT device, the heat generated using the photovoltaic is conducted in an Aluminium absorber plate and eliminated by convection using the gliding of water via cooling pipes, and extracting the waste heat from the panel. In this study a Serpentine tube Flat Plate Collector based Photovoltaic Thermal Hybrid system is fabricated and experimented. The electrical efficiency of the PVT system with cooling was found to be 14.96%. The obtained thermal efficiency was 63%.

INTRODUCTION

The photovoltaic-thermal hybrid solar collector (or PV/T) is a system that combines a photovoltaic (PV) module for solar energy conversion and a high-efficiency thermal conversion module that uses a thermal fluid (Raman *et al.*: 2014). Majority of the solar energy is absorbed or reflected in the solar cell. As a result, the operating temperature of the solar cell rises dramatically after lengthy operations. Unglazed collectors have a higher electrical efficiency and reduced convective heat. Flat plate solar collectors are a promising alternative for future, since they are cheap and simple to fabricate. The current studies discuss the technology behind these collectors and traces their development including design and operating aspects such as absorber plate designs, use of novel materials for absorber plate, use of nano fluids for enhancing the heat transfer etc. in accordance to Dobreynal *et al.* (2020). Flat plate collectors are simple to make and require little maintenance (Panthiban *et al.*: 2020). Flat plate collectors gather heat from both beam and diffuse radiation. PV/T is a form of co-generation system technology that absorbs waste heat from a solar panel to provide both power and heat from a single system (Dopeyrat *et al.*: 2011). The current study explains the methodology of Flat plate photovoltaic thermal collector fabrication and experimentation. PVT panel temperature is reduced by the cooling mediums, including air, water, and nanofluid, and the absorbed heat can be utilized for domestic and industrial applications (Haurant *et al.*: 2014; Wang *et al.*: 2019; Dimezi *et al.*: 2019). A PVT system can harvest maximum energy per unit area than a parallelly fixed PV panel and solar govindmenoncu@icstii2022.com

8. Dr Deepa Pillai :Business, Economics and society – the shifting paradigm

**BUSINESS, ECONOMICS,
AND SOCIETY**
THE SHIFTING PARADIGM
(VOL – II)

EDITOR

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DECODING THE NATIONAL EDUCATIONAL POLICY 2020 FOR HIGHER EDUCATION

Dr. Deepa Pillai

Abstract:

Education is an important factor that contributes to the strength of a nation. The prosperity of the nation depends upon the educated individuals. Education makes people independent, confident and bold. Hence it becomes very important for a nation to have a very good educational policy. The realization is that, prosperity of a nation depends upon its educated population, has driven the government to think on those lines. The result is the NEP 2020. This article is an effort to understand the provisions of the various National policies of on education. It also attempts to make a comparison between the existing policy and NEP 2020. Finally it tries to understand main provisions of the National Educational Policy 2020 and how it is poised to bring about a change in the educational landscape of India in future.

Key words: *National Policy on Education 1986, National Educational Policy 2020, Higher Education, Educational Landscape.*

INTRODUCTION

A good education is the foundation for better future - Elizabeth Warren

The words of Elizabeth Warren point out the very importance of education. In fact education is the backbone of a strong nation. People acquire knowledge, values and skills through appropriate

education. This is very important in the development of individuals. Educated people are confident and they are capable of understanding what is right and wrong and guide them in proper way. It is through proper education that they can get rid of the prevailing evils in the society. Education changes the perception of individuals and transforms him into a responsible citizen. Understanding the importance of education, Indian government has taken lot of efforts to bring about a change in the educational system. National Educational Policy 2020 (NEP2020) is an effort to this realization.

Current Educational Landscape

Latest AISHE report says that India has about 993 universities with about 40,000 higher educational institutions (HEIs) and about 10,725 standalone institutions. Of these 993 total universities, around 394 of them are in rural areas, catering to the requirements of students in the rural belt. Similarly, there are about 385 universities under private sector representing a percentage of 38.8 percent. India had about 37.4 million students enrolled for higher education for the year 2019, representing a gross enrollment ratio (GER) of 26.3%. The enrollment ratio for undergraduate courses stood at 79.8 percent and the distance enrollment was about 10.62 percent.

AICTE approved institutions in India stood at 9700 for the year 2020-21. These institutions offered about 4100 undergraduate courses, 4951 post graduate and 4514 diploma courses. India is also the second largest market for E-learning after US. This segment is poised to grow at 1.96 Billion US dollars by 2021 with a total of about 9.5 million users. It is expected that the online education segment in India to reach 11.6 Billion dollars by 2026. With the implementation of NEP2020, India is poised to grow further with quality enhanced.

National Policies of Education at a glance

Since independence, lot of commissions were set up to bring about a change in the education system. Notable among them were the recommendations by University education commission, Secondary Education Commission and education commission. The first National Policy for Education was introduced in 1968 as an effort of the recommendations of the Kothari commission. It aimed at bringing about a radical change in the educational system. Some of the core principles of the National Policy of Education 1968 (NPE1968) were:

1. Free and compulsory education: free and compulsory education for all up-to the age of 14.
2. Status, Education and Emoluments of teachers – Teachers to be honored and respected. Education and quality of teachers were important. Hence efforts were taken to get qualified teachers as well as train them accordingly. They were to be paid adequately. They also had the academic freedom to research and publish
3. Development of languages – a three language formula was established for secondary education-Hindi, English and Regional language. Hindi was adopted as the National Language in line with the Indian traditional culture and heritage. Sanskrit as a language was also encouraged.
4. Equalization of educational opportunity – efforts were taken to remove regional imbalances. Equal education for all. Education for girls and children with special needs were given importance.
5. Science education and research was given priority.
6. To improve the reliability and validity of examinations

The second National Policy for education was introduced in 1986 by then Prime Minister Mr. Rajiv Gandhi. This was later modified in 1992. Some of the highlights of this policy:



1. Focused on improving education for all including women, SC and ST communities.
2. Aimed at expansion of scholarships
3. Adult education saw a promotion during this phase.
4. Efforts to bring ST and ST communities to the forefront and to provide special opportunities for their employment.
5. Special incentive schemes were rolled out to facilitate and encourage poor families to send their children to schools.
6. Setting up of new educational institutions.
7. Open University system was encouraged to educate more people as a result of which the Indira Gandhi Open University (IGNOU) was established.

