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FARMERS' SATISFACTION TOWARDS DRIP IRRIGATION SYSTEM WITH SPECIAL REFERENCE TO ERODE DISTRICT, TAMIL NADU

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Abstract

Drip irrigation is a type of micro-irrigation system that has the potential to save water and nutrients by allowing water to drip slowly to the roots of plants, either from above the soil surface or buried below the surface. The goal is to place water directly into the root zone and minimize evaporation. Drip irrigation systems distribute water through a network of valves, pipes, tubing, and emitters. Depending on how well designed, installed, maintained, and operated it is, a drip irrigation system can be more efficient than other types of irrigation systems, such as surface irrigation or sprinkler irrigation. The natural resources are limited and under pressure due to rapidly increasing demands by human beings. The policies are needed for optimum use, preservation and protection of natural resources for today and the future. Sustainability of natural resources for which continuity of systems and processes remain diverse and fertile indefinitely has a great impact on production economics. related to education and training, that is, inexperienced staff, insufficient laws, poor planning, lack of or improper allocation and usage of funds for water resources and networks, and insufficient attention given to operation, maintenance and repair. A doubling in global food demand poses huge challenges for agricultural sustainability in terms of food production.

Keywords: *Micro -irrigation, Surface irrigation, pipes, emitters, tubing, water, soil.*

INTRODUCTION

Agriculture is the most and largest components India's economic structure. Nearly third fourth of the Indians depend s on agriculture and it contributes much towards India's economic developments. It is also true to say that agricultural developments contribute towards industrialization of the nation. **Drip irrigation** provides slow, even application of low-pressure water to soil and plants using plastic tubing placed in or near the plants' root zone. It is an alternative to sprinkler or furrow methods of irrigating crops. **Drip irrigation** can be used for crops with high or low water demands.

Need for the study

Drip irrigation is used in farms, commercial greenhouses, and residential gardens. Drip irrigation is adopted extensively in areas of acute water scarcity and especially for crops and trees

such as coconuts, containerized landscape trees, grapes, bananas, be eggplant, citrus, strawberries, sugarcane, cotton, maize, and tomatoes. Drip irrigation for garden available in drip kits are increasingly popular for the homeowner and consist of a timer, hose and emitter. Hoses that are 4 mm in diameter are used to irrigate flower pots.

Evaluation of the study

The natural resources are limited and under pressure due to rapidly increasing demands by human beings. The policies are needed for optimum use, preservation and protection of natural resources for today and the future. Sustainability of natural resources for which continuity of systems and processes remain diverse and fertile indefinitely has a great impact on production economics. related to education and training, that is, inexperienced staff, insufficient laws, poor planning, lack of or improper allocation and usage of funds for water resources and networks, and insufficient attention given to operation, maintenance and repair. A doubling in global food demand poses huge challenges for agricultural sustainability in terms of food production.

Limitations

- The accuracy of the information depends up on the respondents.
- The study is mainly based on the information given by the sample farmers.

METHODOLOGY

Methodology is the way to solve the research problems systematically. It may be understood as a science of studying how researcher has selected a particular place randomly for survey. By following the convenient sampling method, the researcher has selected sample of 150 farmers in Erode District, Tamil Nadu.

INCLUSION CRITERIA

- The study is restricted to Erode District coverage area only, so it may not be universally applicable.
- Due to the shortage of time & other constraints, the study has been limited to 150 respondents only.

DATA ANALYSIS AND INTERPRETATION

To study the "farmers" satisfaction towards Drip Irrigation system a sample of 150 farmers has been selected and their opinions about the various aspects are obtained. The data collected from the farmers were systematically applied and presented as tables under various headings in the following pages. They were also arranged in such way that detailed analysis can be made as to present suitable interpretation for the same.

