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9	Preparing Industrial Revolution 4.0 (IR4.0) Ready Graduates	Dr. Hemlata Gaikwad Dr. Sushma Kulkarni	Journal of Engineering Education Transformations	April 2020	Special issue, Volume 33 Pp:26 -30	RIT

Mind Mapping: An Effective Teaching Learning Evaluation Tool in Engineering Education.

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Abstract:

Active and collaborative Teaching – Learning activities are practiced in outcome based education system. Mind mapping tool is a creative tool, which keeps students engaged and simultaneously active knowledge representation materialize. Mind mapping also helps teachers to evaluate effectively the students' knowledge gain. The Mind Mapping activity was conducted for Final year students of ETC Department, RIT. The results are verified statistically and the outcomes are measured through rubrics.

Keywords: Mind Mapping, Evaluation Tool, Rubrics, teaching.

1. Introduction

In recent scenario, it is observed that it becomes very difficult for a teacher to handle large classroom of 60 to 70 students to understand their knowledge gain. Hence the use of mind mapping enables the teacher as well as the students to gain a simplified method of teaching – learning resulting to a win-win situation for both the parties. This technique brings out the creativity and productivity of the students.

It is noticed that mind mapping supports the teachers to evaluate the learning gained by the students within a very short duration. For this activity, it is very important that the question framing should be focusing on deep learning and bounded to the course. As well as the faculty should take, care to design rubrics in a well-framed manner. Hence, we can conclude that Mind mapping helps both course owners as well as the students to gain quick review of whole course within a very short span of course material.

1.1. Objectives:

- Promote active and collaborative teaching, learning tool
- Engage students with fun learning.
- Promote rubric evaluation of learning

2. Literature review

Omue Kizilgol, Burcu Isguden Kilic, Hasan Abdioglu, (2016) In the paper titled - The effects of using the concept mapping and the traditional method on the academic achievement of students in learning the fundamental topics of cost accounting the authors have made a study on the comparison of the effects of using the concept mapping and the traditional method on the academic achievement of students in learning the fundamental topics of cost accounting. Also the author opined that the knowledge gained through concept mapping make students learn in a very ambitious and consistent manner.

Shraddha, Raghvendra, Nikita, Nalini, Ajit (2015) The authors in their study on Mind mapping: An useful technique for effective learning in large classroom, have opined that the Mind mapping technique proves to be very efficient and effective for the ability of the student for interactive learning to improve retention and reduce revision time. The authors have specified that the major important positive outcome of the experiment is that maximum number of students have clearly indicated that this technique has given them a very good opportunity to evaluate, work on and improve their ability for interactive learning.

Bang Khanh Nong, Tuan Anh Pham, Thy Nu Mai Tran (2016) in the study on the topic "Integrate the Digital Mind mapping into Teaching and Learning Psychology" authors have studied about the difference between digital mind mapping over paper-based mind mapping and conventional teaching method on students academic achievement and attitudes in teaching and learning also its effects are studied herewith. The authors in this paper are of the opinion that there is a noteworthy difference in the academic achievement of students' as well as the attitudes towards learning is positive through the computer-based teaching and learning mind mapping method.

Joanne Broggy, George McClelland, (2009) The paper titled - Integrating concept mapping into higher education: A case study with physics education students in an Iris University, attempts to map the students engaged in meaningful learning. According to the authors, the study suggests that Concept Mapping can serve as a valuable tool in physics education by helping students to understand the complex concepts in a more better manner, link themselves to new knowledge and represent their understanding of those complex concepts in a easy way.

Cui Jingjing (2016) In this paper titled - The application of mind mapping in foreign language teaching advances in social science, education and humanities research, the author through his study is of the opinion that Foreign language learner's thinking ability can be enhanced by mind mapping, as well as stimulate the learner's association to think out of box. According to the authors, mind mapping "classroom - based" teaching model can encourage the development of students' divergent thinking ability and the formation of a new teaching and learning strategy.

Shaimaa Salah Abbas, Ahmed Sharaf Eldin, Adel Elsayed, (2018) The authors of the paper titled - The effect

of concept mapping and mind mapping utilization on students' understanding level: an empirical study, are of the opinion that the technique of mind mapping would significantly affect learners' understanding level and speed. The results of the study show that such knowledge representation methods have positively affected students' perception about the understanding of key concepts implicit in challenging texts in an easy and better way than the traditional methods of learning.

Genevieve Zipp, Catherine Maher, (2013) The authors of the paper titled - Prevalence of mind mapping as a teaching and learning strategy in physical therapy curricula, are of the opinion that the Mind mapping technique uses a multi-sensory learning approach, which can support a student's ability to explore associations amongst information. The authors suggest in their paper that although this technique is not widely used in the physical therapist courses, it should be introduced and widely published to support the academics and enhance learning ability of students.

Kenesha Wilson, Eddia Copeland-Solas, Natalie Guthrie-Dixon, (2016) The authors in the study on - A Preliminary Study on the use of Mind Mapping as a Visual-Learning Strategy in General Education Science classes for Arabic speakers in the United Arab Emirates, demonstrate that mind mapping technique provide a quick way to highlight student misconceptions and knowledge gaps. The study also portrays that students are enthusiastically responsive to the technique of mind mapping, they have become engaged in the course and as such take pleasure in learning the course. The authors say that the main success of this mind mapping technique is that, the students are able to discuss and organize their thoughts externally along with their peers.

3. Problem Identified:

- Effective summary writing of chapter was not done by students
- Faculty does not evaluate the knowledge gain by students of every chapter.

Visual writing is more effective than normal summary writing. Visual writing clears the concepts of knowledge with interconnection and takes little time to write or draw. The evaluation is easy compare to normal summary writing.

4. Research Methodology:

The effective evaluation teaching learning tool was implemented at Rajarambapu Institute of Technology. Faculty does the analysis of every chapter. The visual drawing or mind mapping was used for analysis of student's knowledge gain of every chapter and finally the course. The mind mapping was done for all the six units one after the other. After this final mind mapping of the whole course was conducted at the end of the semester. The evaluation of knowledge of students is done first evaluating the every mind mapping. The data analysis is done on mind mapping. The statistical analysis tool was applied to test the hypothesis

finalized by faculty. For statistical analysis the chi-square test and variance among the mapping is tested. For analysis the variables used are core words used, branches linked, sub point included, application listed, interpretation of points.

5. Mind Mapping:

The concept of mind mapping is graphical representation of knowledge. It benefits students to recall, create new concepts, blend, comprehend and analyze the contents in one diagram. There are four types of mind mapping:

1. Process Mind Mapping,
2. Idea Mind Mapping,
3. Information Mind Mapping and
4. Application Mind Mapping.

The drawings of Mind Mapping is divided into two types, one is using software and other type is hard Mind Mapping using sketches as shown in below mentioned figure.

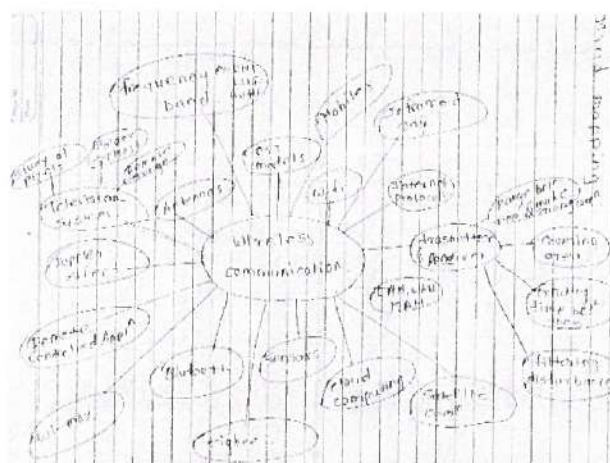


Fig.1. Mind Mapping of wireless Communication1

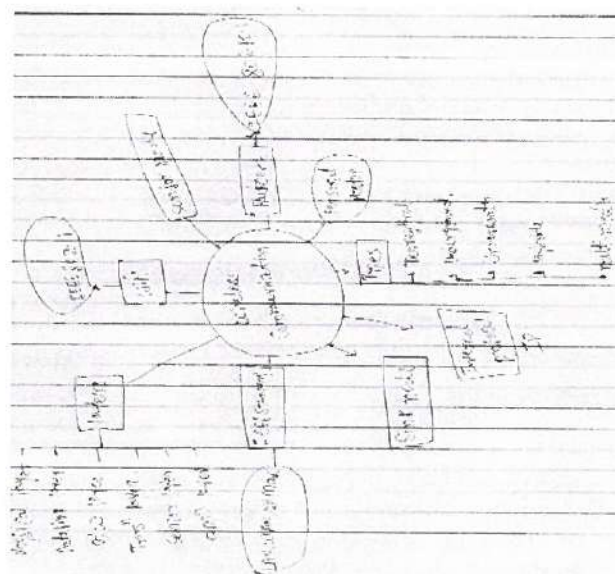


Fig.2. Mind Mapping of wireless Communication2

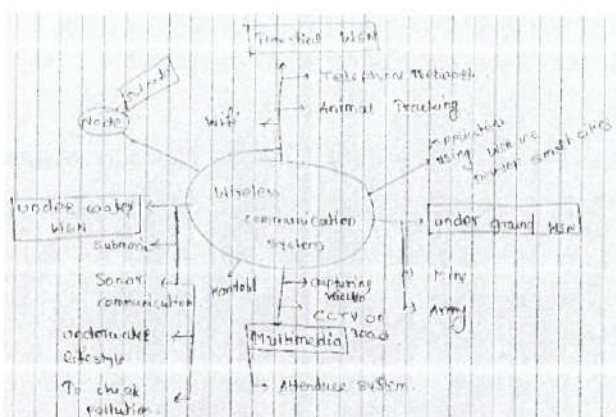


Fig.2. Mind Mapping of wireless Communication system

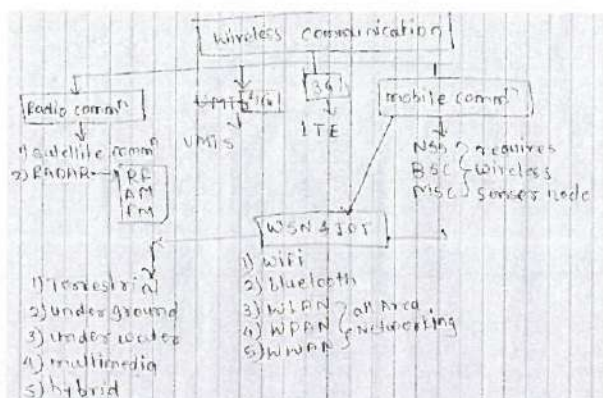


Fig.4.: Mind Mapping of wireless Sensor Networks and IoT

The online mind mapping is also done. The free online mind mapping software's are as following: Bubbles, X Mind 8, Wise Mapping, Mindomo, Free Mind, Idea Flip, Mind Node, Scapple, Mind Manager and Lucid chart. The free hand drawing is used for Mind mapping.

3.2 Types of Mind mapping activities:

Mind Mapping have four types:

Problem Solving Mind Mapping:

Problem solving mind mapping is used solving the industrial problems. This mapping is used in family to solve any problem.

Project Mind Mapping:

Project mind mapping is used to summarize the project and understand the project in simplest way.

Knowledge Mind Mapping:

Knowledge mind is used for evaluation and learning of knowledge in education institutes. The paper used knowledge mind mapping.

Online Mind Mapping:

Online mind mapping is used for online study evaluation and learning.

3.2.1 Advantages of Mind Mapping for Students:

- Students recall and represent the information in a short period.
- Mind mapping develops creativity and summarization skills.
- Supports for developing short notes effectively.

3.2.2 Advantages of Mind Mapping for Faculty:

- Effective evaluation tool to recognize the knowledge of students
- Single page represent the whole topic as well as course learned.
- Help for teachers to change the teaching learning process.

6. Stastical Analysis:

Mind mapping is analysed using stastical tools.

6.1. ANOVA Testing:

ANOVA testing is applied for every unit of mind mapping. One sample unit mapping is given in table 1.

Table1: ANOVA testing for Unit3

Test Result Variables		Sum of Squares	df	Mean Square	F	Sig.
No of words	Between Groups	.139	1	.139	.184	.670
	Within Groups	38.615	51	.757		
	Total	38.755	52			
Application	Between Groups	.786	1	.786	1.103	.299
	Within Groups	36.346	51	.713		
	Total	37.132	52			
Branches	Between Groups	.218	1	.218	.420	.520
	Within Groups	26.462	51	.519		
	Total	26.679	52			
Connection	Between Groups	.407	1	.407	1.048	.311
	Within Groups	19.782	51	.388		
	Total	20.189	52			
Interconnecti on	Between Groups	.103	1	.103	.447	.507
	Within Groups	11.783	51	.231		
	Total	11.887	52			
NEW Things	Between Groups	.490	1	.490	.734	.396
	Within Groups	34.038	51	.667		
	Total	34.528	52			

The all significance value of one-way ANOVA is greater than 0.05. From the table it indicates that there is no significance difference between variable. The mind mapping is used to support students for fast recall and summarization.

6.2. Descriptive Statistics:

Descriptive statistics produces the mean, maximum, minimum and standard deviation of the variables. The mean gives that the students have sufficient information. Standard deviation gives the deviation from the mean means that the deviation of level of students' knowledge gain from assumption or designed variables. 53 students descriptive analysis is represented in table 2.

Table2: Descriptive Analysis

	N	Minimum	Maximum	Mean	Std. Deviation
MM1	53	1.00	5.00	2.7170	.86330
MM2	53	1.00	4.00	2.5472	.84503
MM3	53	2.00	4.00	2.6038	.71628
MM4	53	2.00	4.00	3.3585	.62309
MM5	53	3.00	4.00	3.3396	.47811
MM6	53	1.00	4.00	2.9057	.81487
FMM	53	3.00	4.00	3.5094	.50469
Valid N	53				

6.3. Reliability Statistics:

Reliability analysis gives the for checking the internal ability of activity. Here reliability refers to the confidence of questions asked for students to represent the same value when the measurement is repeated. Cronbach's Alpha is commonly used reliability testing. The ideal value of Cronbach's Alpha is - 0.7. The table 2 represents the value -0.036. This represents that scale is slightly not consistent should be slightly reversible. There is need to use innovations in mind mapping.

Table3: Reliability Analysis

Cronbach's Alpha ^a	Cronbach's Alpha Based on Standardized Items	N of Items
-.036	.038	7

6.4 Kolmogorov-Smirnov Test:

Table4: Kolmogorov-Smirnov Analysis

	MM1	MM2	MM3	MM4	MM5	MM6	FMM
N	53	53	53	53	53	53	53
Normal Parameters	Mean = 2.7170 Std. Deviation = .86330	Mean = 2.547 Std. Deviation = .8450	Mean = 2.603 Std. Deviation = .7162	Mean = 3.3585 Std. Deviation = .62309	Mean = 3.3396 Std. Deviation = .47811	Mean = 2.9057 Std. Deviation = .81487	Mean = 3.509 Std. Deviation = .5046
Most Extreme Differences	Absolute = .250 Positive = .250 Negative = -.176	Absolute = .270 Positive = .270 Negative = -.183	Absolute = .329 Positive = .329 Negative = -.200	Absolute = .284 Positive = .284 Negative = -.282	Absolute = .422 Positive = .422 Negative = -.256	Absolute = .244 Positive = .209 Negative = -.244	Absolute = .344 Positive = .334 Negative = -.344
Kolmogorov-Smirnov Z	1.818	1.963	2.393	2.064	3.070	1.778	2.504
Asymp. Sig. (2-tailed)	.003	.001	.000	.000	.000	.004	.000

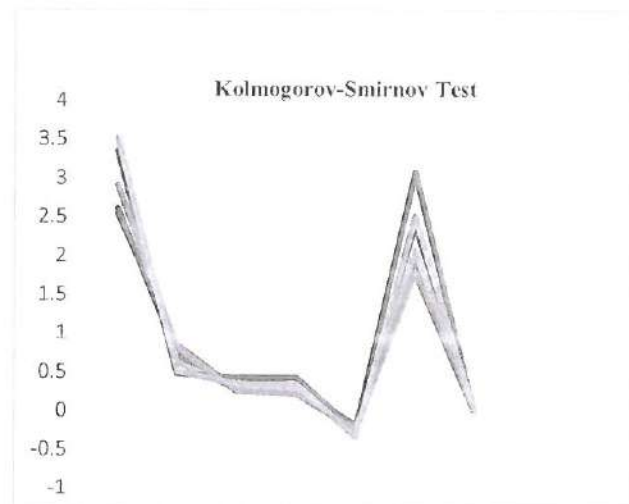


Fig. 5: Kolmogorov-Smirnov representation

Kolmogorov-Smirnov represented in table 4 and fig.5 gives that the analysis of mind mapping to test the mind mapping variables distributed normally or not, both shows that the data is normally distributed means mind mapping variables links all the variables simultaneously.

6.5. Chi-square test:

Chi-Square test is most commonly used statistical tool for analysis. Chi-square test is used for categorical variables. The data calculated in chi-square test is randomly selected from independent variables. This test is sensitive for sample size. The sample size selected for this test are 53. Chi-square test represents the relationship between the used variables for evaluation of mind mapping.

Table 5: Chi-Square test Analysis

	MM1	MM2	MM3	MM4	MM5	MM6	FMM
Chi-Square	34.830 ^a	18.321 ^b	12.491 ^c	16.113 ^c	5.453 ^d	18.321 ^b	.019 ^d
df	4	3	2	2	1	3	1
Asymp. Sig.	.000	.000	.002	.000	.020	.000	.891

Table 5 shows the relationship between the first unit 1 mind mapping to final mind mapping at the end of the course. There exists a relationship in all six units Mind Mapping.

6.7 Inter item correlation matrix:

Inter item correlation mind mapping must show the positive value for positive relation. Table 6 shows the some values negative and some values positive means there should be need to change the teaching learning process for few contents. Individual statistical analysis indicate the weak point, which helps teachers to improve the teaching process. The analysis is the indicator of interconnection s of unit 1 to unit6 knowledge gain by students' evaluation.

Table 6: Inter item correlation matrix Analysis

	MM1	MM2	MM3	MM4	MM5	MM6	FMM
MM1	1.000	-.153	-.185	-.022	-.042	-.066	-.060
MM2	-.153	1.000	-.112	.059	.055	-.063	.145
MM3	-.185	-.112	1.000	.195	.007	.099	.090
MM4	-.022	.059	.195	1.000	-.029	.144	.142
MM5	-.042	.055	.007	-.029	1.000	-.114	-.093
MM6	-.066	-.063	.099	.144	-.114	1.000	.119
FMM	-.060	.145	.090	.142	-.093	.119	1.000

7. Rubrics used for mind mapping Evaluation:

Rubrics are used for evaluation of mind mapping of every student. Table 7 rubrics are used for evaluation of mind mapping.

Table 7: Rubrics for evaluation of mind mapping

Factors	Student Performance Indicators				
	1	2	3	4	5

No. of Words	Poor	Fair	Moderate	Good	Excellent
Branches	Poor	Fair	Moderate	Good	Excellent
Sub Branches	Poor	Fair	Moderate	Good	Excellent
Application	Poor	Fair	Moderate	Good	Excellent
New things	Poor	Fair	Moderate	Good	Excellent
Creativity	Poor	Fair	Moderate	Good	Excellent

8. Results and discussion:

The feedback is collected form students using google form by designing a questionnaire for students.

Table1: Questionnaire for students

Questions	Strongly Agree (5)	Good (4)	Agree (3)	Neutral (2)	Disagree (1)
Could you recall the contents in short time?	[]	[]	[]	[]	[]
Does mind mapping help you to improve your exam performance?	[]	[]	[]	[]	[]
Does this activity support your goal setting?	[]	[]	[]	[]	[]
Can you use this activity for your project?	[]	[]	[]	[]	[]

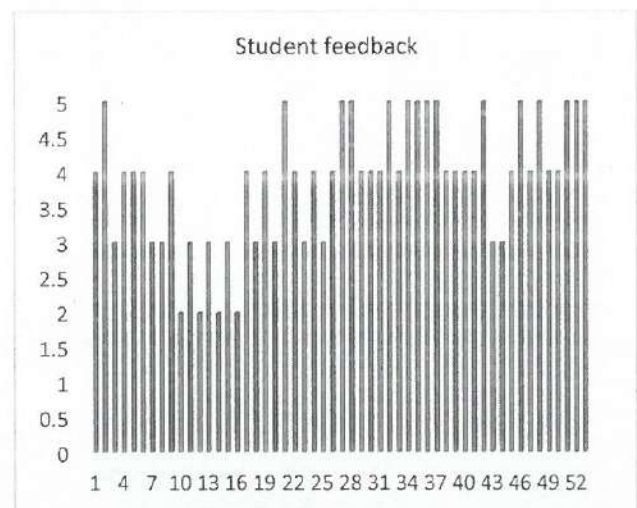


Fig. 6: Kolmogorov-Smirnov representation

Fig. 6 shows that students performance is improved due to mind mapping activity.