Some of the drawbacks of the National policy for Education 1986 are:

- Fragmentation of education system
- Mathematics and science were given importance
- Rigid separation of streams and Early specialization
- Limited access to Socially and Economically Disadvantaged Groups
- Less emphasis on learning outcomes and holistic development
- Lesser importance to research.
- Bureaucratic regulatory system.
- Lesser emphasis on career growth and counselling
- Lesser autonomy to teachers and institutes

To overcome the drawbacks of National Policy for Education 1986 and to bring about an overall change in the society, the National Educational Policy 2020 was introduced. The draft policy was submitted by Dr. K Kasturirangan commission on 31st May 2019. This committee was constituted in June 2017 by the Ministry of Human Resource Development. NEP 2020 is poised to overcome the challenges faced by the previous education policy. It



aims at reforming education system at various levels –right from school to higher education. Some of the challenges posed by NPE1986 like – access to education, equity, quality, affordability and accountability have been addressed by the NEP 2020. A detailed discussion on NEP 2020 and its impact has been explained in Table -2 of this article.

Objectives of the study:

This article is an effort to understand the provisions of the various National policies on education post-independence. It brings out the important provisions of various educational policies. It also attempts to make a comparison between the existing policy and NEP 2020. Finally it tries to understand main provisions of the National Educational Policy 2020 and how it is poised to bring about a change in the educational landscape of India.

The following are some of the objectives of this article:

- To understand the NEP 2020 as laid out.
- To compare the provisions of NEP 2020 with that of NPE - 1986
- To decode NEP 2020 for better understanding of higher education.
- To understand its impact on the educational system.

Methodology:

The study includes an understanding of the NEP 2020 policy as a whole. Secondary data has been used in the preparation of this article. The National Policy on Education document for 1968 and 1986 were used to collect information. Similarly NEP2020 document was used extensively to understand the same. Apart from these, various online sources and reports were used to for the preparation of this article.

A comparison of current policy with that of NEP 2020.

There has been a growth in understanding the importance of education since independence. There had been several initiatives

enable students to broaden their horizons and thinking and come up with valuable research. Creativity and innovation is encouraged and this would help in bringing out the latent talent in students. This would also make students more receptive and responsive. Private and public HEIs to provide financial support by way of scholarships, freeships and other aids. This would enable more students to enroll for higher studies particularly the SEDGs. Encouragement of digital and online courses would help increase the GER. Academic Bank of Credits is also a great leap towards a future oriented education. Competency based education, focus on learning outcome , 'graduate attribute ' is sure to improve the employability of students. Internationalization will help improve the domestic standards of education and would drive HEIs to improve competitiveness. Emphasis on qualified people in leadership positions would help HEIs to vision out their future preparedness and stay competitive. Autonomy and flexibility to institutions and faculty will help in bringing an enormous change in the educational landscape. There are no doubts drawbacks in the new educational policy but the positive impact out numbers the negative impact, Thus NEP 2020 would drive India to become one of the top countries to provide quality education at affordable costs.

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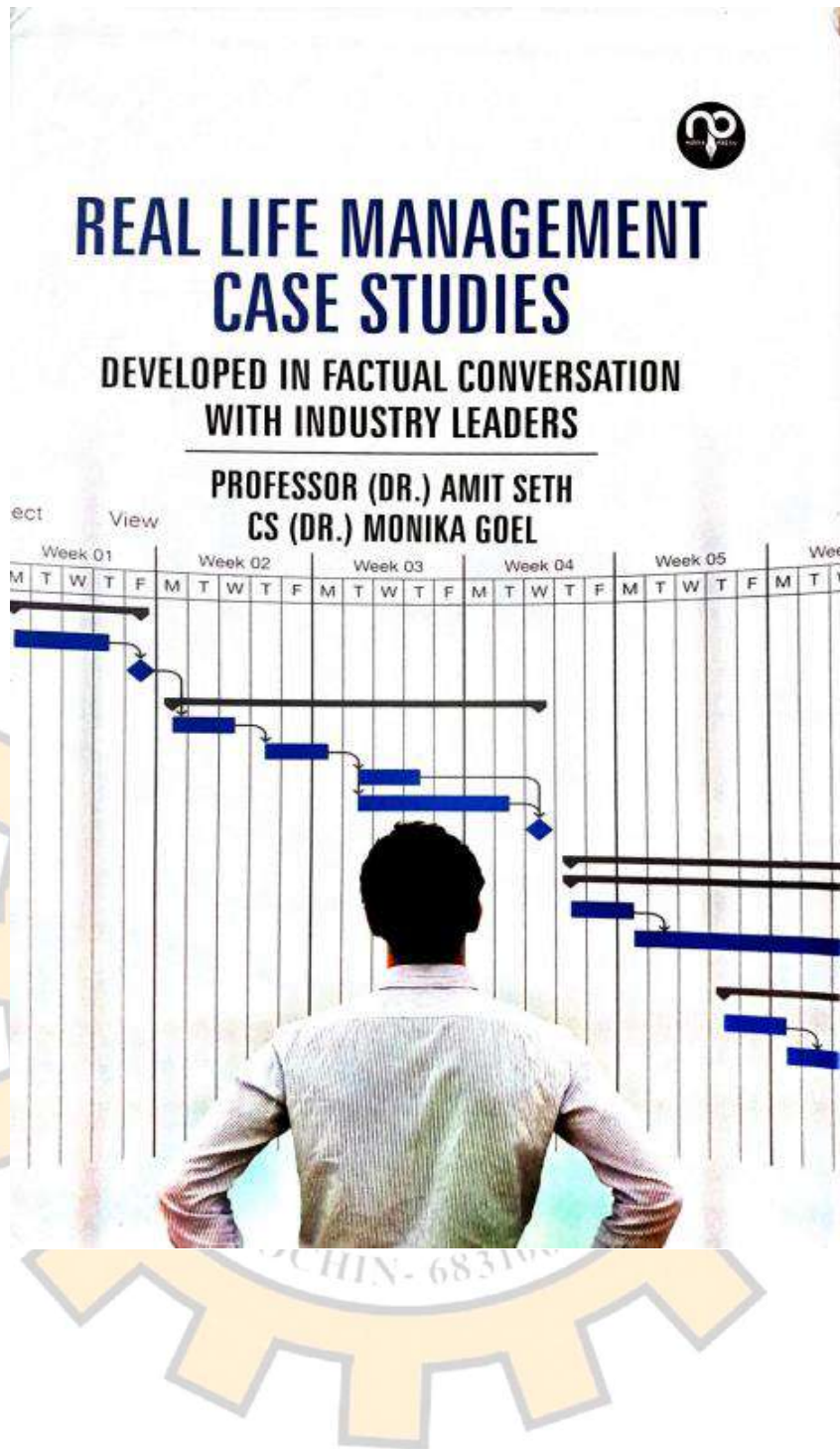
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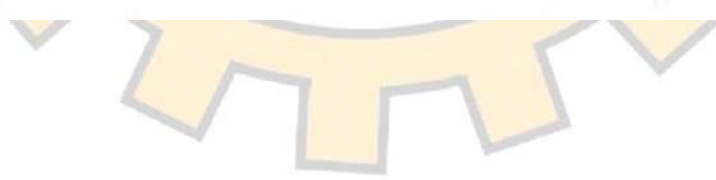


REAL LIFE MANAGEMENT *Case Studies*

Developed in Factual Conversation with Industry Leaders

Editors

Professor (Dr.) Amit Seth
CS (Dr.) Monika Goel



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Sledgehammer – Navigating Challenges Through Innovation

Dr. Subodh Saluja, Dr. Sonal Trivedi, Dr. Shobha Menon, Dr. Deepa Pillai

Abstract

Oil and gas industry need very specific products to meet their requirements at oil wells. There are very few companies in the world that cater to these needs. SledgeHammer found this gap and went to create the products for this oil industry. From having 5 products to offer in 2006 by 2021 they have over 425 product categories and over 1lakh products to offer. SledgeHammer has navigated itself well through the 2008 economic crisis and also the COVID crisis and ensured continuity and growth to their business. This case also pertains to the challenge of high competition faced by the company from low cost local manufacturers, which affected their profit margins. The case is about how the company meets this threat through constant innovation through research and development and leveraging their strengths. They have maintained their position as the market leader in Asian market.

Keywords: Crisis management, Strategy, Innovation, Product Development , Oil and gas industry, COVID19

Introduction

This case describes one of the approaches for teaching with case studies i.e. decision focus case, which was developed by interviewing Sledgehammer Oil Tools Pvt. Ltd team/employees namely Mr. Pradeep Mohanty, Managing Director ; Mr. Ankur Kaushik, Director - Operations; Mr. Pawan Yadav, Sr. Sales Manager; Mr. Angelino Henry- Sales Manager and Mr. Mayank Dixit -Key Account Manager. The secondary data for the case was collected from published reports and websites. This case study is a decision case presenting a strategic decision of Sledgehammer. The case is covering strategic questions for Sledgehammer such as what's going on in Oil and ancillary industry,

what's happening in Sledgehammer and competition faced by company, how different parts of oil and ancillary industries are interacting with each other, how outbreak of COVID19 has affected the company. Thus, this case presents the trends and changes in oil and ancillary industry with specific reference to Sledgehammer Oil Tools Pvt. Ltd.

Company History with Industry Profile

SledgeHammer is a part of one of the oldest industrial groups of India, established in 1974 by a team of qualified engineers and has been involved in activities like steel castings, sheet metal, heavy engineering products etc. They started manufacturing Cementing products in 2006. Now it is a leading API Q1, API 5CT, API 14 L, API 19AC & ISO 9001, ISO 14001, ISO 45001 certified manufacturer of cementing & completion equipment. Starting as a single equipment manufacturing company, SledgeHammer has now grown into a formidable and widely respected organization. SledgeHammer has its footprints in more than 65 countries across the globe with long term contracts with E&P Companies, Operators and service provider companies. In terms of the organization's structure the Operations Director, VP marketing, Finance Director, Supply Chain Director, HR & IT Director, Quality Manager, R&D manager work in sync with each other. All these positions report to the Managing Director, Mr. Pradeep Mohanty. SledgeHammer is the largest manufacturing company of Asia, who has capability of manufacturing almost all standard and non-standard sizes of cementing products. Their tagline is "Commitment towards perfection".

SledgeHammer has Joint Ventures as follows:

1. SledgeHammer Gulf DMCC (Sales Office in UAE)
2. SledgeHammer Oil Tools International (Manufacturing Unit in Kingdom of Saudi Arabia)
3. SledgeHammer Gulf LLC. (Manufacturing facility in Sultanate of Oman - 2015)
4. SledgeHammer Americas LLC. (Sales office & warehousing - USA - 2015.)
5. SledgeHammer Russia (Sales office in Moscow).

Industry Profile

The Modor Intelligence report states that there has been a growth in the ultra deepwater drilling operations in South America, North America, Middle East and Africa as a result of which the oilfield equipment market is expected to register a CAGR of more than 2% by 2025. The report also states that the onshore segment would have a maximum share that would account to a 70% of worldwide oil production. Allied market research report projects that the

global oilfield equipment market size to reach \$ 141,498 Million dollars by 2026. With such an increase in oilfield equipment requirements, the need for oil field accessories is bound to grow substantially.

The process of filling the spaces of the oil well zone with the cement is called well cementing. Cementing accessories are the products that are used in the oil and gas industry for providing cementing solutions. These are used in the casing of various applications and are of various types such as float collars , cementing plugs , float shoes and many more. The growth of this market is linked to the growth of oil exploration activities. This segment is projected to reach USD 11.7 Billion by 2024 from an estimated USD 9.2 Billion in 2019.