9. Conclusion:

Mind Mapping is an effective evaluation tool proved statistically. The question framing should be focusing on

deep learning and bounded to the course. Faculty should take care to design rubrics in a well-framed manner. Hence, Mind mapping helps both course owners as well as the students to gain quickly review of whole course within a very short span of course material.

10. Outcome:

The outcome of the activity is that student attainment is improved. One sample attainment is given in the fig. below.

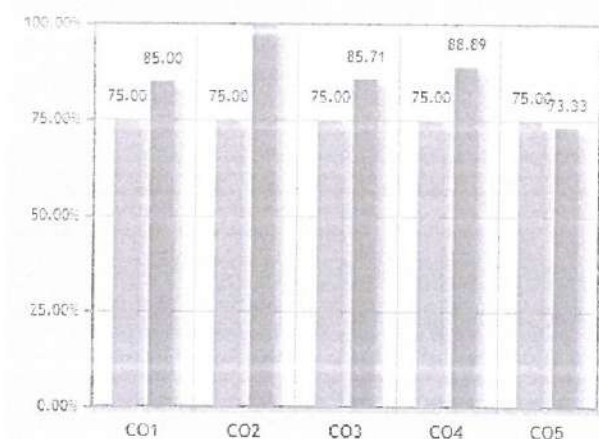


Fig. Student Individual attainment

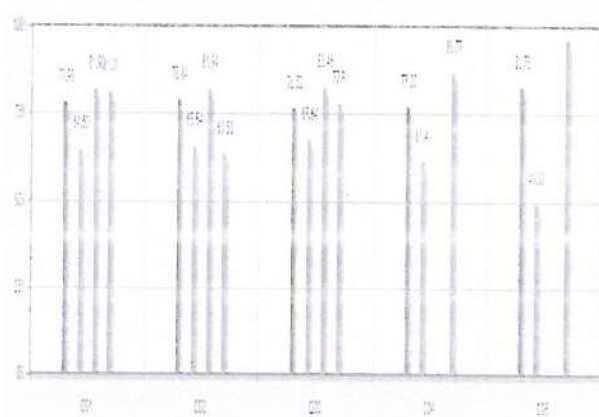


Fig. Student Comparative attainment

The CO attainment are achieved. Individual student performance is increased in the examination.

References:

1. Cui Jingjing, the application of mind mapping in foreign language teaching advances in social science, education and humanities research, 2016, 75, pp160-163.
2. Genevieve Zipp, Catherine Maher, Prevalence of mind mapping as a teaching and learning strategy in physical therapy curricula, Journal of the Scholarship of Teaching and Learning, 2013, 13(5), pp. 21 – 32.
3. Joanne Broggy, George McClelland, Integrating concept mapping into higher education: A case study with physics education students in an Iris University, British education research association, 2009, 1(1), pp.1-13.
4. Kenesha Wilson, Eddia Copeland-Solas, Natalie Guthrie-Dixon, A Preliminary Study on the use of Mind Mapping as a Visual-Learning Strategy in General Education Science classes for Arabic speakers in the United Arab Emirates, Journal of the Scholarship of Teaching and Learning, 2016, 16(1), pp 31-52.
5. Omue Kizilgol, BurcuIs guden Kilic, Hasan Abdioglu, the effects of using the concept mapping and the traditional method on the academic achievement of students in learning the fundamental topics of cost accounting, Journal of business, economics and finance, 2016, 5(2), pp 171-190.
6. Shaimaa Salah Abbas, Ahmed Sharaf Eldin, Adel Elsayed, the effect of concept mapping and mind mapping utilization on students' understanding level: an empirical study, Proc. of the Eighth Int. Conference on Concept Mapping Medellin, Colombia, 2018, 1(1), pp 1-10.
7. Shraddha, Raghvendra, Nikita, Nalini, Ajit, Mind mapping: An useful technique for effective learning in large classroom, Journal of engineering and education transformation, 2015, 28(3), pp.19-24.

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Startup Entrepreneur Support for Design and Development of Problem Statement to Product Finalization: A Case Study

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Abstract: The paper will guide entrepreneurs for idea generation and product finalization for entrepreneurship development. The paper demonstrates the stages of Product Finalization and Idea Generation to consider for the customer segments. A step by step empathy map for design and development of problem statement is described herewith. This concept will facilitate new start-up entrepreneurs for Product Finalization. Case Study method is demonstrated in this paper to finalize the idea of start-up.

Keywords: Product, Idea, Empathy Map, Idea, Start-up.

1. Introduction

Now a days there is a boom of start-ups in the market environment. Many new Start-ups are emerging with innovative ideas. Government of India is enthusiastically supporting for such pioneering initiatives. Government is providing funds and also low interest loans for such new star-ups is made available. Recently new educators are thinking of indulging in such initiative's. For starting any new business, first, every entrepreneur has to have a clear Idea about the business and a skeletal map of his/her Product Plan should be ready. He/she must define the clear problem statement of his idea as well as define a proper business objective. When any entrepreneur is thinking about finalizing the product, he/she is confused regarding the situation as, to consider the benefit of the customer first, or think about the product on priority basis, He/she is also perplexed about other parameters like, Should we think of solution to the problem primarily, or finance should be our main concern or do we worry about the marketing concern. Hence, the entrepreneur is in a dilemma of all such questions as to how to represent the problem statement?

2. Literature review

Neeraj K Pandey[1] conducted a research focused on factors affecting on entrepreneurial ecosystem in the metro cities in India. In this research, a regression model is developed for the financial support for start-ups, which helps to develop the efficiency level of entrepreneurial

ecosystem. In this research, the authors have identified the effect of education, institute, experience, gender and funding type etc. on the initial funding of a start-up.

Juha Saukkonen[2] conducted the research about the road from a student to start-up entrepreneur and an employee. This study focusses on the recognition of developing entrepreneurial skills among the students. The stages identified in this research were Pre-study, Standard Studies, Project work, Active start-up work, Senior Expertise etc. The research has identified three key issues – i) Networking i.e. Developing relationships and getting tasks to perform, ii) Trying i.e. Representing skills and handle real-life business, iii) Learning i.e. developing ability to analyze the solutions or own work and with others. This mind-set can be help to develop entrepreneurial personality.

R. S. Kanchana, J. V. Divya and A. Ansalna Beegom[3] in their paper he author have defined 'Entrepreneur' as a person who has initiative, motivation and skills to setup an enterprise and who always focuses for high achievement. There are lots of challenges faced by the new entrepreneurs e. g. Framing Vision and Business Idea, Funding for Start-up, Developing Team, identifying Right Location, to face competition, Unforeseen Business Challenges, Industrial Changes and Trends, negative mind-set, lack of infrastructural facilities, lack of marketing facilities, etc. So it is necessary to handle these challenges and achieve stability of the enterprise is an important task performed by the entrepreneur.

Darian Unger a & Steven Eppinger[4] in their study says that, product development processes (PDPs) are the process to design new products and bring them to market. There are certain difficulties faced by the entrepreneur in selecting, designing & developing new product. The researcher says that, only having the good idea for the new product is not enough, to successfully bring this product to the market, and develop right product development process require to become succeed in the market.

Boyoung Kim, Hyojin Kim and Youngok Jeon[5] The researcher suggests that idea commercialization, goal-orientation, entrepreneurs' competence is important success factor for design startups. This study focuses on determination of the key success factors of a design startup business. The courage to start a business is also important factor. The means of startups design need multifaceted points, which must include vision, goal and step-by-step mission in line with achieve sustainable growth. Start-ups having high risk of failure in comparison with existing businesses. The main reason behind risk of failure is limited availability of resources, lack of established channels with vendors and customers.

3. Problem identified:

- Specific target ordinance is not identified.
- Problem is not defined properly.
- Size of market is not defined correctly.
- Problem identified and solution on that is not focused.

Due to failure in designing a correct problem statement or lack of proper technique of product finalized, many start-ups have not survived the fierce competition of the market. For efficient and effective survival of start-ups appropriate product must be finalized.

4. Objectives:

- To support the design and development of problem statement.
- To deliberate the insights of customer needs and requirements.
- To support the design and development of product finalization.

5. Research Methodology:

Faculty members from various departments were chosen for the study. The course chosen for the study was Entrepreneurship Development (ED) track, floated to the semester VIII of the B.Tech engineering program. Questions were framed to undertake the study based on the course content. For evaluating the parameters of idea generation and product finalization, a feedback was taken from students enrolled for Entrepreneurship Development ED track (start-up). This was further analysed and the results gained were presented graphically and hence, the outcome's were described.

6. Design and Development of Problem Statement:

Figure below represents the flow of problem statement finalization starting from customer as a priority and also product as a major concern.

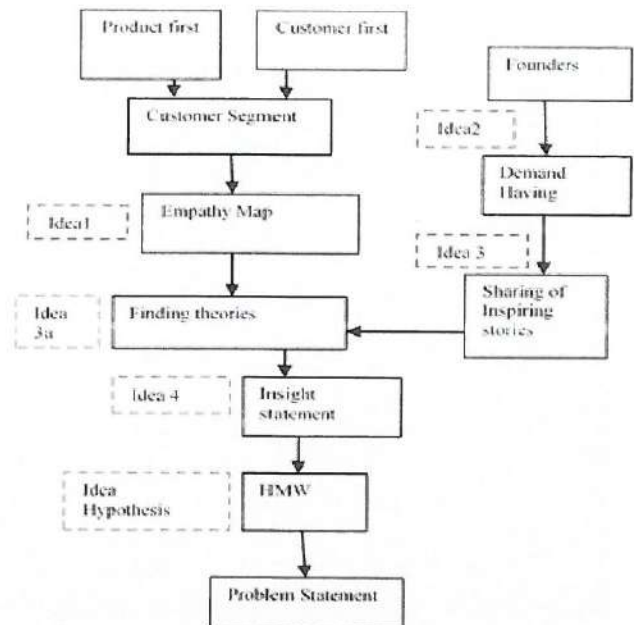


Fig.1 Overall block diagram of problem statement

The diagram represents the consideration of product and customer as a priority concern for customer segment. Customer segment is nothing but the target customer group selection based upon area and choice of the product. Identification of customer's for the product is done in customer segment. e.g. For purchase of Smart phone, the target customer base is majority young generations pertaining to their product needs. In this situation the schedule of the user is recorded and observed carefully. For example; To understand the routine schedule of a working women, the entire one-day time scheduling of the working women is given below: The schedule of the user is recorded and observed carefully.

Table1: Entire one day schedule of a working women:

Time schedule	Activity
5.00 a.m. to 5.50 a.m.	Wake-up time
5.30 a.m. to 6.00 a.m.	Getting Fresh
6.00 a.m. to 6.15 a.m.	Tea and worship
6.15 a.m. to 6.45 a.m.	Cleaning the rooms, porch, drawing Rangoli
6.15 a.m. to 7.30 a.m.	Preparation and serving the breakfast, Arranging for washing machine
7.30 a.m. to 8.15 a.m.	Preparation of food
8.15 a.m. to 8.45 a.m.	Cleaning the utensils and pots, hanging clothes for drying
8.45 a.m. to 9.00 a.m.	Ready for office, packing Tiffin
9.00 a.m. to 10.00 a.m.	Travelling to office
10.00 a.m. to 6.00 p.m.	Office working hours
6.00 p.m. to 7.00 p.m.	Travelling back home
7.00 p.m. to 7.15 p.m.	Getting Fresh and having tea
7.15 p.m. to 8.45 p.m.	Preparation for dinner, serving food.
8.45 p.m. to 9.30 p.m.	Cleaning utensils, pots and dishes, guiding children
9.30 p.m. to 10.00 p.m.	Preparation for second day
10.00 p.m. to 11.00 p.m.	Discussion with children and making bed ready for sleeping.

Shown in fig. below is the Entire One day schedule of a male customer.

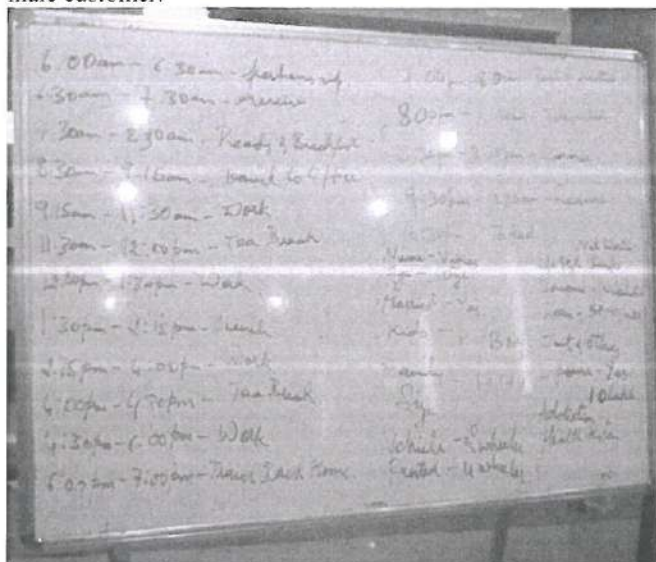


Fig 2. Entire One day Schedule of a male customer.

7. Empathy Map:

Empathy Map provides detail information regarding user. In traditional methods empathy map is divided into four parts where the user is a primary concern and hence, is depicted in the centre of the diagram. Rest of the four parts of the Empathy map diagram are Says, Thinks, Does and Feels of user or customer.

The traditional empathy map is described as below.

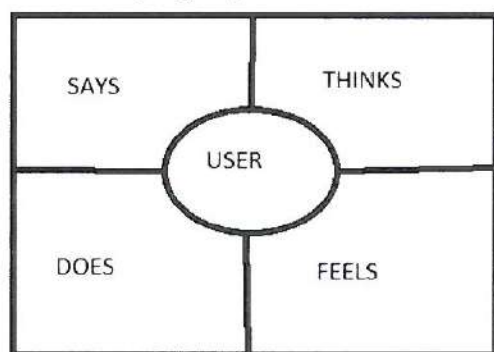


Fig.3 Traditional empathy map

The 'Says' parameter includes what normally the user or the customer says while thinking about purchasing a product. Such as:

I want something different.

I want this, I want that

The cost of the product should be low.

The device must be portable, handy and lifelong.

I want something durable, etc.

'Think' parameter contains discusses about, what the users are thinking throughout about their experience towards the product. To understand this segment a qualitative research

should be undertaken by the entrepreneur. To understand **Thinks** parameter, a questionnaire design should be in such a manner that the developer should be able to find out what users are thinking before making a buying decision or what they will think after the usage of the product.

Example: "I am afraid of to use this kind of instrument"

"I don't want to use this product!"

"This product is not suitable for me."

"This product is not affordable, We won't be able to pay the amount", etc.

'Feels' parameter includes what the user of the product feels towards the product. Is he/she satisfied or unsatisfied regarding the usage of the product. It is very difficult to distinguish between the two parameters 'Think' and 'Feels'.

Example: If a user feels satisfied to use any product or want to buy that product, but due to price he/she is unable to buy that product. In this case we can say that, user feels happy to buy that product, so **Feel** parameter is defined and due to high price of the product, they are unable to buy that product. In this case the **Thinks** parameter of user is taken into consideration.

Example: Amruta likes the brand of BMW car's but cannot purchase the BMW car due to its affordability. In this case **Feel** parameter is addressed in like's the brand, but the **Think** parameter is not addressed, as she is unable to purchase due to high price of the car.

Does is a very important parameter in the empathy map. For this the developer must have some previous back records of purchases of customers or users. This parameter will help to analyze what normally the user is buying, where they are investing their money, how they are utilizing their earnings, resources, what is the frequency of purchase etc.

Example: Maruti or Honda car dealers mostly contact all the Professors in colleges, doctors, officers in different government organizations and non-government organizations. Because as per their records, the purchasing of cars is done mostly from such people who are in these jobs. This parameter helps to fix marketing strategy and target such customer base.

There is a difference in one user empathy map to multiuser empathy map. To understand the difference in one user empathy map and multiuser empathy map developer must use qualitative analysis. For quantitative analysis the developer must set the target customer, which will help for sample size calculation. Sample size will be calculated by online sample size calculator
e.g. www.surveysystem.com
www.surveymonkey.com
www.calculator.net/sample-size-calculator.html
www.raosoft.com/samplesize.html
www.quatricks.com/blog/calculating-sample-size

www.npscalculator.com/de/significance

Now-a-days due to evolution in the research and development and analysis the traditional empathy map was modified. The new empathy map is demonstrated as below.

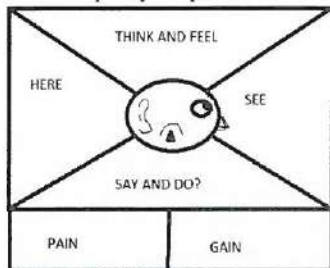


Fig.4 modified empathy map.

By considering the working women as a customer, the empathy map is given as below.

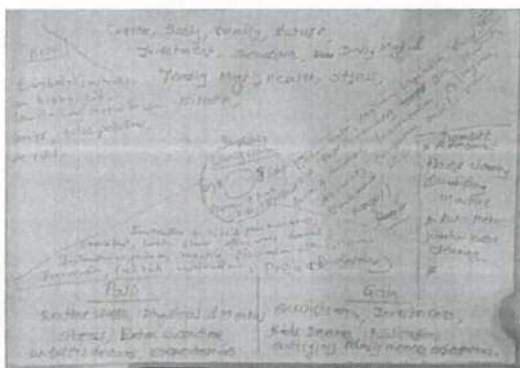


Fig. 5 Empathy map of working women

The different ideas for customer segment are listed in figure below. The group members generated different ideas through brainstorming. The ideas are pasted on card sheets.

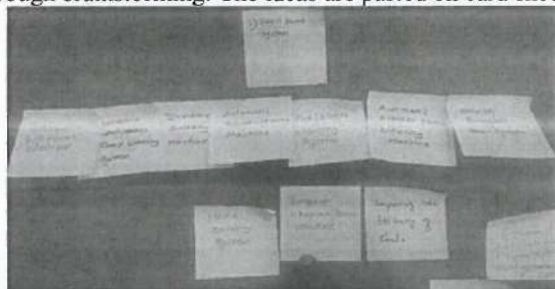


Fig.6. List of ideas.

Once the list of ideas are collected, then grouping of similar type of ideas is done.

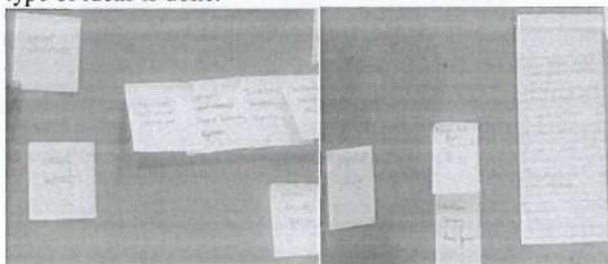


Fig.7. Grouping the similar types of ideas.

After grouping the similar types of idea, repeated idea's are cancelled whereby the filtering of best ideas can be done.

8. Rubrics for selecting the Idea:

Rubrics is designed to select the idea. The rubrics is as given below.

Table 2: Rubrics for selecting the idea

Criteria	Idea (1=Low, 2=Mod. 3=Good, 4=excellent)					Final Score
	Idea 1	Idea2	Idea3	Idea4	Idea5	
Fits in customer segment	[]	[]	[]	[]	[]	
Evaluation of Empathy map	[]	[]	[]	[]	[]	
Problem and solution is identified.	[]	[]	[]	[]	[]	
Target market analysis	[]	[]	[]	[]	[]	
Different / better / new product	[]	[]	[]	[]	[]	
Cost, benefit and passion factor analyzed.	[]	[]	[]	[]	[]	
Suitable to my skills or skilled persons are available	[]	[]	[]	[]	[]	

Based on final score of idea the product is finalized. Once the product is finalized, then the product design is selected. Initially multiple ways are tested for design finalization.