Attractive Opportunities in the Well Casing & Cementing Market

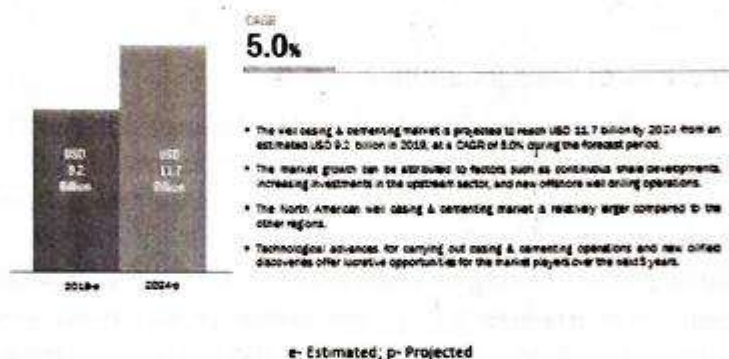


Figure 1: Attractive Opportunities in the Well Casing & Cementing Market

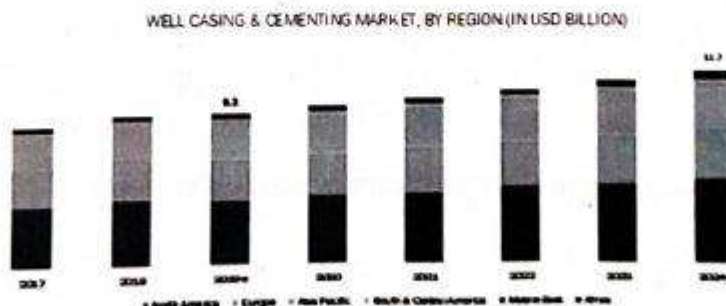


Figure 2: Well Casing & Cementing Market, By Region (In USD Billion)

Some of the key market drivers are -increase in oil exploration activities, aging of oil wells, technological advancements, innovation and skilled labor. Market growth opportunities for well cementing accessories come from increase in oil exploration activities and the innovation advancements. The cement powder used, cause ample respiratory and lung infections. The

increasing rate of these infections have caused the Governments to come up with certain laws that act as a market restraint for this market.

The WBOC report has indicated the following key players in the cementing accessories market:

- Baker Hughes, USA
- Schlumberger, USA
- Weatherford, USA
- Halliburton, USA
- Sledgehammer Oil Tools, India
- Rubicon Oilfield International, USA

The industry is highly competitive due to the presence of a large number of competitors.

Unique Features of Sledgehammer

- It is the only company in India and also the largest in Asia that has the capacity to manufacture the complete line of cementing products.
- 40% of the cementing equipment, available in the international markets are manufactured by them.
- It takes pride in having a maximum number of designs under one roof.
- Customer satisfaction is its prime motto. As such it gives importance to the customized requirements of the customers, may it be the requirement for a single product.
- It has the Customization capability to manufacture even non-standard sizes.
- It has world class testing facilities.
- It has its own Research and Development team.
- Has manufacturing facilities in India, Malaysia, KSA and Oman

Key Recognitions and Certifications of Sledgehammer

- API Q1
- API 5CT
- API 14L
- API 19AC
- ISO 9001
- ISO 14001
- ISO 45001
- SONCAP

Organization Structure of Sledgehammer

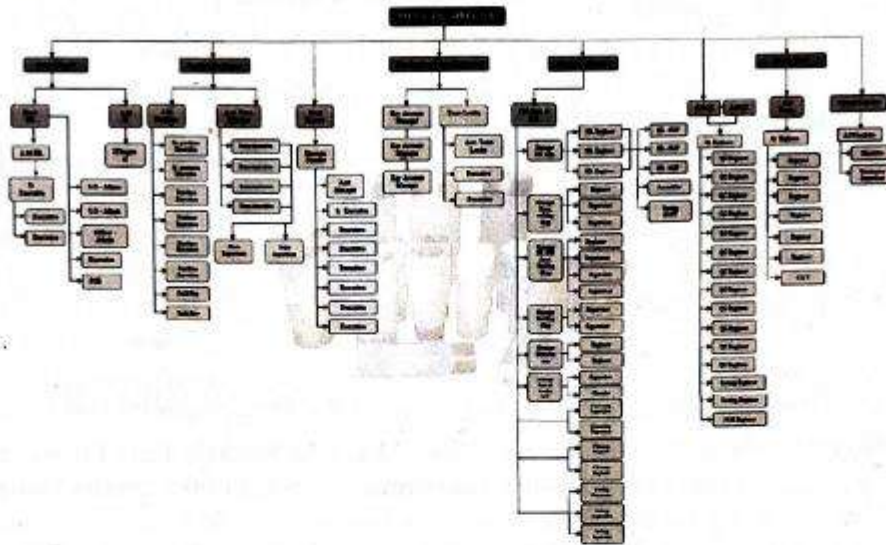


Figure 3: Organization Structure of Sledgehammer

Recent Developments, Products and Services offered

In the international market specifically, the USA for bidding the clause used to be that No Chinese and Indian bidders can participate in the Bid. There was a need to scale up the quality of the product being manufactured. Sledgehammer developed a strong R&D department to constantly innovate and come up with quality products each time. The team went to Indian Oil companies like ONGC and visited their sites to know about the requirements of the industry and understand better what is the need of the Oil market. Sledgehammer ensured that the product manufactured was world class and matched the requirements of the consumer.

Initially Sledgehammer started with 5 products in 2006 and they have 723 product categories and approximately one lakh unique products in 2021.

Products manufactured at Sledgehammer include various bow spring centralizers, solid rigid centralizers, stop collars, cement baskets, float equipment, stage cementing tools, cementing plugs, cementing heads, cross coupling cable protectors, centralizer sub, Cement Retainers / Bridge Plug, Packers, Expansion Joints, API modified High Pressure Thread Compound, Sledge Lok II, Thread Lock and others.

When the contract is signed the duration is from 5 years to 10 years.

In case there is any cost increase most of their contracts do not have the price escalation clause.