9. Idea Hypothesis:

Idea Hypothesis is scientific and educated prediction way to test the selected idea. Idea hypothesis supports for Idea validation which reduces the risk of idea failure.

Steps for idea hypothesis are as follows:

- State Idea Hypothesis
- Formulate an analysis plan
- Choose data collection method
- Analyze sample data
- Interpret results
- Discuss on Idea.

10. Problem Statement:

In problem statement the pain and gain of customer must be stated effectively and innovatively. It is very easy to define the problem statement using following statement.

Customer needs a way to **Need** because **Innovative Insights**.

11. Product design steps:

Any product design contains the following steps:

- List the objectives of product
- Brainstorm the product among team
- Brainstorm the solution
- Develop prototypes and solution with objectives
- Discuss on solution

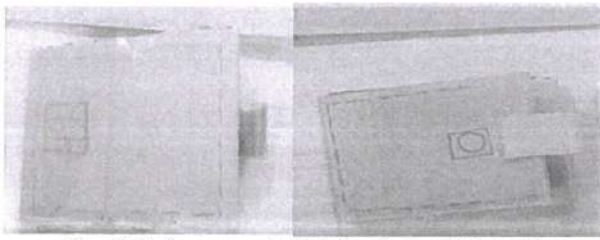


Fig. 8 Design presented at the time of discussion

Fig. 8 represents the design finalized at the time of discussion which fulfils all the requirements of men customer's.

The next step after this is to develop a prototype and take the initial testing of products. Next step is to analyse the product and design. If required, certain modification's can be done at this early stage. The key features of products are listed below:

- Flexible product design
- Adoptable technology, continuous improvement
- Critical evaluation
- Customer feedback evaluation

12.Data Collection:

The data for this study is collected by the faculty members, Entrepreneurship Development ED track students, and start-up entrepreneur's. For data collection questionnaire method is used. The questionnaire is given in table. 3 below.

Table 3: Questionnaire

Questions	Strongly Agree (5)	Moderately Agree(4)	Agree (3)	Neutral (2)	Disagree (1)
Case study support for idea generation and selection	[]	[]	[]	[]	[]
Case study support for product design and development	[]	[]	[]	[]	[]
Case study support for finalize the product	[]	[]	[]	[]	[]
Will you recommend this case study to your friends	[]	[]	[]	[]	[]
Need more details for start-up.	[]	[]	[]	[]	[]

13. Results and discussion:

The study was evaluated using faculty as well as students' feedback. For the study feedback is evaluated graphically.

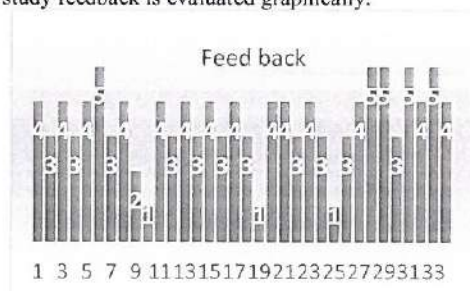


Fig. 9. Feedback analysis

Fig. 9 shows that the case study is a very beneficial and useful method for start-ups. It also indicates that more details

are required for designing a start-up. This requirement was given by three members.

14.Conclusion:

Entrepreneurship is an effective development tool for the journey from idea generation to product finalization. This paper framed has focused on the deep support given to the Entrepreneurship Development ED course. Faculty took care that few ideas were generated and developed and conclude to product finalization in a well-framed manner. Hence, Entrepreneurship development helps both course owners as well as the students to gain quickly a review of idea within a very short span of course material and finalize the product in a well-framed manner.

15.Outcomes:

The outcome of this students' activity was that students introduced their start up. Students were very much enthusiastic about the whole concept and they did take interests regarding the finalization of start-up project. Students agreed upon unanimously and accepted the fact that they would prefer to be job creator's instead of job finder's.

References:

1. Neeraj K. Pandey (2018) An Analysis of Startup Ecosystem in Metropolitan City in India, International Journal of Engineering and Management Research, Volume-8, Issue-2, 237-244.
2. Juha Saukkonen (2017) From a Student of Startup Business to a Startup Employee or Entrepreneur: Study on Career Narratives of Students in Entrepreneurial Programs in a University, Journal of Educational Issues, Vol. 3, No. 1, 214-235.
3. R. S. Kanchana, J. V. Divya and A. Ansalna Beegom (2013) Challenges faced by new entrepreneurs, International Journal of Current Research & Academic Review, Vol. 1, No. 3, 71-78.
4. Darian Unger a & Steven Eppinger (2011) Improving product development process design: a method for managing information flows, risks, and iterations, Journal of Engineering Design, Vol. 22, No. 10, 689-699.
5. Boyoung Kim , Hyojin Kim and Youngok Jeon (2018), Case Report Critical Success Factors of a Design Start-up Business, Sustainability Journal, 2-15,

Acknowledgement

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Investment Decision Using Technical Analysis

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Abstract:

The prediction of stock prices is a challenging task. Use of certain tool and techniques for analyzing the market trend can help the investor to take proper decision concern with investment.

Technical analysis is a study approach to estimate the trend of prices through the analysis of historical market information. With the support of technical analysis, traders and investors can foresee the right time to enter and exit a trade, thus allowing worthy returns. The psychology of the crowd market can be identified by using the patterns. It is used for forecasting prices, which helps investors make informed investment decisions. Technical analysis is an analysis done by placing stock information such as prices, volumes and open interest in a chart. By the application of different patterns and indicators one can evaluate the future movements of prices. With the help of technical analysis, it is possible to predict stock prices to some extent. The stock moves according to some patterns, one can predict stock prices by identifying those prices. The main objective of this paper is to analyze the performance of selected stocks of IT companies through Technical Analysis which will help investors to take decision concern with investment in it by monitoring the trend in growth and performance based on past data.

Introduction:

Nowadays people are showing interest to invest in stock market particularly in equity stocks which will give them good returns with tax saving benefits. For Giant business organizations equity stocks are significant and playing a major role in its contribution of capital. As the Indian economy is growing, large numbers of investors are considering investment in share market as one of the investment avenue.

The price of a share is the price at which buying and selling of the share takes place with mutual understanding of the parties i.e. the buyer and seller. The expectations of the investor from the buying and selling of the share drives the pricing of the shares in the market. If he expects the bullish behavior from price of security, he will purchase it, whereas if the investor expects the bearish behavior then, he will sell the security. The expectations of the people are neither easily quantifiable nor predictable. Thus, the prediction of stock prices becomes a challenging task. Therefore there is need to use certain tool and techniques for analyzing the market trend which will help the investor to take proper decision concern with investment.

Technical analysis is a study approach to estimate the trend of prices through the analysis of historical market information mainly related to the price and volume traded of a particular stock, commodity etc.(Dourra & Siy, 2002). It supports buying and selling decisions using market statistics. It mainly includes the study of charts that show the trading history and the statistics of any security that is being analyzed. With the support of technical analysis, traders and investors can foresee the right time to enter and exit a trade, thus allowing worthy returns.



The psychology of the crowd market can be identified by using the patterns. It is used for forecasting prices, which helps investors make informed investment decisions.

Literature review:

Several Studies were conducted by the researchers on Technical analysis. A few of them are given below:

Mitra (2010) discussed that the most technical trading rules are able to capture the direction of market movements well and give great positive returns in long and short positions. But these revenues cannot be fully utilized because of real transaction costs in the world. Trading rules based on short-term moving averages may be able to detect trends in the financial chain very quickly, but these rules also generate a large number of transactions that cause higher transaction costs.

Almujamed, Fifield and Power (2013) finds that Kuwait investors act like their counterparts in other developed and emerging stock markets. Fundamental analysis is considered the most important valuation method among research participants, while technical and risk analyzes are second and third respectively.

Boobalan (2014) explains that one can predict the ideal investment solution on the stock market on the basis of technical analysis knowledge. Using technical indicators, the future market of the securities has been known in which to invest. For more precise forecast of stock prices of individual companies, investors conduct a fundamental analysis of stock prices, they can predict the future trend of stock price.

Stanković, Marković and Stojanović (2015) examines the efficacy of technical analysis and predictive modeling in defining the optimal strategy for investing in the stocks indices of emerging markets. By Comparing the results obtained from traditional statistical methods for predicting the trend of financial series and proposed LS-SVM model, concluded that machine learning techniques capture the non-linear models which are dominant in the financial markets in more adequate way. Outperforming the results of Buy & Hold strategy and technical trading strategies, application of LS-SVM in decision making process on investing on the financial market significantly can contribute to maximization of profitability on investment.

Objectives:

The main objective of paper is

- To analyze the performance of selected stocks of INFOSYS, WIPRO and TCS through Technical Analysis that is monitoring the trend in growth and performance based on past data.
- To interpret the analysis, which will help to take decision concern with investment in it.

Scope: The study is limited to the technical analysis to predict the future behavior of the selected stocks. The selected companies are: INFOSYS, WIPRO, TCS- Tata Consultancy Services. Three years (April- 2015 to March- 18) data has been taken into consideration for the study.

Methodology:

As the study is based on the existing facts and figures and price movements of the selected stocks of the companies. For achieving the objectives of the study the research design used is descriptive and analytical in nature.

Secondary data has been used for performing Technical Analysis. The data concern with the weekly movements of the stock price of the selected companies in NSE was collected of last 3

years, that is, from April 1, 2015 to March 28, 2018. Various tools applied to analyze future movement of prices by taking the Closing prices of the shares. Also the data was collected from the stock market trading in NSE, several books, magazines and websites.

Technical Analysis:

Technical analysis is nothing but forecasting future prices on the basis of an examination of past price movements. It is based on the analysis of the current information concern with demand and supply position of the stocks, commodities or any financial instrument. Technical analysis is an analysis done by placing stock information such as prices, volumes and open interest in a chart. By the application of different patterns and indicators one can evaluate the future movements of prices.

Tools used in Technical Analysis:

- Moving Averages

Most graphic patterns show a big difference in price movement. This can make it difficult for traders to get an idea of the general trend of a security. A simple method that traders use to combat this is to apply moving averages. A moving average is the average price of a guarantee during a given period of time. It is especially useful in volatile markets.

The two most popular types of moving averages are:

1. **Simple Moving Average (SMA)**-A simple moving average is calculated by computation of the average (mean) price of a security over a specified number of periods. For example: a 10 – day moving average is calculated by adding the closing prices for the last 10 days and dividing the total by 10.
2. **Exponential Moving Average (EMA)** -Exponential moving average is the moving average that is formed by applying weight to the recent price changes.

The exponential moving average (EMA) gives a higher weighting to recent prices than the simple moving average (SMA) does, while the SMA assigns equal weighting to all values. The two averages are similar because they are interpreted in the same manner and are both commonly used by technical traders to smooth out price fluctuations.

Types of charts:

Open-high-low-close chart - Normally this type of chart get used to demonstrate movements in the price of a financial instrument over a given period of time. Vertical lines on the chart shows the price range (the highest and lowest prices) over one unit of time, e.g., one day or one hour.

Candlestick chart – Candlestick charts form the basis of the oldest form of technical analysis. Candlestick charts provide the information as an open price. High price, low price and closing price, however. Candlestick charts provide a visual indication of market psychology, market sentiment and possible weakness, which makes it a fairly valuable trade tool. Candlesticks expand and fill the gap between the opening and closing prices to emphasize the opening / closing ratio.

Line chart – It is joins the closing price values with line segments.

There are different types of trends in Technical Analysis charts:

- **Resistance** – It is a price level that may act as a ceiling above price



- Support – It is a price level that may act as a floor below price

Trends can be classified into three types:

1. Uptrend In Technical Analysis Chart:

The stock is considered to be in an uptrend, When a particular stock is making higher high and higher low. Highest highs indicate that the stock is making consecutive peaks than previous highs. The highest lows indicate that the fund is higher than the previous lows.

When the stock is in an uptrend, it is advisable to buy. The optimism is that stock can go up even more. The upward trend can last from a few weeks or even a few years. The line that is connecting highest above and below is called the trend line. The higher high trend line is called the resistance line and the higher low trend line is called the support line.

2. Downtrend In Technical Analysis Chart:

When the stock is making lower highs and lows lower, it is considered to be in a bearish trend. Lower highs mean that the previous peak is higher than the current peak. Lower lows mean that the current bottom is lower than the previous one.

When the stock is in a bearish trend, it is advisable to sell on bounces as there is pessimism that the stock could fall further.

3. Sideways Trend in Technical Analysis Chart:

When the stock trades in a range, it is called sideways trend. Sideways trend occurs when the force of demand & supply are nearly equal. A sideways trend is also called horizontal trend.

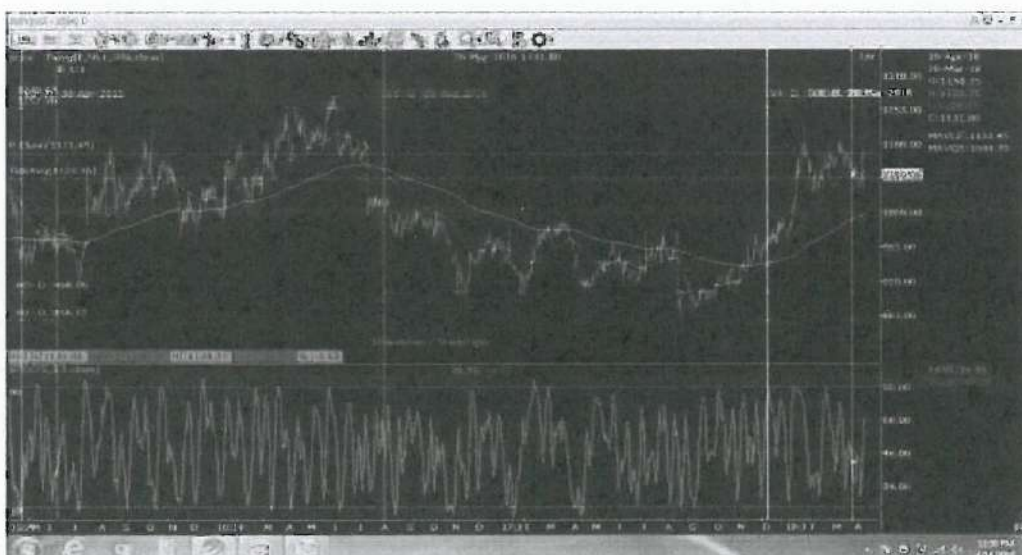
Technical analysis of Selected IT Companies:

INFOSYS:

Infosys Limited (formerly Infosys Technologies Limited) is an Indian multinational corporation that provides business consulting, information technology and outsourcing services. It is based in Bengaluru, Karnataka, India.

In terms of revenue, Infosys is the second largest Indian IT Company in 2017 and 596th largest public company in the world. On April 19, 2018, its market capitalization was \$ 37.32 billion. The credit rating of the company is A - (Standard & Poor's rating)

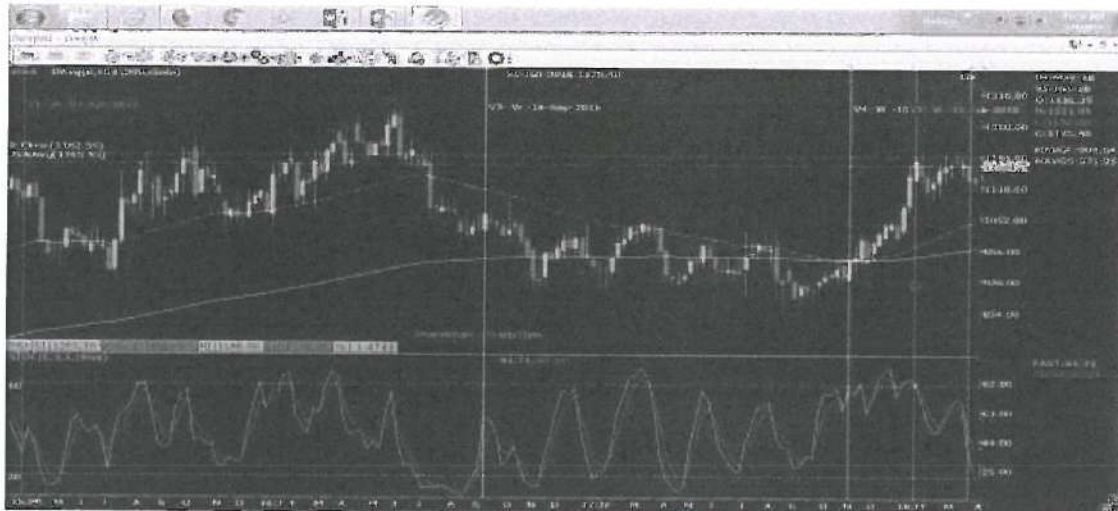
Daily Chart



Interpretation:

- From the above chart it can be seen that, 5th Aug, 2016 INFOSYS Stock started falling down at 1068. Hence the selling movements were started.
- The rates on 15th Nov 2016 are 923.55, then the stock become range-bound.
- Then next buying movement started on 8th Dec. 2017, when the rate was around 1001.85 and it raised up to high 1221 on 24th Jan 2018.
- After that the stock came down up to 1097.75 and again it became range-bound

Weekly Chart



Interpretation:

- From the weekly chart of Infosys it can be observed that, from 16th Sep 2016 to 10th Nov. 2016 the stock of Infosys was sideways.
- From 11th Nov. 2016 white moving average line crossed the yellow line which indicated a buy signal.
- On 11th Nov. the rates were at around 943.
- The movement carried up to 25th Jan 2018, at that week the high was 1221.
- After that the chart became sideways again.
- So here, moving average lines gives a perfect buy call.

Comparison- NIFTYIT and INFOSYS (Daily Chart)

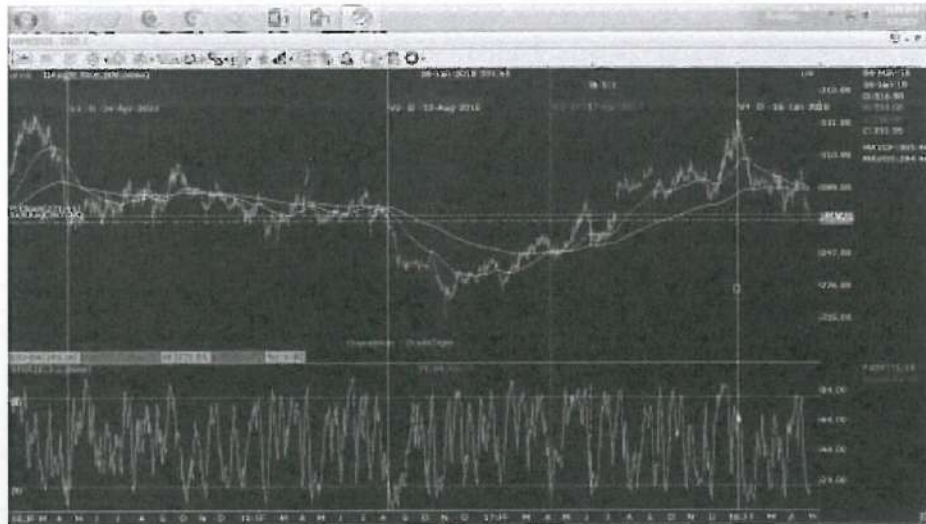


Interpretation:

- When compared INFOSYS with NIFTYIT, INFOSYS shows the upside and downside movement as same as NIFTYIT which reflects in the slide above.
- This is because it is one of the major stock in Nifty IT.

WIPRO: Wipro Limited (Western India Palm Refined Oils Limited) Western India Products Limited is an Indian IT Services corporation headquartered in Bengaluru, India.

Wipro- Daily Chart



Interpretation:

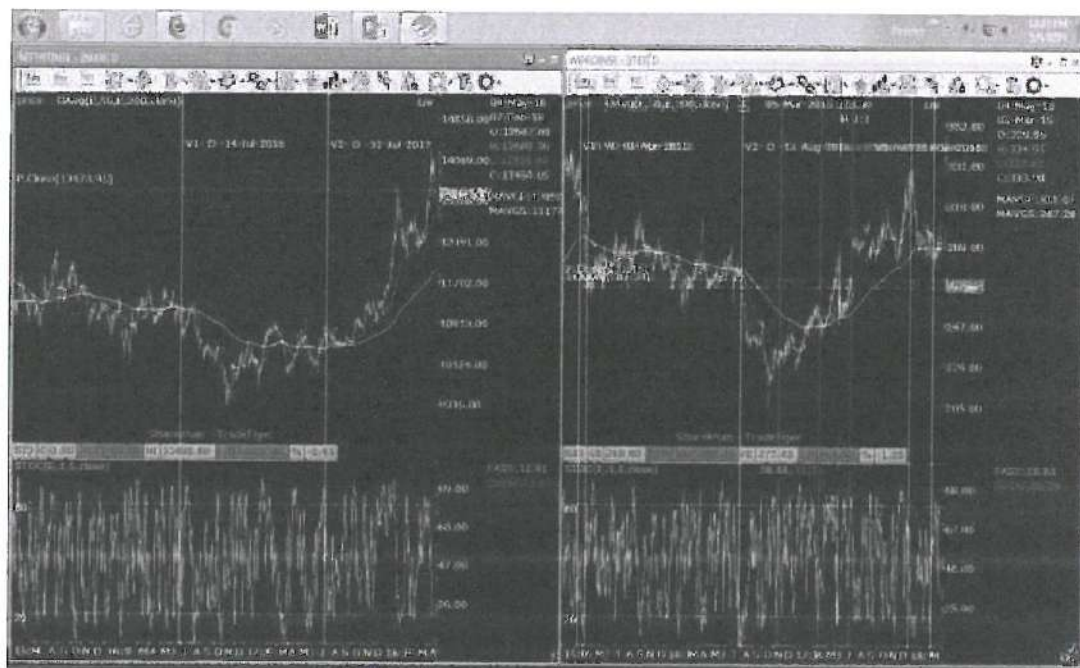
- From the chart April 2015 to March 2018, it can be seen that, from 24th April 2015 to 29th July 2016 the stock is in the range-bound position.
- From 30th July 2016 the stock fall down and the actual selling movement started and continued till Nov. 2016.
- The white line crosses the Yellow line on 17th April 2017 and then the rates increased and stock started moving up which indicates the buy signal.
- Then actual next buying movement started on 18th April 2017, when the rate was around 245.50 and it raised up to 331.95 on 16th Jan. 2018.

WIPRO- Weekly Chart



Interpretation:

- From 24th April 2015 to 19th Aug 2016 the stock of WIPRO is in range-bound position and from Oct 2015 to July 2016 the stock became range-bound.
- The actual selling started on 19th Aug 2016 but moving average indicator indicated to sell on 9th Dec 2016, on other hand on 21st July 2017 the white line crossed yellow line and went up which gives a buy indicator and raised up to 334.
- The white moving average line crossed the yellow line and went down on 9th Dec 2016, which indicated the sell signal at current price 229.05
- Again on 21st July 2017 white line crossed the yellow line and goes up which indicated the buy signal at current price 286.05
- The stock is in the growth and the high was 334 on 19th Jan 2018.
- Then stock became range-bound from Feb 2018.

Comparison- NIFTYIT and WIPRO**Interpretation:**

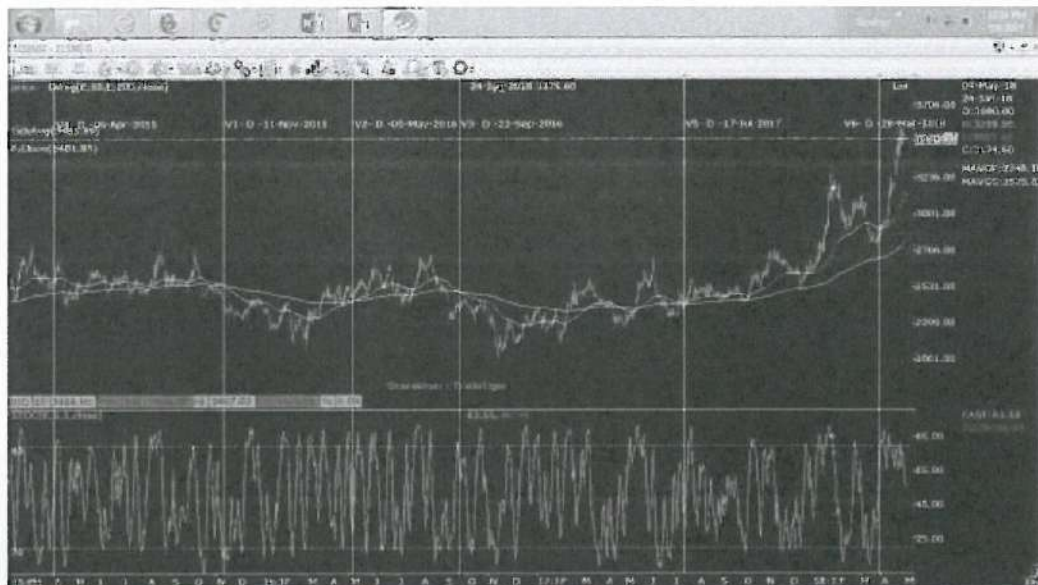
- Wipro Stock chart shows the upside and downside movement as same as NIFTYIT which reflects in slide above.
- This is because it is one of the major stocks in Nifty IT.

TCS: Tata Consultancy Services Limited (TCS) is an Indian multinational company providing information technology (IT) services, consulting and business solutions.

TCS is one of the largest Indian companies by market capitalization. TCS is now among the most valuable IT service brands in the world. Only TCS generates 70% of the dividends of its parent company, Tata Sons. In 2015, TCS ranks 64th overall in the ranking of the most innovative companies in the world of Forbes, which makes it the highest ranked IT services company and the top Indian company. It is the ninth largest IT service provider in the world by revenue. As of 2017, it ranks 10th on the Fortune India 500 list. In April 2018, TCS became the

first Indian IT company to break the \$ 100 billion market capitalization, and the second Indian company even after its m-cap stood at Rs. 6,79,332.81 crore (\$ 102.6 billion) on the Bombay Stock Exchange.

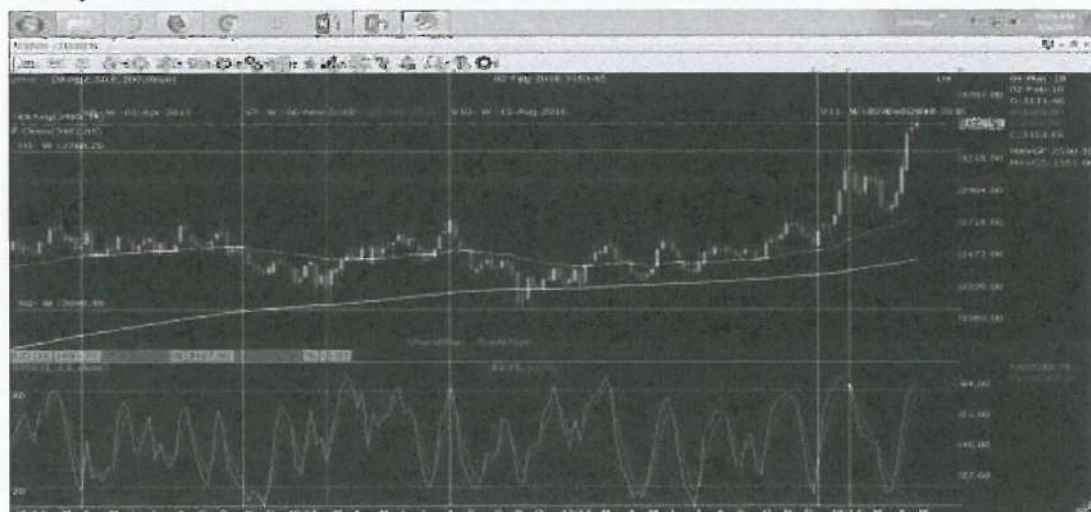
TCS- Daily Chart



Interpretation:

- From the Daily chart of TCS stock shows the range-bound position from 6th April 2015 to 11th Nov. 2015
- On 11th Nov 2015 the white moving average line crossed the yellow line and went down, which indicate the sell signal.
- Again on 5th May 2016 white line crossed yellow line and goes up, which indicate buy signal.
- The sell position is continued from 22nd Sept. 2016, as the stock was falling down again and it shows the sell signal.
- Then from 17th July 2017 the stock goes up and the high was 3259.05 on 24th Jan 2018

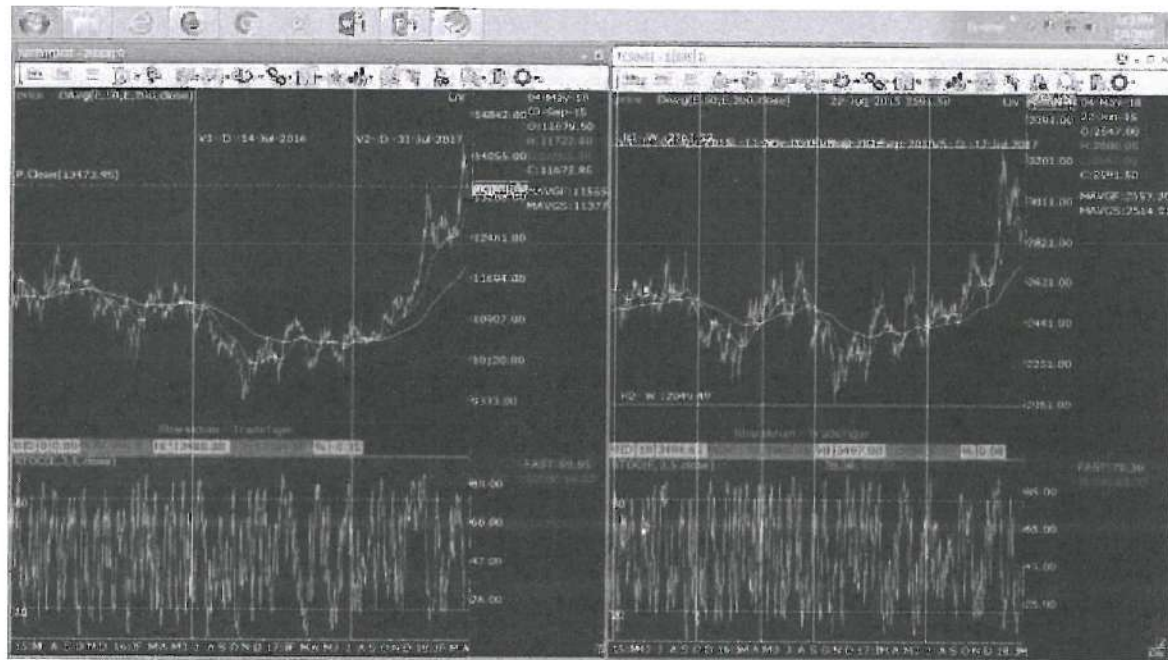
TCS-Weekly Chart



Interpretation:

- The above weekly chart of TCS Stock depict that, the stock is mostly in sideways position and range-bound position.
- No effectively buying and selling signals views are there.
- From 1st April 2015 to 6th Nov 2015 the stock is in sideways at around 2500
- And, from 13th Nov 2015 TCS Stock started falling down from the current price 2397.40 as shown in the slide. And the buying movement is started.
- On, 26th Feb 2016 the stock moves up at current price 2210.50
- Then buying movement started on 23rd March 2016, when the rate was around 2473.80 and it raised up to 2738.45 on 12th Aug 2016.
- Again the stock started falling down and it is in sideways position.
- The actual next buying movement is started on 22nd Dec 2017 when the rate was around 2646.75 and it raised up to 3153.65 on 2nd Feb 2018.

Comparison- NIFTYIT and TCS



Interpretation:

- TCS Stock chart shows the upside and downside movement as same as NIFTYIT which reflects in slide above.
- This is because it is one of the major stocks in Nifty IT.

Conclusion:

Although some principles and rules of technical analysis are universally applicable, one should remember that technical analysis is more a form of art than a science. As an art form, it is the interpretation of the analysis which matters more.

However, it is also flexible in its approach and each investor should use only what suits their style. The prices of the shares of the companies are very sensitive and can change very quickly (up and down), with the help of technical analysis, it is possible to predict stock prices to some



extent. The stock moves according to some patterns, one can predict stock prices by identifying those prices.

References:

1. Dourra, H., & Siy, P. (2002). Investment using technical analysis and fuzzy logic. *Fuzzy Sets and Systems*, 127(2), 221–240. [https://doi.org/10.1016/S0165-0114\(01\)00169-5](https://doi.org/10.1016/S0165-0114(01)00169-5)
2. Subrata Kumar Mitra (2011) How rewarding is technical analysis in the Indian stock market?, *Quantitative Finance*, 11:2, 287-297, DOI: 10.1080/14697680903493581
3. Hesham I. Almujaed, Suzanne Fifield, David Power, (2013) "An investigation of the role of technical analysis in Kuwait", *Qualitative Research in Financial Markets*, Vol. 5 Issue: 1, pp.43-64, <https://doi.org/10.1108/17554171311308959>
4. C. Boobalan *International Journal of Business and Administration Research Review*, Vol.2, Issue.4, Jan-March, 2014, pp.26-36.
5. Jelena Stanković, Ivana Marković, Miloš Stojanović (2015) 'Investment Strategy Optimization Using Technical Analysis and Predictive Modeling in Emerging Markets', *Procedia Economics and Finance*, Volume 19, pp. 51-62, [https://doi.org/10.1016/S2212-5671\(15\)00007-6](https://doi.org/10.1016/S2212-5671(15)00007-6)
6. Hemal Pandya, 'Technical Analysis for Selected Companies of Indian IT Sector', *International Journal of Advanced Research* (2013), Volume 1, Issue 4, 430-446
7. https://zerodha.com/z-connect/wp-content/uploads/2014/06/TA_wrkbk.pdf
8. Sudheer V., 'Trading Through Technical Analysis: An Empirical Study From Indian Stock Market', *International Journal of Development Research*, Vol. 5, Issue, 08, pp. 5410-5416, August, 2015.



Bandhan Bank : A Growth Trajectory

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"Bandhan is about togetherness, we work for inclusive growth" Mr. Chandra Shekhar Ghosh

Abstract:

Over the past few decades, Microfinance sector has grown rapidly. In 1976, Muhammad Yunus, established Grameen Bank, Bangladesh which was considered as the foundation of the modern MFIs. Micro finance is a channel, which provides fund to the community or group who do not have approach to banking services. Today, this micro finance business has progressed into a vibrant industry. Micro-credit, by definition, means short-term loans that are advanced to poorer sections of the society for the purpose of self-employment or any activity plan, which help them to earn income and take care of their families. This paper focus on the growth journey of Bandhan Financial Services. From past 18 years, BFSL is funding for small business entrepreneurs and women borrowers. Though there were many up and downs in the micro finance industry, this organization succeeded in getting a banking license from the Reserve Bank of India in 2014. It is the first bank to be set up in eastern part of India after Independence. The bank is set up to cater to the needs of the unorganized sector such as daily wage earners and women running small business.

Background:

At the age of 58, Mr. Chandra Shekhar Ghosh, a son of a sweet-meat vendor founded Bandhan Financial Services in 2001. The time when most established banks were wary about lending to small borrowers without credit history. Many such people had to turn to moneylenders who, in turn, wouldn't lend without collateral, or charged exorbitant rates of interest. With a corpus of just Rs. 2 lakh, most of it coming from a relative and the rest from a private lender, he established Bandhan in 2001, reaching out to women entrepreneurs. (Anand, 2018)

This micro finance institution is involved in providing loans to small customers, those who have no or less way in to official banking services. Thus, it has earned trustworthiness and many great compliments for their contribution for the development of the community who are unnoticed by the formal banking system (Jagtap, 2017).

What is Micro finance?

Micro finance is a channel, which provides fund to the community or group who do not have approach to banking services. Micro-credit, by definition, means short-term loans that are advanced to poorer sections of the society for the purpose of self-employment or any activity plan, which help them to earn income and take care of their families.

Over the past few decades, Microfinance sector has grown rapidly. In 1976, Muhammad Yunus, established Grameen Bank, Bangladesh which was considered as the foundation of the modern MFIs. This bank established with the objective of providing financial facilities to the needy and weaker sections of the society. This bank focuses more on women to help them increase their standard of living, earn profit and become financially strong and independent. According to



Yunus, poor people are like 'human bonsai'. They deprived because society had not accepted their existence and left without the real social and economic support to develop. Grameen Bank took effort to shift the neglected community to the main stream of the society. For the pioneering work on micro-finance, Nobel Prize awarded jointly to Mr. Mohammad Yunus and Grameen Bank in the year 2006.

Today, this micro finance business has progressed into a vibrant industry. By providing short-term loans to promising entrepreneurs, this sector helped them to establish new businesses. When talking about giving refinance facility to MFIs significant role has played by the Non-Banking Financial Companies, Regional Rural Banks, Commercial Banks, Co-operative societies etc.

Microfinance sector has become imperative sector. It initially started with micro investments, micro saving then it was engaged in micro credit. Now they transformed into micro enterprises. This continuous progression has created a chance to the rural people to develop and achieve reasonable monetary, societal and educational empowerment. Thus, it has helped them in moving toward improved standard of living and quality of their life.

Brief profile:

Bandhan was set up in 2001 to address the dual objective of poverty alleviation and women empowerment. The microfinance activities are carried on by Bandhan Financial Services Pvt. Ltd. (BFSPL), incorporated under the Companies Act, 1956 and also registered as a Non-Banking Financial Company (NBFC) with the Reserve Bank of India (RBI). The microfinance operations started from Bagnan, a small village which is 60 km away from the city of Kolkata. Now it has its headquarter at Kolkata; it is the first bank to be set up in eastern part of India after Independence. Bandhan bank's two-third branches and three fourth of its loans are in West Bengal, Assam and Bihar.

The main thrust of Bandhan is to work with women who are socially disadvantaged and economically exploited. Bandhan works for their social upliftment and economic emancipation. To achieve the above objective, Bandhan is basically engaged in the delivery of microfinance services to the poor women.

Dr. Ashok Lahiri is the Chairman of Bandhan Bank and Chandra Shekhar Ghosh is acting as the managing director and chief executive officer of the bank.

Besides its founder, Chandra Shekhar Ghosh, Singapore Sovereign Wealth Fund GIC, World Bank's International Finance Corporation (IFC), North Eastern Financial Inclusion Trust, Bandhan Employees Welfare Trust and Small Industries Development Bank of India (SIDBI) are the main investors of the bank.

Transformation into Bank:

In 2009, Bandhan was registered as a non-banking financial company providing select banking services. Thereafter i.e. in 2011 started a tough time for the micro finance industry because of growing news of suicides by borrowers.

The Story of Bharat Financial In Founder Vikram Akula's Words

The microfinance company was founded by Vikram Akula in 1997. Akula pushed a for-profit microfinance model in India, arguing that this is the only way to attract talent and investors

to lending to the bottom of the pyramid. In August 2010, SKS Microfinance became India's first listed microfinance company.

But SKS had a bumpy journey ahead.

In late 2010, a crisis broke out in the microfinance sector in Andhra Pradesh, where SKS' operations were concentrated. The crisis followed an ordinance by the state government which restricted micro lending in the state and clamped down on loan recovery practices. Microfinance firms in Andhra Pradesh, including SKS Microfinance, were crippled. The industry settled after regulation of the microfinance industry was taken up the Reserve Bank of India.

The crisis for SKS, however, did not end there. In November 2011, founder Akula was forced out of the company following a high-stakes battle between the management and the board regarding future strategy. After Akula's exit, the company and its new management tried to de-risk the company's balance sheet. It also applied for a licence to convert itself into a small finance bank which was later denied.

Excerpts from article published by Vishwanath Nair, Published on: Sep 11 2017, 4:52 PM "An exclusive email interview with Bloomberg Quint, Akula commented on the initial idea behind the business, its pitfalls and its prospects."

Though there were many up and downs in the micro finance industry, Bandhan had a gross loan portfolio of about Rs 5,700 crore as of March 2014 however it functions in under-banked regions of India (Atmadip Ray , M Rajshekhar, 2014). In April 2014, the Reserve Bank of India (RBI) selected Bandhan and IDFC for setting up a universal bank from the 25 aspirant such as Aditya Birla Nuvo, Bajaj Finserv, LIC Housing Finance Ltd, L&T Finance Holdings, Reliance Capital, Religare Enterprises and Shriram Capital etc. Then Bandhan Bank Limited was incorporated on 23rd December 2014 as a wholly-owned subsidiary of Bandhan Financial Holdings Limited. In June 2015, the banking regulator gave its final permission. (*Bandhan Bank*, n.d.) Bandhan Financial Holdings is owned by Bandhan Financial Services Limited (BFSL), the largest micro finance organization in India.