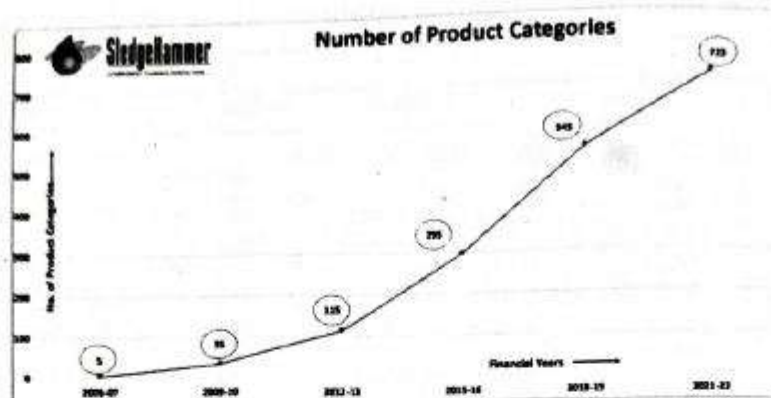


Figure 4: Number of Product Categories (Year 2006-07 to 2021-2022)

Sledgehammer developed the sales market in Middle East Oman and Kuwait, Saudi Arabia 60% and 40% other countries. 90% of the products made by Sledgehammer are exported.

Sledgehammer in order to ensure delivery of product to the customer had to sometimes send the product using air transport instead of sea route to ensure timely delivery of the product. The additional cost of sending cargo by air was absorbed by Sledgehammer.

The challenge for Sledgehammer was to survive and grow. The leadership decided to ensure customer satisfaction through on time delivery of the product. There was a decline in profitability due to increased costs of raw materials during the COVID19. Delivery of raw materials from China took two months to arrive. Sledgehammer decided to source the raw materials from vendors from other countries like UAE. Sledgehammer also negotiated for lower prices from their local sub vendors thus ensuring sustainability of both its vendors and self.

Sledgehammer could penetrate the US/European market due to the international certifications of quality and the appreciation letters of the existing clients of Sledgehammer and the considerable cost advantage. For example, a product costing \$20 in the USA would cost \$12 if manufactured from India ensuring the quality is same as in the USA. This proved to be a blessing for the company in the year 2008 when the world was going through an economic recession.

Developing a new product from research and development takes around 3 to 4 months. Sometimes Sledgehammer received an order for one product item only. The organization displayed agility to respond to the customer requirements, developed the new product and ensured timely delivery to the customer.

How Sledgehammer Creates Value for Its Customers

Sledgehammer has created good relations with its suppliers and has a

incentive for its clients. This assisted the organization with making due during the hour of lockdown during the flare-up of COVID19. The organization requested its vendors to extend its credit period and proceeded for smooth tasks without necessity of any functioning capital credits.

Sledgehammer likewise increases the value of its clients by its activity and creation frameworks set up. To add value here, Sledgehammer lessens grating any place conceivable in the changes that convert contribution to result, or find new cycles or highlights that make the finished result more significant. For example, during the time of pandemic, to lessen its functional expense, the organization altered its design of the item by decreasing the prerequisite of unrefined substances.

Sledgehammer banks on the strategy of "What starts perfect ends perfect" and this has been profoundly inserted in their functioning methodology and cycles. The foundation of assembling and the executives rehearsing in adherence to the worldwide full scale patterns and standards on Quality confirmation/ Quality Control has been an incredible accomplishment for them. Pre and after creation recreation and irregular testing has been the trademark and custom at SledgeHammer .It has assisted them with producing subjective products and supported their QA capacities. The recreation and testing is completed at different levels, for example starting phases of production planning with the assistance of modern 'Centralizer Placement Software' , 'Stand-off Calculation Software' which is supplemented with execution testing according to API RP 10 F suggested testing section. Their QC research centers are completely furnished with the most current and refreshed burden test gear (mechanical, pneumatic and water powered) to fundamentally investigate every part of the device. To maintain this quality, Sledgehammer has majority of its operations in house and does not depend on outsourcing. Additionally, it has its various operations fully automated and few semi-automated to reduce human errors.

Sledgehammer is known for conveying its item to its clients on schedule. As the organization significantly exports its items and has domestic sales additionally, most pieces of transportation and distribution happen through streams from the ports of Nhava Sheva (Mumbai) and Mundhra in Gujarat. In the event of a crisis, the item is moved through aviation routes moreover. In the event of domestic sales, it significantly transports through roads. Moreover, Sledgehammer bear the cost of transportation of its raw materials also.

Sledgehammer enhances its clients through its showcasing by giving clarity and data about their item or administration to its clients , just as giving items according to the necessity of the client. To expand this value, the organization guarantees its clients are focused on with explicit and important items, and ensure their promoting and outreach group are adjusted in their informing, with a full comprehension of the item value . Building good customer relations is likewise a key way embraced by the organization to enhance its clients,

bringing about clients feeling more joyful with their buy and they believe they can trust the organization and the item.

There are different inside tasks which support the organization to offer some benefit to its clients. For example, assets can immediately become costly, for example, an expansion in cost of raw material like steel, and this expense is generally borne by consumers. However, Sledgehammer has tracked down a harmony among reasonableness and quality. Increased production cost will in general incredibly diminish overall revenue, so the organization has tracked down ways of decreasing expenses by changing the plan yet not thinking twice about quality or moving the expense for buyers. Furthermore, the organization has excellent gifted specialists which builds the worth of any remaining exercises and makes an upper hand. Besides, the organization has added esteem from its nonstop advancement and improvement; observing new things that add esteem. One might say that Financial preparation, encouraging associations with financial backers, and refining the executives rehearses have added to expanded worth of the organization.

Issues and Challenges Faced by the Organization

There are different issues and difficulties faced by Sledgehammer. For instance, the steel costs in India have multiplied in the previous year. The value flood reflects a comparative convention in worldwide steel costs. Sledgehammer has been associated with exercises like steel castings, sheet metal, weighty designing items and so on and they began fabricating Cementing items in 2006. Clearly, the greater expenses will cause Sledgehammer to consider hardware and material expenses with more investigation to adjust spending plan sheets. However, it has impacted the overall revenue of the organization. Besides, Sledgehammer is confronting rivalry from nearby merchants. Sledgehammer Oil Tools Pvt. Ltd competitors are the Indian and Chinese manufacturers. This extreme contention can restrict benefits of Sledgehammer and lead to serious moves, including cost cutting, expanded publicizing uses, or spending on assistance/item upgrades and development.