As per the RBI licensing norm, capital limit to start a new bank is Rs. 500 crore. But the Bandhan Bank started with a capital base of Rs. 2,570 crore. As on 31 March, 2015,

The Bandhan bank has thus started with 501 branches and 50 ATMs on day one. The total staff strength of the bank is around 19,500. The bank had made net profit of Rs. 275 crore during eight months period i.e. August 2015 to March 2016.

Bandhan Bank expects to propose its outstanding banking products and services to all different sectors of the society. Though it is a bank for all, yet they want to continue their focus on providing funds to meet the financial requirements of community who are ignored by the formal banking system. Also they expect to extend their services by focusing more on generating better education, wellbeing and self-employment opportunities to the poorer sections of the society. The management of the Bandhan bank now desires to expand the loan portfolio by increasing lending funds to retail business and Micro and Small Medium Enterprises.

Employee fraud: SKS Microfinance staff embezzle Rs 15.8 crore

SKS Microfinance has said that some of its employees have cheated the company to the tune of Rs 15.8 crore in the last financial year. The services of employees involved have been terminated and the company has written off over Rs 14 crore.



The auditors of the company have reported that there was cash embezzlement by the employees to the tune of 2.5 crore and loans given to non-existent borrowers was Rs 13.3 crore, the micro lender said in its annual report.

"We have been informed that during the year there were instances of cash embezzlements by the employees of the company aggregating Rs 2,50,91,317; and loans given to non-existent borrowers on the basis of fictitious documentation created by the employees of the company aggregating Rs 13,33,13,975," auditors S R Batliboi & Co said in the annual report.

"The services of all such employees involved have been terminated and the company is in the process of taking legal action. The outstanding balance (net of recovery) aggregating Rs 14,24,40,656 has been written off," the auditors added.

SKS said that employee fraud is an inherent risk in the business the company operates in, since all the transactions are cash-based. In case of cash embezzlements, the company has recovered an amount of Rs 1,08,59,714 including the insurance cover.

Cash embezzlement is 0.09 per cent of disbursement during the year, SKS clarified. According to the annual report, total disbursements in the 2011-12 stood at Rs 2,736 crore.

Excerpts from article published in The Economic Times on "Employee fraud: SKS Microfinance staff embezzle Rs 15.8 crore", PTI, Updated: Jul 25, 2012,

Journey of Progress:

Since then, its network has expanded from 501 branches and 50 ATMs to 840 branches and 383 ATMs across the country as of September 2017. With a customer base of 11 million, it has managed to expand its loan book to Rs. 20,800 crore and has also mobilized Rs. 23,500 crore in deposits. Till September 2017, about 90% of the bank's business was still made up of the small loans extended to small entrepreneurs.

Unlike other players in the microfinance industry, Bandhan Bank joined the league of big banks only in August 2015. In less than three years, it has emerged as a leader and is set for India's biggest banking initial public offering (IPO), at a time when its older and bigger peers are in duress. With the due permission of market regulator Securities Exchange Board of India (SEBI), Bandhan Bank prepared Draft Red Herring Prospectus for an Initial Public Offer (IPO) in the year 2018. According to the draft papers, Bandhan Bank's IPO comprises fresh issue of up to 9,76,63,910 equity shares and an offer for sale of up to 1,40,50,780 scrips by International Finance Corporation (IFC) and up to 75,65,804 shares by IFC FIG Investment Company.

The initial public offering (IPO) of Bandhan Bank got subscribed by 14.62 times on the third and final day of the bidding process. The IPO received bids for 1,22,10,47,920 shares as against the total issue size of 8,34,96,347, data showed. The QIB quota saw 38.68 times subscription, while the NII (Non-Institutional Investors) category was subscribed 13.89 times. RII (Retail Institutional Investors) saw 1.19 times subscriptions.

How Chandra Shekhar Ghosh of Bandhan Bank rose from poverty to riches

It was poverty that made Chandra Shekhar Ghosh rich. CEO and managing director of Bandhan Bank, Ghosh learnt from poverty important lessons of his life and framed his worldview, while it also gave him a business idea that grew into a legend.



The man who spent a good part of his life interacting with extremely poor people in rural areas of Bangladesh and eastern India has been feted by the markets now. Kolkata-based private lender Bandhan Bank on Tuesday made a dream market debut. The scrip got listed at Rs 499 on the NSE, a 33 per cent premium to the issue price of Rs 375. The Rs 4,473 crore IPO was subscribed 14.62 times.

As of December 31, 2017, the bank had 887 branches and 430 ATMs, together serving over 2.13 million general banking customers in east and northeast India.

Excerpt from article published in The Economics Times on “From bicycle to a Land Rover: How Chandra Shekhar Ghosh of Bandhan Bank rose from poverty to riches”

Conclusion:

Micro finance institutions are basically established with the objective of providing financial facilities to the needy and weaker sections of the society. They helped the government to get rid of poverty and achieve economic development of the country.

The banking sector gives the impression to get a new competitor and a boost in the economy in India. After 11 years, India has got a new private bank – Bandhan Bank. The bank is a full-blown commercial bank that came into being recently. Bandhan is also the first microfinance company in India that has been transformed into a bank. It got a banking license from the Reserve Bank of India in 2014. The bank is set up to cater to the needs of the unorganized sector such as daily wage earners and women running small business. The bank focuses on Eastern India as banking penetration is still poor in the region but at the same time want to expand their loan portfolio by increasing lending funds to retail business and Micro and Small Medium Enterprises. In future, it expects to offer saving, insurance and remittance services to the needy people of the society.

References:

1. Anand, N. (2018). The story behind India's biggest banking IPO began with rural women. Retrieved from Quartz India website: <https://qz.com/india/1223219/bandhan-bank-from-rural-women-to-indias-biggest-banking-ipo/>
2. Atmadip Ray , M Rajshekhar. (2014). Bandhan gets a bank licence: Can it survive as a bank & yet be true to its original spirit? *The Times of India*. Retrieved from <https://economictimes.indiatimes.com/industry/banking/finance/banking/bandhan-gets-a-bank-licence-can-it-survive-as-a-bank-yet-be-true-to-its-original-spirit/articleshow/33757517.cms?intenttarget=no>
3. Bandhan Bank. (n.d.). Retrieved from <https://www.bandhanbank.com/about-bandhan-bank.aspx#1>
4. Jagtap, M. (2017). TRANSFORMATION FROM MICRO FINANCING UNIT TO BANK: CASE STUDY OF BANDHAN, KOLKATA. *International Journal of Advanced Research (IJAR)*, 5(2), 1148–1150. Retrieved from <https://www.scribd.com/document/341256183/TRANSFORMATION-FROM-MICRO-FINANCING-UNIT-TO-BANK-CASE-STUDY-OF-BANDHAN-KOLKATA>

Enhancing Academic Performances of Women Undergraduates in Engineering Through Cultural Interventions

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Abstract

This paper aims to find the impact of a program named 'Shardanyas' (meaning charitable organization of the goddess of knowledge) consisting of technical and non-technical events and special soft skill development programs on the performance of women pursuing technical programs. The paper opted for an exploratory study using both closed ended and open-ended approach consisting of 251 women students participating. In-depth interviews were conducted for 15 top performing students. The academic and extra-curricular performance of students were measured every six months after implementing the program. The data was complemented by the feedbacks received from recruiting agencies also. The initial analysis shows statistically significant improvement over two years, in performance of female students, unlike male students, validating efficacy of the interventions. The program catalyzed acquisition of skills such as communication and public speaking skills, and leadership and management skills, as well as improvement in semester grade points of women students, which can augur well for the students' professional excellence. The experiment was carried out at an institution and needs to repeat at multiple institutions to validate the findings. The work presented can help fellow educators to develop appropriate co-curricular programs that can pave the way to professional success of women students. Technical colleges and professions have been globally facing gender disparity. Researchers have identified the major reasons for the disparity in colleges as "leaky pipeline" and "chilly climate." The study fulfils this identified need to improve the performance of women technical graduates.

Keywords: Gender Disparity, Technical Education, Women undergraduates.

Article Type: Case Study

Introduction

Globally, engineering profession has been facing the lack of gender diversity due to factors such as a leaky pipeline, chilly climate, inflexible timing, societal pressure, and glass ceiling (Friedman, 2015, Fouad et al., 2017). Hewlett et al. found that most of the women engineers cite feelings of isolation, extreme timings in work schedules, unsupportive work environment, and biased rules about advancement and success as major factors in their decision to leave engineering careers [3]. Xie et al. opine that married women in STEM careers were at a disadvantage as compared to married men with respect to tenure and promotion decisions [4].

Hawks and Spade [5] examined the gender differences with respect to prospective career progression by administering a survey to 249 freshmen students at a US university, of whom 42 were female. They found that a role conflict rather than abilities and attitude better accounted for the disparity in the progression in careers of men and women engineers. They also found that women are more likely to believe that, the need to balance parenting and career after having children and their lack of confidence in their ability to succeed are key barriers for their progression and due to these perceived barriers women engineers do not see themselves in supervisory positions and earning money at par with their male counterparts.

Data from the National Science Foundation has shown that presently just 12.9% of all US engineers are women. The Royal Academy of Engineering's (RAE) Diversity Program reports the female engineering workforce during 2011-16 in UK to be a mere 8% [6]. Nagpal reports the number in the Indian tech industry to be 26% [7], but is still far lower than the halfway mark and thins rapidly as the seniority level rises. Thus, the percentage of females in the engineering workforce appears to be unsatisfactory all over the world.

This is not desirable from the industry perspective. Various studies such as a Harvard study [8] indicate that "at every level, more women were rated by their

peers, their bosses, their direct reports, and their other associates as better overall leaders than their male counterparts — and the higher the level, the wider that gap grows.” Richard Boocock affirms that women’s voices are essential to problem-solving and innovation, which is at the heart of engineering. He, therefore, argues for more opportunities for women engineers to thrive at workplaces [9]. Wilma Kelly says that the world needs more women in engineering and asserts that until we have a secure pipeline of female engineering talent to tap into for the future, nobody in the business can rest on their laurels [10]. The World Economic Forum (WEF) reports that all industries face difficulties in recruiting women for technical and engineering roles [11], and the engineering segment remains a traditional male-dominated segment with weak signs, if any, of changes.

Program design

While employers have been undertaking many activities such as establishing women-friendly programs and policies to improve gender workforce diversity, academic organizations cannot be mute spectators. In that context, a rural Indian engineering college initiated a program called as ‘Shardanyas’ (meaning charitable organization of the goddess of knowledge) to develop professional skills among female students, which can lay a foundation for them to become strong and successful professionals.

The two-week ‘Shardanyas’ program consisted of technical events such as debates, extempore speeches, and quizzes on technical topics; and business plan competitions for developing technical and analytical skills. The program also had non-technical / cultural events such as floral decoration, ‘rangoli’ (an art form, originating in the Indian subcontinent, in which patterns are created on the floor in living rooms or courtyards using materials such as colored rice, dry flour, colored sand or flower petals), drawing, face painting, cooking for enhancing their creativity, intellectual curiosity, and openness to new experiences. Many studies show that participation in extracurricular activities improves academic and overall performance of students. Having formal structures such as professional clubs and SWE (Society for Women Engineers) can go a long way in providing contextual support to women students as found by many researchers [12], thereby helping them develop social capital [13]. Ro and Knight (Ro and Knight 2016) claim that women students, who

participated in non-engineering clubs or activities reported greater improvement than men students in fundamental skills, contextual competence, and communication skills. Josphe claims that such extra-curricular activities not only emphasize academic enhancement but are also a source of emotional and social enrichment [14]. Hattie [15] and Camp [16] found a significant effect on academic achievement of students participating in extracurricular activities. Many extra-curricular activities include physical movements that regulate the level of cortisol produced in the body, which increases brain functions. Physical programs, thus, can have a positive effect on academic achievements as they facilitate the learning process [17] [18]. Waychal et al. [19] have demonstrated that extra-curricular and co-curricular activities help engineering students attain professional excellence.

The program was completely led and managed by female students, with mentoring support provided by female faculty members. Wang and Shiveley [20] have demonstrated that students playing leadership positions tend to perform better in their academic programs. Industrial Engineering at Oklahoma University suggest that women faculty members’ visibility in different departmental activities helps attract and retain women students [21, 22].

The event concluded with a cultural evening comprising of competitions in performing arts such as solo and group dancing and singing performances. A female role model was invited as chief guest for the concluding activity. Felder et al. [23], Johnson and Sheppard [24], and Raelin et al. [25] emphasize importance of providing women role models to women engineering students.

Overall, the program was designed to develop strong and confident female engineers, thus laying a foundation for improving gender diversity. The program objective was also to develop skills such as critical and creative thinking, communication, teamwork, time management, and leadership and organizational skills, which are important for working engineers. In short, the program provided varied opportunities and life learning experiences to female students and made them ready for attaining professional excellence.

College

The program was run at a rural engineering college, where the female student ratio is at par with the national ratio of around 30%. The college runs undergraduate programs in computers, information technology, electronics and telecommunication, mechanical, civil, electrical, and automobile engineering. The college is one of the best in the region and figured in India's top 100 list in 2016. The female students, owing to their rural culture, tend to have many social restrictions, which hamper their development. In that context, the program aimed at creating opportunities for their social, affective, and cognitive developments.

Result : We tested the program success by conducting student surveys on their experiences about the program and comparing changes in academic performances of male and female students over the year.

Student surveys

We used a five-point Likert scale (1= Strongly Agree and 5 = Strongly Disagree) to measure experiences of students, who participated in the program. We circulated the Google form to randomly chosen 374 students, 251 of whom responded. We present the descriptive statistics of the responses in table 1. Most of the responses are concentrated around "agree" indicating that the program has benefitted most of the students. It appears that the most significant benefit of the program was tackling stage fear, and the least significant benefit was confidently interacting with male students. The program events gave opportunities of public speaking for many women, which seems to have helped in overcoming stage fear. Since the program participants had limited opportunities for interacting with male students, they did not see much improvement in that area.

	N		Arithmetic Mean	Standard Deviation
	Valid	Missing		
My general confidence level is improved	251	0	1.522	0.8732
The program has helped me tackle stage fear	249	2	1.349	0.7031

I can face placement interviews more confidently	249	2	1.787	2.0058
My leadership and management skills are enhanced	247	4	2.012	0.8948
I feel peer pressure reduced while performing	250	1	1.512	0.8837
My conversation skills have improved	247	4	1.628	0.8874
The program has helped in facing male counterparts more confidently	251	0	2.056	2.0369

Table 1: Descriptive statistics of the survey results
Academic Performance

We present changes in academic performance (grade point average), from the year 2018 to 2019, of all men and women students in figure 1 and 2. We ran two-sample t-tests using Minitab 18. We can see the performance of women students showing statistical significant improvement (p-value 0.000), unlike that of men students (p-value 0.079).

Figure 1: Comparison of academic performance (CGPA) of men students in year 2018 (14 M) and 2019 (15 M).

son of academic performance (CGPA) of women students in year 201

Two-Sample T-Test and CI: 14 F, 15 F

Method
 μ_1 : mean of 14 F
 μ_2 : mean of 15 F
 Difference: $\mu_1 - \mu_2$
 Equal variances are not assumed for this analysis.

Descriptive Statistics				
Sample	N	Mean	StDev	SE Mean
14 F	824	7.221	0.827	0.029
15 F	557	7.289	0.766	0.031

Estimation for Difference

Difference	
95% CI for Difference	(-0.1628, -0.3454, -0.0782)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$	
Alternative hypothesis	$H_1: \mu_1 - \mu_2 \neq 0$	
T-Value	DF	P-Value
-2.65	1205	0.000

The students were given various targets like completion and submission of assignments, Presentations and project submissions. The performance of male and female students were evaluated on the parameters of time of submission and accuracy. It was observed female students performed better.

Figure 3 : Recommended targets achieved by male and female students

Two-Sample T-Test and CI: 14 M, 15 M

Method
 μ_1 : mean of 14 M
 μ_2 : mean of 15 M
 Difference: $\mu_1 - \mu_2$
 Equal variances are not assumed for this analysis.

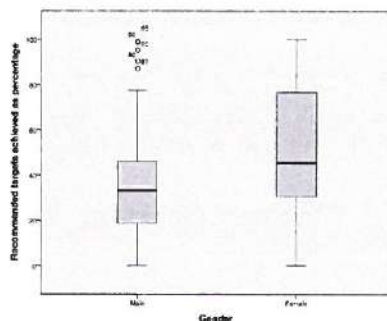
Descriptive Statistics				
Sample	N	Mean	StDev	SE Mean
14 M	1393	7.269	0.905	0.024
15 M	1408	7.349	0.901	0.024

Estimation for Difference

Difference	
95% CI for Difference	(-0.0800, -0.1269, 0.0069)

Test

Null hypothesis	$H_0: \mu_1 - \mu_2 = 0$	
Alternative hypothesis	$H_A: \mu_1 - \mu_2 \neq 0$	
T-value	DF	P-Value
-1.76	2798	0.078



Interview results:

The girl students enjoyed working during the shordanyas activities. They pursued their individual passions. They were involved in decision making and

took leadership in all activities. The students said that this brings a sense of ownership and empowerment in them. The students working in one particular activity were from diverse backgrounds (Engineering year , branch , category and culture) , they worked together and engaged in dialogues. This made them understand each other better and developed their interpersonal skills. They said that we made sure that" everyone's ideas are heard and also helped each other in weaker areas. These activities made them more confident and that confidence got reflected in their academic performances also.

Conclusions

The engineering profession is in a dire need of innovation, which requires diverse workforce [26]. The profession, unfortunately, has poor diversity with respect to gender and ethnic minorities. Academic fraternity, therefore, must recruit adequate number of diverse students and develop them so that they can succeed in their professions. Waychal et al. [19] have proven that extra-curricular activities and academic performance can help students to excel in their professions. Based on that, a rural Indian college ran a two-week all-women program that helped women students develop various skills and improve their academic performance. The program catalyzed acquisition of skills such as communication and public speaking skills, and leadership and management skills, as well as improvement in semester grade points of women students, which can augur well for the students' professional excellence.

The experiment was carried out at an institution and needs to repeat at multiple institutions to validate the findings. Further, the experiment did not study the actual professional performance, which requires to be done, to provide concrete evidence of efficacy of such a program. The two-week program had many elements and we can inspect the impact of individual elements on students' experience of the program and their improvement in different skills and academic performance. However, the work presented can help fellow educators to develop appropriate co-curricular programs that can pave the way to professional success of women students.

References

1. Friedman, S., *Still a "stalled revolution"?* Work/family experiences, hegemonic masculinity, and

- moving toward gender equality. *Sociology Compass*, 2015. 9(2): p. 140-155.
2. Fouad, N.A., et al., *Women's Reasons for Leaving the Engineering Field*. *Frontiers in psychology*, 2017. 8: p. 875.
3. Hewlett, S.A., et al., *The Athena factor: Reversing the brain drain in science, engineering, and technology*. *Harvard Business Review Research Report*, 2008. 10094: p. 1-100.
4. Xie, Y., K.A. Shauman, and K.A. Shauman, *Women in science: Career processes and outcomes*. Vol. 26. 2003: Harvard University Press Cambridge, MA.
5. Hawks, B.K. and J.Z. Spade, *Women and men engineering students: Anticipation of family and work roles*. *Journal of Engineering Education*, 1998. 87(3): p. 249-256.
6. Randsad. *Diversity in engineering in 2017*. 2017 [cited 2018]; Available from: https://www.randstad.com/workforce-insights/workforce360/archives/diversity-in-engineering-in-2017_157/.
7. Nagpal, M. *Women in tech: There are 3 times more male engineers to females*. 2017; Available from: <https://community.nasscom.in/community/discuss/dn i/blog/2017/09/08/women-in-tech-there-are-3-times-more-male-engineers-to-females>.
8. Zenger, J. and J. Folkman, *A study in leadership: Women do it better than men*. Orem, Utah: Zenger Folkman Inc, 2012.
9. Collis, A., *The case for change: why engineering needs more women*, in *The Guardian*. 2013.
10. Matthews, V., *Why we need more female engineers*, in *The telegraph*. 2017.
11. WEF, W.E.f. *The Industry Gender Gap - Women and Work in the Fourth Industrial Revolution*. 2016; Available from: http://www3.weforum.org/docs/WEF_FOJ_Executive_Summary_GenderGap.pdf.
13. Martin, J.P., D.R. Simmons, and S.L. Yu, *The role of social capital in the experiences of Hispanic women engineering majors*. *Journal of Engineering Education*, 2013. 102(2): p. 227-243.
14. Joseph, N.A., *Exploring the relationship between extracurricular participation & probability of employment for high school graduates*. 2009: Georgetown University.
15. Hattie, J., *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. 2008: Routledge.
16. Camp, W.G., *Participation in student activities and achievement: A covariance structural analysis*. *The Journal of Educational Research*, 1990. 83(5): p. 272-278.
17. Hall, E.M., *Integration: Helping to get our kids moving and learning*. *Physical educator*, 2007. 64(3): p. 123.
18. Lynott, F.J., *Integrating other subject matter without jeopardizing physical education goals: The content linkage approach*. *Strategies*, 2008. 22(1): p. 10-17.
19. Waychal, P., J. Patil, and P. Deore, *Determinants of Professional Excellence of Engineering Graduates – An Empirical Study*. 2015, ASEE Conferences: Seattle, Washington.
20. Wang, J. and J. Shiveley, *The impact of extracurricular activity on student academic performance*. Retrieved May, 2009. 5: p. 2010.
21. Murphy, T.J., et al., *Achieving parity of the sexes at the undergraduate level: A study of success*. *Journal of Engineering Education*, 2007. 96(3): p. 241-252.
22. Walden, S.E. and C. Foor, "What's to keep you from dropping out?" *Student Immigration into and within Engineering*. *Journal of Engineering Education*, 2008. 97(2): p. 191-205.
23. Felder, R.M., et al., *A longitudinal study of engineering student performance and retention. III. Gender differences in student performance and attitudes*. *Journal of Engineering Education*, 1995. 84(2): p. 151-163.
24. Johnson, M.J. and S.D. Sheppard, *Relationships between engineering student and faculty demographics and stakeholders working to affect change*. *Journal of Engineering Education*, 2004. 93(2): p. 139.
25. Raelin, J.A., et al., *The gendered effect of cooperative education, contextual support, and self-efficacy on undergraduate retention*. *Journal of Engineering Education*, 2014. 103(4): p. 599-624.
26. Hansen, M.T. and J. Birkinshaw, *The innovation value chain*. *Harvard business review*, 2007. 85(6): p. 121.

6. A Study of Production of Fish and Fish Seeds in Aquaculture

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Introduction to the Study

“A Study of Production of Fish and Fish Seeds in Aquaculture” is the title of proposed research. Production Processes and Control have the crucial role in the production management of the organization. In manufacturing organization, the raw material is converted in to finished goods by making various processes; similarly here fish seed are raised in controlled environment to get marketable size fish. Fish are raised in two stages namely Nursery pond and Stocking pond. Fishes need to feed two to three times daily; the feed management is also important part of aquaculture. Feeding should be in adequate quantity, shortage will slow down the growth rate and excess feeding will cause contamination. Not only proper feeding is important but also maintaining water quality is also very important. Parameters such as pH (potential of Hydrogen), temperature, transparency, contamination, dissolved oxygen; etc needs to be regularly checked and controlled timely. Changing water is best way to control all these parameters and maintaining water quality. At least 25 percent water should be changed every month. Quality of controlling function is essential for increasing productivity. Generally the production cycle is of 8-10 months.

Seed production also requires equal attention, but it is for short period of time. Fry sized seeds are imported from other states and is raised to fingerling sized and then it is sold to other pond holders to rise further to marketable size fish. The fry sized seed has drawbacks, there is high mortality rate in this size and fingerling sized cannot be imported because it has high transportation cost. The fingerling sized seed, as per the customers requirement is transported with continues oxygen supply through syntax.

The researcher has selected an organization; name Akpra Aquaculture, Kasegaon, Tal. - Walwa, Dist; Sangli for proposed research. Akpra Aquaculture is well known and only organization in aquaculture field in Sangli district.

Objectives of the Study

1. To study in details, the production process of fish and fish seed in an aquaculture.
2. To study the controlling practices used in the production processes of fish and fish seed.
3. To analyze the growth rate of marketable size fish and fish seeds.
4. To suggest the improvements in production processes of an organization, if necessary

Importance of the Aquaculture Farming

- 1 As the human population continues to grow, finding means to feed those people is one of the most important challenges faced around the globe. Even in troubled economic times, men, women and children need to eat. And a healthy diet, high in protein is necessary to ensure that growing population does not succumb to sickness and disease. Fish and other aquatic organisms fit the model for healthy sources of protein.
- 2 Harvests of wild sources of fish and other aquatic species cannot keep up with the demand presented by the growing human population. Trying to match demand through commercial fishing interests would eventually result in over-fishing and the loss of those species entirely. Therefore, while aquaculture is required to meet the human demand, it also relieves the strain on wild species to allow them to continue to be a significant source.

Importance and Significance of the Study

1. This study helpful to understand details production process of fish and fish seed in an aquaculture.
2. This study helpful to understand the controlling practices used in the production processes of fish and fish seed.
3. This study helpful to analyze the growth rate of marketable size fish and fish seeds.

Research Methodology

Under the Research Methodology the researcher has planning to use primary sources and secondary sources for collection of Data.

Primary Data

The Primary Data collected through Primary Sources. This data is collected by the researcher at first time so it is fresh data under this research study. The researcher has use following primary sources for collecting data.

Discussion Method & Observation Method

Secondary Data

The data collected through secondary sources is called secondary data. The researcher is planning to use following secondary sources for collecting secondary data. Different records related to fisheries department, records maintained by firm, production reports, reference books and websites etc.

Profile of Organization

Company Name: Akpra Aquaculture

The Plant, located in the Kasegaon Village of Sangli District acquired from various breeds of Fishes, reflects the organization a commitment to bring high-quality breeds. It also marks an important step in development its aqua business in India.

The plant is strategically located near Tambave Road, Near Police Station, Kasegaon and known for various fishes such as tilapia, Katla, Rohu, Mrigal, etc.

Data Analysis & Interpretation

Product Details

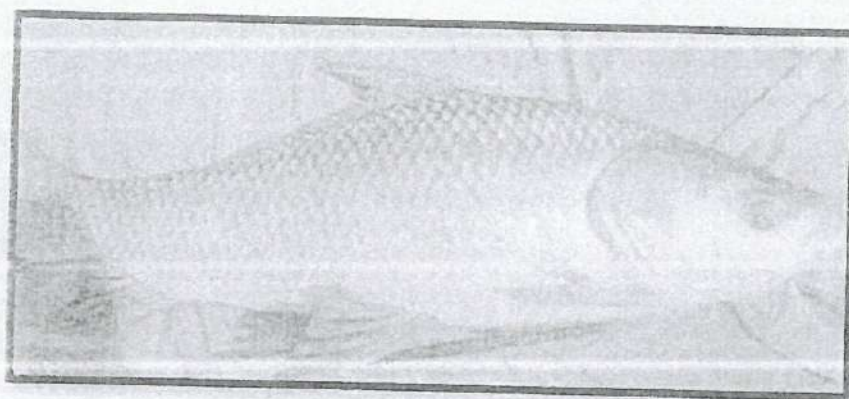
The Akpra aquaculture supplies and serves about 4 -5 types of breeds. It includes Tilapia, Mrigal, Rohu, catla, etc. The plant includes 3 mini square pounds inside the compound wall. Each pound is about 75 x 30 feet. Each pound had different breed. One of pound includes mix breed. The fishes require various types of food also. The food includes the small circular fish feed balls which is ordered from Kolkata.

Feeding: Fish is feed two times daily. About half kilogram of food is gives at single time per day.

Types of Breeds

1. Catla

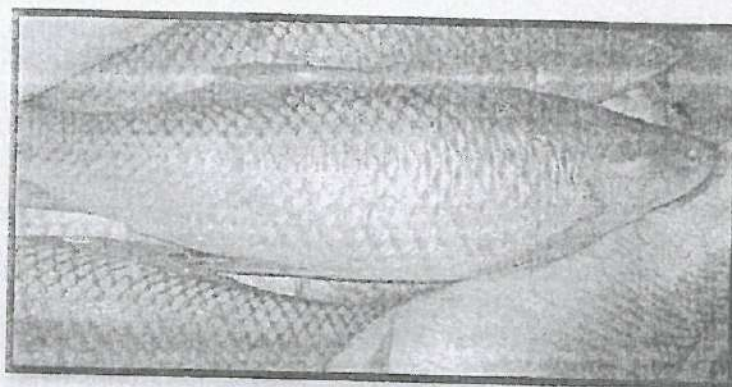
Catla (Catlacatla) is found naturally in the major rivers of North India. It is characterized by its big head, high back, heavy body, heavy lower jaw and the mouth opening upward. There are no hair like processes on the jaws. The back of the fish is gray while the sides are white in colour. But according to the environmental situation catla may be darkish in colour. Catla generally attains maturity during the second year.



They mostly feed on the macro fauna though decaying type of micro flora are also consumed. The mouth being open upwards they collect their food from the upper surface of the water. Hence it is known as a surface feeding fish. If plenty of feed is available and in less crowded situation catla fish may grow up to five kilogram per year. However in a commercially growing condition they attain an average weight ranging between 800 to 1000 grams per year.

2. Rohu

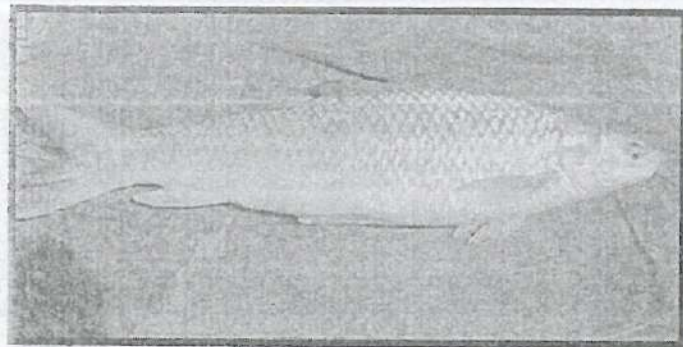
Rohu (*Labeorohita*) is also found commonly in the north Indian rivers. The body is long and round; the head is small and slightly pointed; the back is bent and slopping down both towards the front and back. The upper and lower lips have fold or frills. On the upper lip there may be two hair like structures. In general rohu has slightly reddish gray scales; however the scales on the back have dark brownish colour while those on the underneath and lower sides have less white scales. One of the easily identifying marks is that it has reddish fins (wings).



Though rohu can grow up to 3.5 kg weight within a year in the commercial composite fish culture they are found to grow up to only an average weight ranging between 600 to 1090 grams per year. However it is to be mentioned here that among the recommended carps for commercial growing, rohu is tastier than others. Rohu matures in the second year of its life.

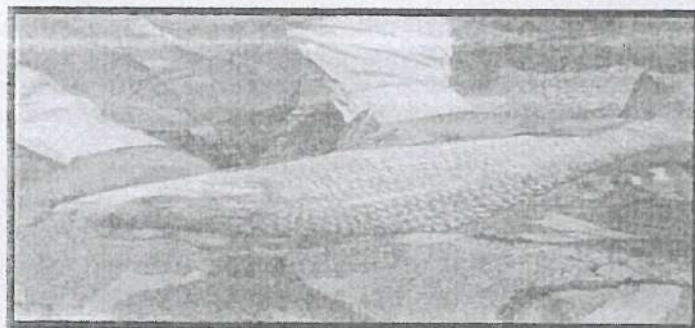
3. Mrigal

Mrigal (*Cirrhinus mrigala*) also like catla and rohu is commonly found in the North Indian rivers. The body of mrigal is longer and less thicker than rohu. The head is small and pointed, the mouth opens downwards; the lower lip has no folds or frills like the rohu. But the upper lip has two hair like structures called barbels. In general the scales are yellowish white in colour though the scales at the back have a grayish look. Mrigal matures in the second year of its life.



4. Tilapia

Tilapia are mainly freshwater fish inhabiting shallow streams, ponds, rivers and lakes and less commonly found living in brackish water. Tilapia fish is a tasty, inexpensive source of protein. It is the second most farmed fish in the world that originated in Africa and the Middle East. It started gaining global popularity after scientists unraveled its innumerable health benefits. Plus, it grows quickly and does not require fancy culture conditions. The popularity of tilapia came about due to its low price, easy preparation, and its mild taste.



30. Human Values and Professional Ethics - A Need of the Hour with Special Reference to Financial Sector

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Abstract

As the Yes Bank fiasco is making headlines, it is high time that the Top management in the financial Sector takes some proactive measures to avoid such deep impacting crisis in the near future. In the turbulent times, especially when COVID-19 (Corono Virus) is having a havoc over the financial sector all over the world and with share markets falling to historic lows, it is high time that Practices of Human Values and Professional Ethics be set out as a Top Priority in the financial sector for the betterment of the Society- Now more than Ever Before.

Keywords- Human Values, Professional Ethics, Commitment, Integrity, Honesty, Responsibility.

Introduction

Yet another Bank joins the long list of Financial Institutions "Biting the Bullet". Yes Bank, which used to be considered as a "Model Bank" in the banking sector, especially in the Private Banking space is placed under moratorium (a keyword which means- Temporary suspension or delay of an activity) by the Reserve Bank of India. The Reserve Bank of India(RBI) found irregularities in the banks accounts as well as governance issues which could have been avoided if certain aspects of professional ethics were being considered by the top management.

Yes Bank is not the only bank in the recent times to have these issues, the list is endless, right from ICICI bank to PMC Bank to the Government owned Punjab National Bank. Apart from the impact that these scandals will have on the Financial sector, the larger impact will be on the public which may start loosing faith in the financial system.

Literature Review

In one of the best-selling books of all times named- 'The Tipping Point', the author Malcolm Gladwell states that a virtue such as integrity is never a basic trait, but it is significantly dominated by the position the person is in. There will be certain situations so powerful which can swamp most of humans even if they are intrinsic predisposition in them. To prove the thought, Mr. Gladwell in the book has cited a landmark set of behavioural observations which were conducted by two United States of America based revered researchers, Mr. Hugh Harthorne & M.A. May. Mr. Hartshorne and May in their experiment, administered various types of tests and assessed around 11,000 school children. The tests were conducted over the course of many months, with the basic motive- to measure honesty. These tests were conducted on a large sample which was varied by subjects, designs, levels etc. & thus the results obtained are according very robust as well as reliable. Some of the test results are clear. A very few set of children will never ever cheat, and a less number will always do, no matter what. Chances are less intelligent children will cheat more than the smarter ones is what the observations find out. The older children as compared to their younger counterparts will cheat more. Observations showed that Girls cheat about as much as boys did. Some people will cheat if there is only an opportunity; whereas some will only cheat if the stakes that they will obtain are high enough to make the cheating "worthwhile"; some will only cheat if the chance of getting caught is comparatively small whereas some will cheat no matter what the chances of getting caught are. If we think wisely, What are the observations that have been presented above mean for our value system as individuals and as members of civilised society. How do we behave in our personal lives as well as in our professional lives? Do we have some double standards that make us weak?

Human Values and Professional Ethics in the Financial Sector

Let us now try to understand issue of human values and professional ethics in the financial sector.

For that, let us go through the basic concepts of Values and Ethics. Values can be defined as "Human values are the virtues that guide us to take into account the human element when we interact with other human beings. Human values are, for example, respect, acceptance, consideration, appreciation, listening, openness, affection, empathy and love towards other human beings.

Ethics, is the discipline concerned with what is morally good and bad and morally right and wrong. It helps us in classifying, what is good and what is bad. It tells us to do good things and avoid doing bad things. So, ethics separates, good and bad, right and wrong, fair and unfair, moral and immoral and proper and improper human action. In short, ethics means a code of conduct. In short, Ethics tells a person how to behave with another person.

When we try to apply the above two concepts to the financial world considering the recent scandals, a few questions crop up:

Is the financial sector slightly dissimilar from the other fields in terms of ethical dimensions?

Or is it so that there is a considerable opportunity or larger desire to deviate and diverge from the straight and tapering path?

Is the power of context more vigorous here? Conversely, is it people of looser ethical standards and values who succeed in the field of finance?

Again, this is a debate that is never ending and which lacks clear cut resolution. At one extreme there have been and there are people who claim that the financial system, at its heart, is about trust. Nowhere it can be found more true than in banking space. The word "credit" itself is derived from the Latin word "credere", which literally means to believe. Trillions of transactions are taking place this very moment and every moment, and all of these are based on one simple notion- trust. Without broad based trust and belief of honest behaviour, it would have been impossible for the financial sector to grow to its present size and significance.

Still we will find people who mock the financial system for their own benefits. People like Ketan Parekh, Harshad Mehta, Nirav Modi, Mehul Choksi, Vijay Mallya, Chanda Kochhar, Rana Kapoor- The list looks endless.

Benefits of following the principles of Values and Ethics for a Business:

As the list of scandals in the financial sectors is endless so is the list of advantages a business can have if its run on the wheels of Values and ethics especially in the financial sector which relies heavily on the concept of Trust. A few to be mentioned are as follows-

- 
- Stop business malpractices
 - Improve consumers confidence
 - Survival of business
 - Protecting consumers rights
 - Protecting employees, shareholders, etc.
 - Develops good relations between business and society
 - Creates good image of business
 - Smooth functioning of business
 - Consumer movement
 - Consumer satisfaction
 - Importance of labour
 - Healthy competition

Now let us try to understand few scams that occurred in the past couple of years. The most recent ne- Yes Bank. A bank that was started from a scratch and which built a huge asset book of more than Rs 3 lakh crore in just a little over a decade was signing and distributing away hefty cheques to nearly each and every borrower who either was on the verge of getting doomed, went bust in the coming future or turned a non-performing asset within years. Infrastructure Leasing and Financial Services Limited (IL&FS), Dewan Housing Finance Limited (DHFL), Jet Airways, Cox & Kings, CG Power, Cafe Coffee Day (CCD) and Altico- you can name a bad boy in the Indian financial services area and we will definitely find YES Bank as a key lender.

The driving force behind the bank was its founder and the Managing Director Mr. Rana Kapoor. He is a foreign banker who has a huge experience in the financial sector. Mr. Kapoor was also very well networked in the corporate as well as financial sector. In fact, he was the mastermind behind most of the large deals and used to cut most of the deals himself. So, it is not possible that whatever wrong doings occurred were without his knowledge. Mr. Kapoor with his astute business acumen had found his niche- to lend to well known companies that were finding it difficult to get finances from current lenders. What looked like a master stroke initially turned out to be Yes bank's nemesis.

But as it is said in the financial sector, a bad loan won't become bad in a overnight. It has to take at least 3-4 years minimum for the stress in the loan to surface and show up. YES Bank's troubles also had kicked off when the economic cycle turned bad and then there were surprises one after another in the last two to three years.

Many bankers within the bank and in the financial sector were aware that Yes bank was getting the loan deals with the promoters of the bank directly without using the safer consortium way. What is more surprising is, it often supported and used to lend the companies that were finding it hard to get a penny from existing lenders. This risky route not only gave the banks, a comparatively higher interest rate from these companies, but also secured a collateral against that loan. But when things started turning bad, Yes bank started to find it difficult to monetise the collateral either. For example, the shares it had as collateral in some companies, their value had deteriorated badly because of the slide in the fortune of the company.

Unethical issues

The Enforcement Directorate (ED) investigation revealed that Rana Kapoor, invested in properties worth over Rs 2000 crore. The development has come after the Enforcement Directorate rigorously questioned Mr. Rana Kapoor, who was later sent to its custody till March 11, 2020. ED sources told the media that all of these properties are located in India. The financial probe agency also suspects that the kickback money which is a form of negotiated bribery is invested by Mr. Rana Kapoor in these properties. According to Enforcement Directorate (ED) sources, plush properties in the United Kingdom have also been identified and an evaluation of the investment is in process. The Enforcement Directorate also suspects that the companies linked to family members of Mr. Rana Kapoor used to receive this kickback money and used to facilitate in laundering of the money received.

Family members of Mr. Kapoor were allegedly involved with opening of multiple companies with the sole intention of money laundering from the scams in Yes bank. Sources from the Enforcement Directorate are of the view that Mr. Kapoors wife, Bindu Kapoor, was a director in 42 companies, whereas daughters Roshni Kapoor and Radha Kapoor are directors in over 20 companies. Probe agency Enforcement Directorate has also found that most of these companies have the same set of directors and these companies have no employees. Also, these companies linked to Mr. Rana Kapoor and his family members hardly did any business but have received huge loans time to time.