Moreover, the Government of India has forced severe quality control measures and higher levies on imports from China. Sledgehammer had (In Pre-COVID times) 75% reliance on China for raw material like seamless steel pipes. The organization immediately moved its reliance from China and began bringing in unrefined components from Dubai, UAE and so on. Presently (Year 2021) the reliance on China for unrefined components has decreased to 40%. In any case, the reliance on China for unrefined components is difficult for the organization. Additionally, Haryana state government law giving 75% reservation to local people in private positions will come into power from January 2022. The Haryana Government on Saturday said that the Employment of Local Candidates Act, 2020 will be executed in the state

Q4. What strategies do you recommend for SH to increase revenue?

Answer: Some of the strategies that can be thought of

- Diversifying into new areas so that they are not totally dependent on the oil and gas industry.
- Finding customers in India e.g. Indian companies undertaking drilling in the Indian subcontinent. There are only a few customers. But this will diversify their customer base.
- Cutting cost of production with more innovative technologies.
- Full digitization/automation and use of technologies like AI and robotics which will help the company to become more efficient in use of resources and cost efficient. They can even integrate their systems with their clients for a seamless delivery.
- Long term contracts with escalation clauses for areas where costs are expected to be very volatile.

Theory

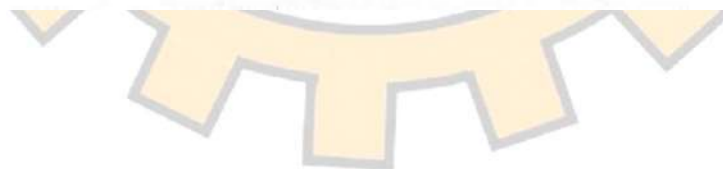
1. Porter's Five Forces is a framework for analyzing a company's or an industry's competitive environment. According to Porter, there are five forces that represent the key sources of competitive pressure within an industry. They are rivalry among competitors, bargaining power of suppliers, bargaining power of customers, the threat of substitute products and threat of new entrants.



2. Porter's value chain includes five essential exercises: service; marketing and sales, outbound logistics, operations, and inbound logistics. Support exercises are represented in an upward section over the essential exercises as a whole. These are procurement, HR, firm infrastructure and technological development. The Porter's value chain model outwardly addresses movements of every sort with equivalent

weight. In any case, esteem chain investigation accentuates the genuine requirements of the organization. When utilizing Porter's value chain, one should recognize whether you are attempting to separate or lower costs, focus on the progressions you distinguish during examination, and consider how changes will help the whole association.

3. Competitive advantage alludes to factors that permit an organization to deliver labor and products preferable or all the more efficiently over its adversaries. These elements permit the useful element to produce more deals or better edges looked at than its market rivals.
4. For any company, its core competency alludes to the capacities, information, abilities and assets that establish its "characterizing strength." An organization's center capability is unmistakable, and accordingly not effortlessly reproduced by different associations, regardless of whether they're existing contenders or new contestants into its market. An organization's center skills - now and again called center capacities or unmistakable abilities - clarify what it can show improvement over some other organization, and why. These capacities give a solid establishment from which the business will convey worth to clients and partners, take advantage of new freedoms and develop.





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Phylogenetic Prediction of Viral Strains

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and Sachinandadas ²**

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² Department of Molecular Biology and Genetic Engineering, College of Basic Science and Humanities, G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand.

Abstract:

Phylogenetic analysis shows how a family of related sequences was derived during evolution. Phylogenetic analysis attempts to group sequences with similar substitution patterns to reconstruct a phylogenetic tree. For example, imagine that we have two sequences that are related to each other. An ancestral sequence can partially be derived from these two sequences. With more similar sequences, more information can be gathered to complement a correct derivation and evolutionary history. For a number of genes, phylogenetic analysis can help determine which genes are likely to have equivalent functions. Used to track changes that occur in a rapidly changing species such as a virus. Take the flu, for example. By studying the rapidly changing genes through phylogenetic analysis, exposure for the next several years can be predicted and a flu vaccine can be developed. The prediction is not always correct, but it does offer some protection against the coronavirus, such as the development of vaccines against pandemic diseases..

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Identification of association between the multimorbidity and Covid-19 using an evolutionary machine learning approach

**Dayana Benny¹, Fulvio Ricceri^{1,2}, Mario Giacobini¹, Roberto Gnavi²,
Giuseppe Costa^{1,2}**

University of Turin, Italy¹, Unit of Epidemiology, Regional Health Service, Italy²

Abstract:

This study identifies how best to distinguish the risk for Covid-19 infected people who have multiple medical conditions by analysing history of drug utilisation (ATC codes (Anatomical Therapeutic Chemical classification system)) and diseases diagnosed (ICD codes (International Classification of Diseases (ICD))) alongside their characteristics such as age and sex. Rare features such as least occurring diseases and drugs in the data may pose a significant challenge for both statistical and machine learning analyses because of their lower prevalence in data and they offer a limited detection power since the dataset is sparse. We used evolutionary algorithm (EA) for finding the comorbidity features that are associated to the hospitalization of Covid-19 patients including the less prevalent features.

A total of 12793 patients who tested positive for the first time for Covid-19 in Piedmont (Northern Italy) are considered in this study. Since the drug utilisation also linked to comorbidities, we use the absence and presence of most frequently occurring drugs and diseases in the study population as multimorbidity features including their age and sex. Separate analysis is performed for population aged 45-59 years (called Group 1 (G1)) and 60-74 years (called Group 2 (G2)).

Relevant Association Rare-variant-bin Evolver (RARE) algorithm is applied in G1 and G2 data and top bins are obtained based on accuracy score of that bin. Later, the multimorbidity features which belongs to the bins with more association to the Covid-19 hospitalization outcome are identified after the execution of the algorithm. First results highlight the role of some ATC codes: C08CA (dihydropyridine derivatives), G04CA (alpha-adrenergic receptors antagonists), M04AA (Preparations inhibiting uric acid) and A10BA (blood glucose-lowering drugs biguanides) occurs in all iterations for G2. Also, M04AA and G04CA appeared most of the times in G1.

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REVA-UMS-031: Molecular Docking Analysis of Apigenin against Bacterial FtsZ gene.

Gayana Shaji, Deepthi D C, Harish M and Nair S

¹SCMS Institute of Biosciences and Biotechnology Research & Development, South Kalamassery, Cochin-682033, Kerala, India.