Share price erosion of Yes Bank due to the scandal

As can be seen from the image below, the share price had touched a high of 382.85 on 10 August 2018, started to crumble under the pressure steadily. Once the Reserve Bank of India imposed the Moratorium on the Bank the Share prices dropped instantaneously to a low of 5.65.

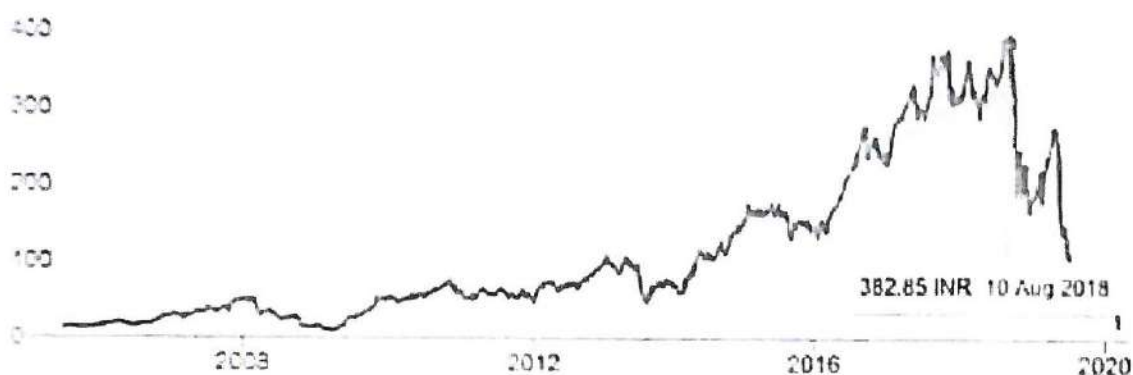
Yes Bank Limited

NSE: YESBANK

25.45 INR +0.40 (1.60%) ↑

13 Mar, 3:30 pm IST - Disclaimer

1 day 5 days 1 month 6 months YTD 1 year 5 years Max



Open	22.55	Div yield	7.86%
High	27.70	Prev close	25.05
Low	21.35	52-wk high	286.00
Mid cap	65.16B	52-wk low	5.65
P/E ratio	-		

Conclusion

If we notice the above scandal minutely, we can come to a conclusion that these crisis has also revealed a grave concern of virtuous hazard in the financial sector and moreover in the banking structural system - something which we can term as the "Privatization of the profits and the socialization of Losses". Banking has enjoyed a unspoken assurance of governments bail out. It holds correct anyway and regardless of whether a very huge segment of the banking part is

possessed by the government administration and is controlled by central banks as in like a country like, or whether the banks are owner and governed privately as in the case above.

Any governments, anyhow and regardless of their political connections and affiliations, can barely even think to afford to have large institutions fail especially in the banking arena. The over confidence of 'too big to fail' syndrome makes possible these financial institutions to take unwanted risks that, say a car manufacturer or for that matter any other industrialist, cannot take. If a bank makes huge amounts of profits, they will be rewarding themselves with generous payment packs, bonuses, ESOP's and what not. But what if the loan turns bad and the same balance sheets crumble under that pressure, maybe the bank has nothing to worry since they are cocksure that they are going be bailed out but this rescue operation will be costly affair and happening at the tax payers expense. This can be termed as "Privatization of the profits and socialization of Losses".

More than the loss of tax payers expense, which can be calculated with the help of few clicks, there is a loss that cannot be calculated- Trust, without which the financial system will have difficult times in the gruelling futures to come. Else, the day won't be far before people with start asking for collateral for keeping their hard money in the banks and "Know your Bank" will be the new norm.

References

- Keynote address by Dr. D. Subbarao, Governor, Reserve Bank of India at the Conference on 'Ethics and the World of Finance' organised by Sri Sathya Sai University, Prasanthi Nilayam, Andhra Pradesh.
- https://en.wikipedia.org/wiki/Chanda_Kochhar
- <http://www.esocialsciences.com/data/articles/Document129200940.9361994.pdf>

Performance Management Practices and its Impact – A Case Study

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Abstract--- One of the tools which is gaining importance in today's scenario is performance management across all sectors as it helps in increasing competitiveness and business. The aim of this study is to find out whether cooperative banks are implementing the performance management practices and if they are followed then what is its impact on the financial performance of the cooperative banks. Urban Cooperative Banks (UCB) in Sangli district has been taken as the sample for the study. It can be concluded that banks in Sangli district are following lots of Human Resource Practice as a part of Performance Management Practices (PMP). Some of these PMP are having significant impact on the financial performance of the banks. Study shows that more structured and modern approach of Performance Management has to be followed and concepts like CLV, MBO and BSC needs to be incorporated to measure performance of the employee in the Performance Management Process of these banks.

Keyword--- Performance Management, Cooperative Banking, Management by Objective, Financial Performance.

I. Introduction

India is the second largest market in the world and because of that every industry is interested in expanding their business in India. Banking sector is even not an exception to this and growth of banking sector in this typical period has been noted as one of the greatest growth. Due to this as mentioned above, lot of reforms are brought into the banking sector aiming at growing the market share, profitability and productivity of the nationalized banks that nearly controlled 90 % of total advances deposits and assets.

Foreign and Private Banks started pouring in India and expanded their network and because of the increase in the number of players in the market everybody started attacking market to acquire maximum market share and this has laid to the acute competition in the market. As everybody knows the basic rule works in the competition is "survival of the fittest".

Today the industrial reforms, shareholder's and other stakeholder's expectations by the service providers has also forced the banks to grow and to change accordingly. In addition to this Globalization has brought the diversity in the culture and this has encouraged us to change than ever before. We have been forced to adopt different management theories, practices and values. The emphasis on cost cutting, customer relationship management, customer satisfaction and being prompt and competitive makes it even more open to change. It is a human tendency to say no to change and to oppose the change process. Accepting Operational, structural, functional or strategic Change by the top management and employees is very important.

Now-a-days many of the banks are equipping themselves with sophisticated technology and even are having high-tech service network but despite this, some of the banks are performing in very bad shape and with lots of bad debts, large NPAs and negative Net worth, which causes them in merging themselves with other successful banks. It clearly shows that having technological modernization and copying the products and services of highly successful Foreign and Private banks is not sufficient but we have to talk about managing the performance of Human Resources in right directions and with focused approach towards decided objectives, which plays very important role and this along with modern technological services and products will keep banks ahead in the competition and bring them glory and success to achieve their pre decided objective. In all Performance Management has to be properly implemented and that too specifically in cooperative banks.

1.1 Need of Performance Management Practice in Cooperative Banking

As we all know, the economic scenario is changing very rapidly since 1991 when then Prime Minister Hon. P.V. Narsimhrao has signed GATT treaty. We also talk about it, as a borderless or open economy. This has changed all the equations of the market irrespective of the sector and it is affecting the Banking sector. Acceleration of change is tremendous and "Adoption" and "Change" are two parameters which will play important role in surviving in the market as far as organizations are concerned. For cooperative banks leaders has become very important to understand this dynamic and tricky environment to navigate their organizations, banks out of the danger zone.

These leaders should know the underlying trends and their implications. In all leaders and management of cooperative banks should change their mindset to understand, adopt and respond for changing their strategies to strengthen their base. This includes adapting to the new cultural change. In such cases Human Resource of the organizations play tremendous role and without them you cannot talk of sustaining in this highly competitive environment.

II. Literature Review

This study of Jharana Kalra [1] on "performance management system in Banks of India" is on one of the tool of performance management practice which is mostly use in banks. That tool is performance appraisal of employees. This study is a critical study of performance appraisal practices. This study says that managers should take their subordinates into confidence while conducting appraisals. This study also underlines the importance of performance management system in the today's HRM.

Ms Ayesha Yaseen has conducted the research on "Performance Management Practices and Its Impact on Banks' Performance" [2]. Her research finding has brought out some facts about the relationship in between performance management practices and productivity. It also talks about the positive relationship in between loyalty, effectiveness and motivation with Performance Management systems. According to her study if there is lack of handholding and feedback in the total process of appraisal then that leads to dissatisfaction in the employees. This study is conducted in Pakistan and its relevance we can feel here in India also.

The Hindu: Mumbai Capital [3] had given an article on the performance management practices implemented in State Bank of India (SBI). The article states that SBI is a bank with approximately 2.13 lakhs of employee working with it. Looking at the banking scenario around, State of Bank of India has introduced Performance Management System for its 1.70 lakhs of employees as a part of their process. Government of India has taken an initiative through Finance Ministry to develop the skills of employees of public sector banks and even for knowledge management. This initiative is taken by the name of "Indradanush". Under the same program and after rigorous implementation of the PMS SBI has landed in good results. The bank's business per employee has increased from Rs.7.04 crore to Rs.12.34 crore between Financial Year 2011 to 2015. Profit per employee also increased from Rs.3.85 lakh Rs. 6.02 lakh in the same tenure.

The study of implementation of Performance Management System in Habib Bank Ltd [4] has thrown a light on the important side of the PMS. The results of this study shows that employees did not know the purpose behind the implementation of such system and employees were filling up the information in the forms just as the formality. Some of them were thinking that the system running in the organization is useless and it is wastage of time. Even after filling up the information in the forms of PMS there was lack of feedback from the supervisors. This clearly shows that communication before implementation of PMS is a need for the success of the system in the organization. In fact PMS is a continuous and ongoing process so proper guidance depending upon the results of appraisals is the backbone of PMS.

The paper was published by Arshad Siddiqi [5] in September 2009 in the conference located at Karachi, Pakistan. The focus of the study was to find out the relationship in between Performance Management System and Job satisfaction and ultimately contribution of it in achieving organizational goals. The study says that performance Management System is the ongoing process and performance of the employee needs to be monitored on daily basis. Basically Performance Management System believes in the strong relationship in between employee and immediate supervisor. This relationship is like mentor and mentee relationship. Study further states that if there is a failure by the employee in the process then it is because of the failure of supervisor and if there is an achievement by employee then it is directly attributed to the mentor i.e. supervisor. More precisely Performance Management System is not a performance measurement it is observing and enhancing on daily manner.

Research of Kipsegerwo Evans Kibichii, Dr. Kimutai Geoffrey Kiptum and Prof. Kimani Chege [6] on "Effects of Performance Management Process on Employee Productivity: A Survey of Commercial Banks in Turkana County" shows that the implementation of Performance management process in the organization has a significant relationship with employee productivity. According to study performance appraisal system, employee training and development and reward system are the components of performance management process and they have a positive relationship with the employee performance in commercial banks. Typically effective Reward system has a significant relationship with employee performance. Study shows that non-monetary bonuses like vacations or a simple thank-you, club membership, parking slots, and monetary benefits like car loans, medical covers, company

cars motivates employees, improves the employee morale which in turn leads to increased volume of sales, customer retention and quality output, and ultimately improved productivity.

The purpose of the study of Prasanna Singh [7] on "Performance Management Practices in Banks- A comparative Study of ICICI bank and SBI" is to compare the performance management practice of ICICI bank and SBI and to analyze which practice is effective and productive. This is a study which is conducted on planning, monitoring, evaluating and rewarding the performance and the challenges faced in the process. Author has brought a very important point in the discussion and it is that Performance Management Practices are introduced long back in western countries but it is previously an ignored area of HR in Indian Banking and that is why the image of commercial banking in India is not good. Now commercial banks have understood its importance and they have started implementing the same in their banks. The result shows that though it is beginning of use of Performance Management System in Banks, employees feel that this system allows them to align individual objectives with the organizational objectives. In ICICI individuals are charged with responsibility and are held responsible for assigned task. Employees in ICICI are well trained and it communicates its expectations to employees very clearly. The rewards are as per performance. In SBI the decision is with board and employees are not involved in it. ICICI clearly develops written job profiles. It is noticed that SBI is very effective in planning but are not effective in monitoring.

Many banks are positioning themselves as one stop banking for the customer. Improved technology is changing the face of today's banks and they are changing their format from "Brick and Mortar" branches to "Click and Portal" banking. Though the technological developments are very dynamic, the emphasis on development of Human Resources is not reduced because it is always the need of time. The Performance Management System in HDFC [8] is being implemented in following way. HDFC bank believes in empowering its employees and are working on the lines of Management by Objectives (MBO). In fact HDFC is emerging as one of the strong employer brand in financial service sector. Though they are strongly positioned themselves in the banking sector still they are striving hard to be the best and preferred by the customer in the sector. Bank constantly taking efforts on employee training that too both "on the job" and "classroom one". Bank strongly believes that broader employee ownership has a positive impact on performance.

This study is conducted in Nigeria by Eboh, Ezionye .F, Eke, Uke, M, Agu Godswill Agu [9] to analyze the use of performance Management in Nigerian banks and to assess the commitment of leadership towards the effectiveness of performance management. Study was conducted on Ecobank, Diamond bank, and United Bank for Africa (UBA), Access bank, and First Bank Nigeria in Umuahia, Abia State banks. It has concluded that in Nigeria the performance Management is applied in the above mentioned banks further it is found that effective performance management reduces the employee turnover and enhances the quality of the work. Study also shows that there is significant and positive relationship in between leadership commitment and performance management effectiveness. Even it is found that there is a significant positive relationship in between communicating strategy to staff and performance management.

III. Research Methodology

Comparatively cooperative sector is very small and Cooperative banks may lack in responding to the changes in the market. There is a relationship in between Human Resource Practices used and its impact on the financial performance of the banks. Performance Management Practices are the part of this Human Resource Practice. The purpose of this study is to find out the relationship and impact of performance management practices on financial performance of the cooperative banks.

Hypothesis

H1: Employee's satisfaction as a result of Performance Management Practices has an impact on financial performance of urban cooperative banks

IV. Research Design

The descriptive research design is adopted for the study where the observation of selected variables is made and behaviors are identified and described. For the purpose of the study both primary and secondary data are collected.

Primary data is collected in the form of Questionnaires from two types of respondents in the following way.

- Questionnaire for Employees of the selected UCBs of Sangli to find out information related to the research area.

- Questionnaire for customers of selected UCBs of Sangli to find out there inclination in respect to customer satisfaction and expectations.

V. Testing of Hypothesis

5.1. Sub Null Hypothesis

Employee satisfaction as a result of performance management practice like maintaining pleasant atmosphere in the bank has no impact on business done per employee.

Table 1: Business Done per Employee Vs Bank Atmosphere is always Pleasant

		Bank atmosphere is always pleasant				
		Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Business done per Employee	Rs 273.84 Lakhs	0	0	15	27	42
	Rs 360.00 Lakhs	0	0	17	32	49
	Rs 394.46 Lakhs	1	0	14	47	62
	Rs 421.18 Lakhs	0	0	0	34	34
	Rs 821.84 Lakhs	3	2	41	117	163
Total		4	2	87	257	350

Table 2: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.318 ^a	12	.046
Likelihood Ratio	31.094	12	.002
Linear-by-Linear Association	.000	1	.986
N of Valid Cases	350		

Table 3: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.240	.046
N of Valid Cases		350	

Applying the SPSS package to the table no. 6.1.1, 6.1.2, 6.1.3. Using the Chi square test, the calculated $p = 0.046$ is less than $p_0 = 0.05$. Hence null hypothesis is false at 5% level of significance, with contingency coefficient $r = 0.240$ significant correlation.

Therefore, there is reason to accept the alternative hypothesis with 95% confidence that "Employee satisfaction as a result of performance management practice like maintaining pleasant atmosphere in the bank has impact on business done per employee."

5.1.1. Sub null Hypothesis: Pleasant bank atmosphere in the bank has no impact on the profit earned per employee of the bank

Table 4: Table of Profit Earned per Employee vs. Bank Atmosphere is always Pleasant

		Bank atmosphere is always pleasant				
		Strongly Disagree	Disagree	Agree	Strongly Agree	Total
Profit Earned per Employee	Rs 1.35 Lakhs	0	0	15	27	42
	Rs 1.72 Lakhs	1	0	14	47	62
	Rs 2.05 Lakhs	0	0	17	32	49
	Rs 2.75 Lakhs	0	0	0	34	34
	Rs 4.04 Lakhs	3	2	41	117	163
Total		4	2	87	257	350

Table 5: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.318 ^a	12	.0461
Likelihood Ratio	31.094	12	.002
Linear-by-Linear Association	.037	1	.847
N of Valid Cases	350		

Table 6: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.240	.0461
N of Valid Cases		350	

Applying the SPSS package to the table no. 4, 5, and 6 and Using the Chi square test, the calculated $p = 0.0461$ which is less than $p_0 = 0.05$. Hence null hypothesis is false at 5% level of significance, with contingency coefficient $r = 0.240$ significant correlation.

Therefore, there is reason to accept the alternative hypothesis with 95% confidence that "Employee satisfaction as a result of performance management practice like maintaining pleasant atmosphere in the bank has impact on profit earned per employee."

5.1.2. Sub null Hypothesis: Pleasant Atmosphere in the Bank has no Impact on Gross NPA of the Bank

Table 7: Gross NPA (%) * Bank Atmosphere is always Pleasant

		Bank atmosphere is always pleasant				Total
		Strongly Disagree	Disagree	Agree	Strongly Agree	
Gross NPA (%)	5.13 pc	3	2	41	117	163
	4.30 pc	0	0	15	27	42
	2.24 pc	0	0	17	32	49
	1.90 pc	1	0	14	47	62
	0.41 pc	0	0	0	34	34
Total		4	2	87	257	350

Table 8: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.318 ^a	12	.0463
Likelihood Ratio	31.094	12	.002
Linear-by-Linear Association	5.915	1	.015
N of Valid Cases	350		

Table 9: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.240	.0463
N of Valid Cases		350	

Applying the SPSS package to the table no. 7,8,9 and using the Chi square test, the calculated $p = 0.0463$ which is less than $p_0 = 0.05$.

Hence null hypothesis is false at 5% level of significance, with contingency coefficient $r = 0.240$ significant correlation.

Therefore, there is reason to accept the alternative hypothesis with 95% confidence that "Employee satisfaction as a result of performance management practice like maintaining pleasant atmosphere in the bank has positive impact on Gross NPA".

5.1.3. Sub Null Hypothesis: Employee satisfaction as a result of performance management practice like conducting training program in the bank has no impact on business done per employee.

Table 10: Profit Earned per Employee * The Satisfaction with Training Program by Bank

		The satisfaction with training program by bank		Total
		Yes	No	
Profit Earned per Employee	Rs 1.35 Lakhs	42	0	42
	Rs 1.72 Lakhs	60	2	62
	Rs 2.05 Lakhs	48	1	49
	Rs 2.75 Lakhs	34	0	34
	Rs 4.04 Lakhs	161	2	163
Total		345	5	350

Table 11: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.701 ^a	4	.609
Likelihood Ratio	3.402	4	.493
Linear-by-Linear Association	.101	1	.751
N of Valid Cases	350		

Table 12: Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.088	.609
N of Valid Cases	350	

Assuming the null hypothesis.

Conclusion

Data analysis by Chi square test:

Applying the SPSS package to the table no.10,11 ,12. Using the Chi square test, the calculated $p = 0.609$ which is greater than $p_0 = 0.05$. Hence null hypothesis is true at 5% level of significance, with contingency coefficient $r = 0.088$ insignificant correlation.

Therefore, there is reason to accept the null hypothesis with 95% confidence that "Employee satisfaction as a result of performance management practice like conducting training program in the bank has no impact on business done per employee."

Business done per Employee * Job profile was clarified at the time of induction				
5.1.4. Sub Null Hypothesis : Clarification of Job profile at the time of induction has no impact on Business done per employee of the Bank				
Table 13				
		Job profile was clarified at the time of induction		Total
		Yes	No	
Business done per Employee	Rs 273.84 Lakhs	42	0	42
	Rs 360.00 Lakhs	47	2	49
	Rs 394.46 Lakhs	61	0	61
	Rs 421.18 Lakhs	34	0	34
	Rs 821.84 Lakhs	163	0	163
Total		347	2	349

Table 14: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.315 ^a	4	.015
Likelihood Ratio	7.924	4	.094
Linear-by-Linear Association	2.524	1	.112
N of Valid Cases	349		

Table 15: Symmetric Measures

	Value	Approx. Sig.
Nominal by Nominal Contingency Coefficient	.185	.015
N of Valid Cases	349	
Assuming the null hypothesis.		