*Corresponding Author: gayanashajigayana@gmail.com

ABSTRACT: The emergence of multiple drug resistant microorganisms is a serious and worldwide problem that has prompted research into the identification of new biocides with broad activity. Phytochemicals from medicinal plants are known to have an extended history for effective treatment against various pathogens and infections. The genus *Ocimum* consists of aromatic herbs and shrubs which have medico-botanical importance. Apigenin is a major bioactive compounds found in *Ocimum* species. Filamenting temperature-sensitive mutant Z (FtsZ) gene encoded FtsZ protein that assembles at bacterial cell division site and forms Z-ring structure. FtsZ is a tubulin homolog protein with low sequence similarity; hence it is possible to inhibit bacterial FtsZ protein without affecting the eukaryote cell division. In the present study, apigenin was virtually screened for their antibacterial activity against selected gram positive and gram negative bacteria's cell division protein, FtsZ. In silico molecular docking were carried out using Patch dock to investigate the effect of apigenin as a new lead inhibitor against bacterial cell division protein FtsZ. Docking studies and secondary structure prediction of the FtsZ gene of bacteria revealed that apigenin has higher binding affinity with the FtsZ gene and also bound near to the active site of the gene. Thus, the current study presents an experimental validation of antimicrobial activity and potential of apigenin as a lead anti-microbial molecule.

REVA-UMS-032: In Silico prediction of new drug candidate from Piper nigrum against bacterial MurA gene.

Aswathy PV, Kurian Anoja, Deepthi D C, Harish M and Nair S

¹SCMS Institute of Biosciences and Biotechnology Research & Development, South Kalamassery, Cochin-682033, Kerala, India.

*Corresponding Author: aswathypv535@gmail.com

ABSTRACT: The use of medicinal plants to cure various diseases dates back to ancient civilizations. *Piper nigrum* or Black pepper is the most well known species with its various useful pharmacological properties. Black pepper is one of the most valued and widely used spices in the world and dominates multi-billion dollar global spices trade. It is also considered as a valuable source of various bioactive constituents. Piperine or piperic acid was isolated from fruits of *Piper nigrum* and had been reported as pharmacologically valuable bioactive constituents. In this study, Piperine was evaluated for its antibacterial activity against selected gram positive and gram negative bacteria's MurA protein. UDP-N-acetylglucosamine enolpyruvyl transferase (MurA), which catalyzes the first committed step of bacterial peptidoglycan biosynthesis, is a prime candidate for therapeutic intervention. Molecular docking was carried out to study the molecular interactions and binding affinities against the protein MurA, which is an essential enzyme for the synthesis of

peptidoglycan in cell wall. In silico molecular docking studies were carried out using Patch dock and Chimera. Compound piperine exhibited antibacterial activity along with a high docking score of -5.92kcal/mol. It also showed higher binding affinity to the selected bacteria except *S. aureus*. Thus, the present study proposes piperine as a potential antimicrobial candidate, significant in the age of multi drug resistant bacterial pathogens.

REVA-UMS-033: Molecular interaction between Wolbachia pipientis and Tomato Leaf Curl New Delhi Virus in B. tabaci vector and its potential in combating TLCV.

N.M. Guruprasad^{1*}, C.N. Prashantha¹, R. Ramachandra¹, Uday J²

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²Good Will Group of Educational Institutions, Hegganahalli, opp. Milk Dairy Stop, Bengaluru- 560091 India.

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ABSTRACT: Wolbachia competes with the virus for resources, reduces the pool of cytoplasmic amino acids to a point that interferes with translation of viral proteins and triggers cell autonomous mechanisms of resistance by actively interfering with virus replication in co-infected cells. Genes encoding proteins with ankyrin repeats, involved in protein–protein interactions, are over-represented in the Wolbachia genome and are good candidates for mediators of anti-viral resistance. The coat protein (CP) is the only virus-encoded protein required for vector-mediated transmission. The protein modeling and insilico docking of coat protein with Wolbachia wall surface protein in the present study determines the interaction between the virulent Wolbachia pipientis and the begomovirus, ToLCNDV aiming to prevent its persistence in its whitefly vector, *B. tabaci*.

REVA-UMS-035: Isolation, prediction and Insilico characterization of phytochemicals from the source of herbal extract for the potential target to throat cancer.

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ABSTRACT: Colorectal cancer is the second common cancer deaths in the world population. The WNT signaling pathway will play a critical mediator for embryogenesis, tissue homeostasis and repair during the development of tumor. There are several chemotherapeutic drugs helps to inhibit the WNT signaling receptors to control embryogenesis and homeostasis. With the rapid progress of drug discovery and development, several phytochemicals are most popular to become anticancer effects. Vitex negundo (L.) has anticancer, anti-inflammatory, antiseptic, astringent properties. The aim of this study is to investigate phytochemicals that are present in V.negundo (L.) extract gas potential inhibitor to the WNT signaling



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trending in healthcare research. Phytochemicals proves to have great potential in this regard as they are pleiotropic in their function and target complex multiple signalling events of cancer. Hence, they are most suitable candidate for anticancer drug development. Also, they act differently on cancer cells without altering normal cells. Curcumin is known to have anti-cancer activity due to its phenolic constituents. It suppresses proliferation and metastasis of human tumors through regulation of various transcription factors, growth factors, inflammatory cytokines, protein kinases and other enzymes. Pharmacokinetic data has shown that curcumin undergoes rapid metabolism leading to glucuronidation and sulfation in the liver and excretion in the feces accounting for its poor systemic bioavailability. Hence the present study was conducted to detect possible natural analogues of curcumin (Capsaicin, Chlorogenic acid, Ferulic acid, Zingerone, Gingerol) which are effective against breast cancer receptors and prove the ethno-medicinal value of these analogues using bioinformatic tools and software's like PDB, Patch Dock, PubChem, Chimera and My Presto. Out of the various curcumin analogues studied, Ferulic acid showed best binding affinity with all the breast cancer cell specific receptors (FGF, MMP9, RNRM1, TGF-beta, DHFR, VEGF and aromatase) which was confirmed through the docking studies. The current work was a preliminary step towards screening suitable drug candidate against breast cancer, confirmed through in silico methods. This information can be used further to carry out In vivo studies considering Ferulic acid which is an analogue of curcumin as a suitable drug candidate against breast cancer.

REVA-UMS-030: Anti-inflammatory action of quercetin against Cyclooxygenases-1 enzyme, an In-silico approach.

Meghana PM, Harish M and Nair S

¹SCMS Institute of Bioscience and Biotechnology Research & Development (SIBB R&D)S.Kalamaserry, Cochin-33, Kerala,India.

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ABSTRACT: Quercetin is a flavonoid that belongs to the flavonol class of compounds, has many pharmacological activities, and in order for any clinical application, it is important to evaluate the safety of the compound. Cyclooxygenases are key enzymes in lipid signaling. They catalyse the first step in the production of prostaglandins, important mediators of inflammation, pain, cardiovascular disease, and cancer, and they are the molecular targets for non-steroidal anti-inflammatory drugs, which are the oldest and most chemically diverse set of drugs known to date. The objective of this study was to evaluate the potential of quercetin as anti-inflammatory agent against COX genes. The In-silico analysis showed that, quercetin binds at THR212 of Cyclooxygenases-1 enzyme and produces more binding affinity, -5.91 Kcal/mol than that of diclofenac, -3.2 Kcal/mol, an established ant inflammatory drug. Moreover, the lethal dose level of quercetin is three times higher than that of diclofenac, which a good edge for the standardization of dosage of quercetin as a potential drug candidate for the treatment of inflammations, especially when most of the emerging viral diseases like COVID19 have inflammatory consequences.



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in the release of arsenic to the environment. Geological sources of arsenic release includes weathering of arsenic-containing rocks and volcanic activities. Conventionally arsenic is remediated from the environment by membrane filtration, ion-exchange, oxidation, adsorption, coagulation and flocculation techniques. However, remediating arsenic using these techniques involve high costs and release of hazardous sludges. Thus, involvement of biological methods in removal of arsenic from polluted environment has drawn attention of scientists. Application of heavy metals resistant microbes in remediation of arsenic can be considered as stable as well as economical alternative to the conventional techniques. This review article focuses on the hazardous impact of arsenic on environment and methods of bioremediation of arsenic.

REVA-UMS-028: Nanoparticle sensors: A potential solution towards understanding the agriculture-based pollution.

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ABSTRACT: Humans are dependent on agriculture for food both directly and indirectly. With increase in global population, the demand for food has increased, while the availability of land and resources have decreased. To ensure maximum yield with the available resources, several pesticides, fertilizers, and chemicals are applied to the crops, which in turn results in pollution and eco-toxicity. Proper monitoring of these residual chemicals in food requires engagement of new modern technology in agricultural sciences. Nanotechnology has beneficially impacted agriculture in several aspects through revolutionized tools for better yield management, smart delivery system for pesticides, detection of excessive chemicals and for disease monitoring/treatment. This review article discusses about various agricultural pollutants, their ecotoxicity aspect and applicative potential of nanometric sensors like silver and gold nanoparticles towards detecting them.

REVA-UMS-029: Identifying the potential role of curcumin analogues as anti-breast cancer agents an In silico approach.

Praseetha N G, Divya U K and Nair S

¹SCMS Institute of Bioscience and Biotechnology Research and Development

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ABSTRACT: Cancer is a major public health problem that has a significant global impact on both developed and developing countries. Breast cancer ranks top among newly reported cancer cases and constitute a major portion of cancer in women. Development of target therapy which is effective with minimal side effects is

trending in healthcare research. Phytochemicals proves to have great potential in this regard as they are pleiotropic in their function and target complex multiple signalling events of cancer. Hence, they are most suitable candidate for anticancer drug development. Also, they act differently on cancer cells without altering normal cells. Curcumin is known to have anti-cancer activity due to its phenolic constituents. It suppresses proliferation and metastasis of human tumors through regulation of various transcription factors, growth factors, inflammatory cytokines, protein kinases and other enzymes. Pharmacokinetic data has shown that curcumin undergoes rapid metabolism leading to glucuronidation and sulfation in the liver and excretion in the feces accounting for its poor systemic bioavailability. Hence the present study was conducted to detect possible natural analogues of curcumin (Capsaicin, Chlorogenic acid, Ferulic acid, Zingerone, Gingerol) which are effective against breast cancer receptors and prove the ethno-medicinal value of these analogues using bioinformatic tools and software's like PDB, Patch Dock, PubChem, Chimera and My Presto. Out of the various curcumin analogues studied, Ferulic acid showed best binding affinity with all the breast cancer cell specific receptors (FGF, MMP9, RNRM1, TGF-beta, DHFR, VEGF and aromatase) which was confirmed through the docking studies. The current work was a preliminary step towards screening suitable drug candidate against breast cancer, confirmed through in silico methods. This information can be used further to carry out In vivo studies considering Ferulic acid which is an analogue of curcumin as a suitable drug candidate against breast cancer.

REVA-UMS-030: Anti-inflammatory action of quercetin against Cyclooxygenases-1 enzyme, an In-silico approach.

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ABSTRACT: Quercetin is a flavonoid that belongs to the flavonol class of compounds, has many pharmacological activities, and in order for any clinical application, it is important to evaluate the safety of the compound. Cyclooxygenases are key enzymes in lipid signaling. They catalyse the first step in the production of prostaglandins, important mediators of inflammation, pain, cardiovascular disease, and cancer, and they are the molecular targets for non-steroidal anti-inflammatory drugs, which are the oldest and most chemically diverse set of drugs known to date. The objective of this study was to evaluate the potential of quercetin as anti-inflammatory agent against COX genes. The In-silico analysis showed that, quercetin binds at THR212 of Cyclooxygenases-1 enzyme and produces more binding affinity, -5.91 Kcal/mol than that of diclofenac, -3.2 Kcal/mol, an established ant inflammatory drug. Moreover, the lethal dose level of quercetin is three times higher than that of diclofenac, which a good edge for the standardization of dosage of quercetin as a potential drug candidate for the treatment of inflammations, especially when most of the emerging viral diseases like COVID19 have inflammatory consequences.