Conclusion

Data analysis by Chi square test:

Applying the SPSS package to the table no. 13,14,15. Using the Chi square test, the calculated $p = 0.015$ which is less than $p_0 = 0.05$. Hence null hypothesis is false at 5% level of significance, with contingency coefficient $r = 0.185$ significant correlation.

Therefore there is reason to accept the alternative hypothesis with 95% confidence that "Employee satisfaction as a result of performance management practice like clarifying job profile at the time of induction has positive impact on business done per employee".

5.1.5 Sub Null Hypothesis: Employee Satisfaction with training program as a result of performance management practice has no impact on Business done per employee of the urban cooperative banks.

Table 16: Business done per Employee * The Satisfaction with Training Program by Bank

		The satisfaction with training program by bank		Total
		Yes	No	
Business done per Employee	Rs 273.84 Lakhs	42	0	42
	Rs 360.00 Lakhs	48	1	49
	Rs 394.46 Lakhs	60	2	62
	Rs 421.18 Lakhs	34	0	34
	Rs 821.84 Lakhs	161	2	163
Total		345	5	350

Table 17: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.701 ^a	4	.609
Likelihood Ratio	3.402	4	.493
Linear-by-Linear Association	.006	1	.941
N of Valid Cases	350		

Table 18: Symmetric Measures

		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	.088	.609
N of Valid Cases		350	
a. Assuming the null hypothesis.			

Conclusion

Applying the SPSS package to the table no. 16, 17,18 and using the Chi square test, the calculated $p = 0.609$ which is greater than $p_0 = 0.05$. Hence null hypothesis is true at 5% level of significance, with contingency coefficient $r = 0.088$ insignificant correlation.

Therefore, there is reason to accept the null hypothesis with 95% confidence that "Employee Satisfaction with training program as a result of performance management practice has no impact on Business done per employee of the urban cooperative banks.

VI. Conclusions

Therefore, one can conclude that Employee satisfaction as a result of performance management practice like maintaining pleasant atmosphere in the bank has impact on business done per employee, profit earned per employee and on Gross NPA.

On the other hand employee satisfaction as a result of performance management practice like conducting training program in the bank has no impact on business done per employee whereas employee satisfaction as a result of performance management practice like clarifying job profile at the time of induction has positive impact on business done per employee.

Employee Satisfaction with training program as a result of performance management practice has no impact on business done per employee of the urban cooperative banks.

References

- [1] Jharna Kalra. Performance management system in banks of India. *Pune Research Discovery* vol. 2 issue 3, pp.1-6
- [2] Ayesha Yaseen. Performance Management Practices and Its Impact on Banks' Performance in Pakistan. *International Journal of Human Resource Studies* ISSN 2162-3058 2015, Vol. 5, No. 4, 110- 127
- [3] SBI. Performance management system. *The Hindu :Mumbai Capital*
- [4] Muhammad zulqarnain Asab. Performance Management System. *Habib Bank Limited*. www.researchgate.net
- [5] Arshad Siddiqi. The impact of Performance Management System on the performance of the employees & the organization. <http://ieeexplore.ieee.org>
- [6] Kipsegerwo Evans Kibichii, Dr. Kimutai Geoffrey Kiptum, Prof. Kimani Chege. Effects of Performance Management Process on Employee Productivity: A Survey of Commercial Banks in Turkana County. *IOSR Journal of Business and Management* (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 18, Issue 11. Ver. IV (November. 2016), PP 52-64
- [7] Prasanna Singh. Performance Management Practices in Banks- A comparative Study of ICICI bank and SBI. https://www.academia.edu/20320231/PERFORMANCE_MANAGEMENT_IN_BANKS_1
- [8] HDFC Bank. Performance Management Practice in HDFC bank. <https://www.slideshare.net/SMITARASTOGI3/pms-in-hdfc-bank-63765050>
- [9] Eboh, Ezionye .F, Eke, Uke, M, Agu Gods will Agu. Assessment of Performance Management in the Banking Industry in Nigeria: A Study of Selected Banks. *International Journal of Social Science and Humanities Research* ISSN 2348-3164 (online) Vol. 5, Issue 2, pp: (740-752), Month: April - June 2017.

Preparing Industrial Revolution 4.0 (IR 4.0) Ready Graduates

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Abstract

Industrial revolution 4.0 is characterized with use of cyber - physical systems to automate, monitor and analyze business. The students have access to volumes of information available a click away. Developing the graduates with the futuristic skills is a major challenge in front of educators. The case discusses the pro-activeness of Rajarambapu Institute of Technology (RIT) such as designing innovative teaching strategies, preparing faculties and students and developing smart infrastructure in responding to the changing needs of the industries. At RIT, the challenges are even more intensified as most of the students are first generation learners belonging to farmers' families. Team RIT worked with a belief that together they can bring the change. The study concludes that a triangular systems approach can help the institutes transform and develop the IR4 ready graduates. The three pillars i.e. Management & faculty, industry and learning systems should be inextricably intertwined with only student as the focus to achieve the expected outcomes. The findings will also prove to be an initial source of reference for other engineering institutes to bring in the educational transformations. Although Industry 4.0 is the buzzword, very few technical institutes understand and realize the concept in detail. This case study will help technical institutes to identify the factors which they have to assess critically and act upon for preparing graduates with futuristic skills.

Keywords : Professional Education, Industrial revolution 4.0, Teaching Pedagogy, RIT

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Introduction

From the first industrial revolution at the end of eighteenth century, which started with the use of water and steam engines, the world consistently moved through second and then third industrial revolution. The world is now in fourth industrial revolution (IR4.0) is complementing what started in third by enhancing it with artificially intelligent autonomous systems. In simple words, Industry 4.0 is optimization of Industry 3.0 as the basic difference is that in Industry 4.0, the machines work autonomously without the intervention of a human, whereas in the industry 3.0 the machines were only automatized with a need of human intervention. Now as the future of industry 4.0 is unfolding everything and everyone is networked. Internet of things, clouds, 3D printing, robotics etc. had become the buzzwords suddenly. Companies who have adopted are realizing the potential of IR4.0 are upskilling their workforce and recruiting new employees with the right skills. One of the important point is the impact of IR4.0 on employment. IR4.0 will bring higher level of automation and interconnectivity in industrial processes. The tools, technologies and skills required to handle them are expected to be different from what they are at present. New job opportunities that will emerge includes Artificial Intelligence, Robotics, 3D printing, Digital marketing, Cyber Security Specialists so on and so forth. But for shaping students for this new world, we need a planned and systematic approach and collaboration across sectors. This also requires a major overhauling of Indian higher education specifically technical educational institutes. This has put forth new challenges in front of educators of institutes imparting professional education. Some of these challenges include Training and Continuing Professional Development as priority areas for actions within industry 4.0 implementation (Kagermann, Helbig, Hellinger, & Wahlster 2013, Engineer 2020), need of New learning approaches (Abele et al., 2015, Engineer 2020) and developing Strong Skills in Human Relations (Male, Bush & Chapman 2010). According to a survey conducted by Deloitte (2019) 60% of the students surveyed responded that their college or university did not prepare them for the job they want and 79% of them

reflected that they had to go outside of formal college for learning the required skills. In view of readiness for the IR 4.0 workplace, the management wondered – What could be the skills we need to develop in our students to keep up the pace? Do our graduates understand IR 4.0 and its impact on the future workforce requirements? Are they aware of the skills this industry is looking for? Are they prepared for this ever evolving and dynamic digital workplace? To explore answers to these questions we captured the experiences of the management and faculty of Rajarambapu Institute of Technology, an emerging leader in Maharashtra.

Methods

The study is based on content analysis of secondary data. The data was collected from the institutional websites, news paper reports, magazine articles, review comments on social media websites, annual reports for NAAC and NBA. The documents and reports were manually screened and analyzed by the authors. To confirm the reliability and validity the questions stated by Stewart & Kamins (1993) were focused.

Findings

Realizing the needs of IR4.0, the management and senior faculty members at Rajarambapu Institute of Technology (RIT) initiated steps in the direction to find answers to these questions. RIT is a well-known Technical Institute in the Western Maharashtra. It is an integrated campus offering undergraduate and postgraduate programs in engineering and management. It is in a rural township where most of the students are first generation learners coming from farmers' families. They are fully reliant on their academic curriculum and faculty to make them job ready. The faculty started with evaluating and assessing the curriculum to find its effectiveness in providing the right exposure and real-world insights to the students preparing to enter the workforce and to find what they need to add and scale up besides improving academic curriculum. The initiatives discussed below had started the process of equipping future talents for this ever-evolving technological workplace.

Some of these initiatives were designed keeping in view the six IR 4.0 building blocks (Kirchner, 2017) and changes expected in education (Lodder, 2016).

RIT's Response Initiatives

There were three major areas in which Team RIT worked viz. Connecting Curricula and Industrial Success Skills, Developing students and Faculty 4.0 and Smart Infrastructure. These initiatives were also aligned with and incorporated in the strategic plan of RIT. The strategic plan at RIT is developed as per the One Page Strategic Plan (OPSP), a simple but powerful tool developed by Verne Harnish which kept all stakeholders on the same page literally and figuratively. It also helped in achieving desired results by bringing better alignment, execution and accountability.

Initiative 1: Connecting Curricula and Industrial Success Skills

According to a report published by McKinsey Global Institute based on an analysis of 750 occupations, 51% of the job activities will get automated, making many of the current skills redundant. Hence, to prepare graduates for the workplace of future, it was important to identify the skillset and to incorporate futuristic courses in curriculum. The department advisory board members visited many industries in major industrial areas in Maharashtra, conducted video conference calls with various company officials in India and held discussions with the Deans in Universities abroad through our global connect with GEDC, IFEEES, IUCEE, ISTD and ISTE. The inputs received were brainstormed at department levels first and then were discussed in the steering committee of the institute. The skill sets which needed to be developed for making graduates IR 4.0 ready were compiled. The curriculum revamping was the next step. The following were the major changes incorporated:

1. Introduction of multidisciplinary electives
2. Major and Minor Specializations
3. Interdisciplinary projects
4. Blended learning modules
5. Life skill development courses for students and faculties
6. Credit transfers from courses taken from other universities or industries.
7. Value added industry recognized advanced certifications
8. Compulsory soft skill courses for professional development
9. Certification in Foreign Languages like Japanese and German

10. Introduction of machine learning languages, big data processing and coding for all programs

As today's learners are tech savvy, they want to engage in learning processes through multiple modes as per their convenience and pace. Hence, our curricular content is made available through multiple modes -Blended (Through MOODLE and MHRD collaborations) , Online (MOOCs) and on campus learning.

As sensitivity to society was one important skill, community-based projects were introduced in all programs. We adopted nearby villages, worked with local government and successfully provided technical solutions to their problems. To illustrate a major project , we worked with Islampur municipal council in developing smart city Islampur planning aiming at sustainable development.

The elements of humanities and arts are also introduced in the curriculum to make our students capable of handling human-machines interactions.

We had developed strong connect with around 400 industries which supported us in designing a dynamic curriculum to impart the future technical competencies in graduates. The quality and standard of curriculum was reflected when experts from AICTE, NBA committees and various other government bodies gave positive feedback regarding the connectivity of curriculum with required futuristic skills. As a process, we regularly take feedback from our employers and officials of top MNCs appreciated the learnability and adaptability of our alumni and the passing out graduates.

To quote an HR of Big Retail House "*I was considering Amit(Pseudo name) as a fresher , but to my surprise , within two months he has created such an image among his team and customers that all our customers come to us asking about him. He has excellent learning and communication skills.*"

We also conduct alumni survey on curricular aspects. The average rating provided by the alumni on the relevance of curriculum pertaining to current and future skills required by industry is above 9 out of a ten point rating scale every year.

Initiative 2 : Developing students and Educators 4.0

"65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist.." (World Economic Forum, 2016)

It was quite apparent that student should be central to education to prepare them for jobs that don't exist yet.

All the efforts like curriculum design and reforms, pedagogy, trainings (In-house and industrial) , evaluations design should focus on developing the student for future workplace. The most important attributes which must be developed in students are Innovative & Growth mindset, Creativity, Emotional intelligence, Interdisciplinary collaboration, Cognitive Flexibility, Algorithm and logic etc. Once the student enters their professional career, they will need to apply these skills and to impart them we need creative educators. Our brainstorming revealed two aspects:

- Educators and students need to change mindset
- Redesigning teaching

We understood that preparing students 4.0 will need changing mindset of educators, they being the major change makers . The educator's strategy should be to adapt to the changing requirements or perish. Gerstein (2014) stated that educators must move on from fixed mindset to growth mindset which will enable them from feeling powerless and helpless to feeling of empowerment to positively influence the learner's community. We at RIT understood that growth mindset is key to develop educators 4.0. Several workshops were conducted to imbibe growth mindset in faculty. This made the future processes easier. The educators understood that their role is to facilitate learning, they are not knowledge transferers. Today's students have access to huge information. Apart from instructor led sources, they wish to learn from multiple modes enabling them to learn at their own pace The educators started looking for new approaches to learning. Blended/hybrid learning approaches, innovative teaching methods like inquiry based learning, problem and project based learning became an integrated style of our educators. These approaches helped develop growth mindset among students as well enabling them to become lifelong learners. To put in short, the approach of heutagogy is being used by the educators at RIT, which means they are adopting a student – centered instructional strategy focusing the

development of capacity, capability and autonomy among students. Winning the awards mentioned below and the placements of the students indicate the success of our efforts.

Initiative 3 : Developing Smart Infrastructure

The future jobs will be in the new areas like artificial intelligence, Robotics, digital marketing, 3D printing, cyber security and more. To Facilitate imparting future skills for such jobs for IR 4.0 a big change in infrastructure was also required. The following actions were undertaken to develop infrastructure:

- All classrooms in the institute are smart with interactive white boards in every department.
- Separate IoT labs by departments of Computer engineering, Information Technology and Electronics and Telecommunication Engineering with different kits from arduino, Intel, Raspberry, controller and Amazon cloud instances are used
- Robotics and drone lab
- Computer graphics and virtual reality labs with opengl and CUDA computing facilities used
- Machine learning/AI lab having python programming with high computing facilities..
- 3D printing lab
- Living Labs: Build an Autonomous Electric Vehicle (AEV) which helped in developing a product based learning framework. (Exhibit I).
- A well-equipped multi storeyed independent Library.

The infrastructure was developed in consultation with industry experts. Most of the laboratories are sponsored by industries. This infrastructure helped impart IR 4.0 skills in graduates to a great extent. They have won several awards at national and international level like

1. RIT's NRiT Dream Team 1% Secured 1st Rank in COVID-19 Innovation Challenge Organized by Atal Incubation Centre – Sri Krishnadevaraya University AIC-SKU, Andra Pradesh

2. Team Luftwaffe 6.1 (Go-Kart Racing Team) has again grabbed All over India 1st rank in the final round of Go-Kart Racing Championship
3. RIT wins 14th State Level Award for Excellence in Energy Conservation and Management, MEDA Pune
4. RIT is awarded with Best Autonomous Institute with Global vision at the hands of Hon. Vinod Tavade, Education Minister, Govt. of Maharashtra
5. RIT Declared as a "Most Innovative Brand" in Maharashtra by Maharashtra Lokpriya Brand 2019 (Arthsanket)
6. Team Luftwaffe 5.0 (Go-Kart Racing Championship) has received 1st rank in final round of Go-Kart Racing Championship. The event was organized by Indian society of New Era of Engineers (ISNEE) and was held at Buddh International Circuit, Noida.
7. TEAM NEQUIT 4.0 has secured ALL INDIA RANK 18 among 126 teams in SUPRA 2018 organized by SAE INDIA and sponsored by Maruti Suzuki.

Conclusion

“ In the new world, it is not the big fish that eats the small fish , it's the fast fish that eats the slow fish”

*Klaus Scwab, Founder and
Executive Chairman , World Economic
Forum*

We at RIT understood that if we delayed our efforts in bringing in the change, our students will not be able to cope up in the new world as, today we are in a situation where we are preparing the graduates for the jobs that don't exist, by using technologies for the future and trying our level best to impart the industry relevant futuristic skills like analytical and problem solving skills for solving problems which are not known yet. Obviously, it is a challenging task for all professional educators and institutes.

The initiatives at RIT discussed above show the efforts team RIT is taking to develop workforce of the future. It is triangle with systems at one end, faculty at another and industry at the third vertex with students as the centre with heutagogy as the process, very similar to the service triangle.

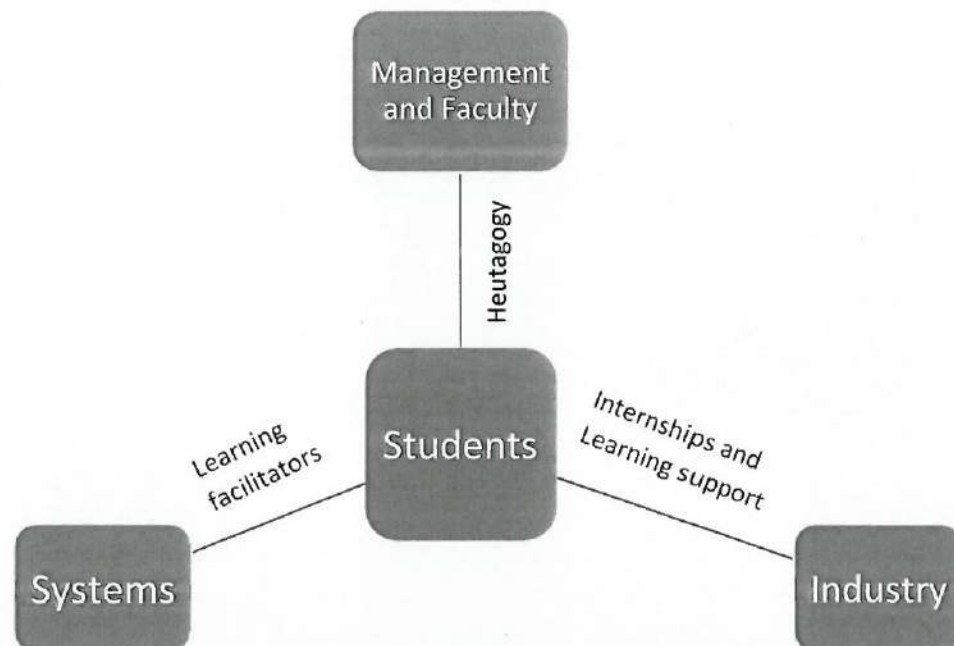


Figure 1 : The Collaboration Triangle – A systems Approach

In the time where speed is the new currency of business (Marc Benioff, chairman and CEO ,Salesforce), all institutes must take collaborative efforts with industry to develop a workforce for the industrial revolution 4.0 .

The findings of the study can prove to be helpful to other technical institutes to identify the factors which they have to asses critically and act upon for preparing graduates with futuristic skills. It will also serve as the guideline to understand the direction of initiatives needed to sustain in IR4.0.

References:

1. Kagermann, H., Wahlster,W., Helbig, J.(2013). Recommendations for implementing the strategic initiative Industrie 4.0. Final report of the Industrie 4.0 Working group
2. Male, Sally & Bush, M.B. & Chapman, Elaine. (2010). Perceptions of competency deficiencies in engineering graduates. 16. 55-67.
3. Abele, E., Metternich, J., Tisch, M., Chrysosolouris, G., Sihn, W., ElMaraghy, H., Hummel, V., Ranz, F. (2015). Learning Factories for research, education, and training. Key note paper of the 5th International Conference on Learning Factories. Procedia CIRP
4. Gerstein, J. (2014). Moving from Education 1.0 Through Education 2.0 Towards Education 3.0. Experiences in Self-Determined Learning., 83–98. Retrieved from http://scholarworks.boisestate.edu/edtech_facpubs/104
5. Kirchner, M. D. (2017). Teaching the Industrial Internet of Things Preparing Students and Learners for Industry 4.0, (September), 0–17.
6. Lodder, J. (2016). The Fourth Industrial Revolution and the Education System,how to respond? Retrieved from <https://www.linkedin.com/pulse/fourth-industrial-revolution-education-system-how-respond-john-lodder>
7. Stewart, D. W., & Kamins, M. A. (1993). Secondary research: Information sources and methods. Newbury Park, CA: Sage.

Exhibit I : Autonomous Electric Vehicle (AEV)
project started in RIT in collaboration with NETRA