Table 1
Demographic variables

S. No	Demographic variables	N	%
1	**Age in years**	28	19
	a)Below 30 years		
	b)31-35 years	34	22
	c)36-40 years	51	34
	d)Above 41 years	37	25
2	**Education Qualification**	42	28
	a)Illiterate		
	b) School Level	58	39
	c) Degree Level	26	17
	d) Professional level	24	16
3	**Number of members in the Family**	12	08
	a)Up t**o** 2 members		
	b) 3 members	46	31
	c) 4 members	52	35

	d) Above 4 members	40	26
4	**Number of Family members employed in agriculture**	71	47
	a)Up t**o** 2 members		
	b) 3 members	37	25
	c) 4 members	22	15
	d) Above 4 members	20	13
5	**Type of family**	57	38
	a) Nuclear		
	b)Joint	93	62
6	**Farmers usage period of drip irrigation in cultivation**	40	27
	a)2 years		
	b) 2-3 years	50	33
	c) 3-4 years	29	19
	d) Above 4 years	31	21

Sources: Primary Data

The above table shows that out of the total farmers, 34% of the farmers are coming under the age group of 36-40 years, 25% of the farmers belongs to the age group above 41 years, 22% of the farmers are coming under the age group between 31-35 years and remaining 19% of the farmers are coming under the age group of below 30 years.

The above table shows that out of the table farmers, 39% of the farmers are having school level,28% of the farmers are illiterate, 17% of the farmers are degree level and remaining, 16% of the farmers are professional level.

The above table shows that out of the total farmers,35% of the farmers have 4 members, 31% of the farmers have 3 members,26% of the farmers have above 4 members and remaining 8% of the farmers are having up to 2 members in their family.

The above table shows that out of the total farmers, 62% of the farmers belong to Joint family and remaining 38% of the farmers belongs to Nuclear family.

The above table shows that out of the total farmers, 33% of the farmers are using Drip Irrigation between 2-3 years, 27% of the farmers are using Drip Irrigation between 2 years, 21% of the farmers are using above 4 years and remaining 19% of the farmers are using 3-4 years.

Table 2
Number of Acres are Holding the Farmers

S. No	Holding Acres Of Land	No. of Farmers	Percentage (%)
1	Below 5 acres	45	30
2	5-10 acres	63	42
3	Above 10 acres	42	28
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers,42% of the farmers are holding 5- 10 acres, 30% of the farmers are holding below 5 acres, and remaining 28% of the farmers are holding above 10 acres.

Table 3
Number of acres where land is cultivated using drip irrigation system

S. No	Drip using Acres	No. of Farmers	Percentage (%)
1	Below 2 acres	29	19
2	2 -4 acres	40	27
3	4 -6 acres	50	33
4	Above 6 acres	31	21
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers,33% of the total farmers cultivate land at 4 -6 acres, 27% of the farmers cultivate land in 2 – 4 acres,21% of the farmers are cultivate land in above 6 acres and remaining 19% of the farmers are cultivate in land below 2 acres.

Table 4

Type of crop cultivation in drip irrigation system

S. No	Crop Cultivation System	No. of Farmers	Percentage (%)
1	Coconut	80	53
2	Banana	20	14
3	Turmeric	17	11
4	Others	33	22
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers, 53% of the farmers' crop cultivation Drip Irrigation System in coconut, 22% of the farmers' crop cultivation in Drip Irrigation System in others, 14% of the farmers' crop cultivation in banana and remaining 11% of the farmers' crop cultivation in Drip Irrigation in turmeric.

Table 5

Type of setting in drip irrigation system

S. No	Setting Drip System	No. of Farmers	Percentage (%)
1	Open well	63	42
2	Bore well	45	30
3	Tank System	42	28
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers, 42% of the farmers set Drip Irrigation System in open well,30% of the farmers set in Drip Irrigation System in bore well and remaining 28% of the farmers set Drip Irrigation in tank system.

Table 6

Knowing the drip irrigation system

S. No	Knowing Drip System	No. of Farmers	Percentage (%)
1	Dealers	41	27
2	Neighbour Farmers	59	39
3	Horticultural Department	28	19
4	Advertisement	22	15
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers, 39% of the farmers known through Neighbour Farmers, 27% of the farmers known through Dealers, 19% of the farmers known through Horticultural Department and remaining 15% of the farmers known through advertisement.

Table 7

Most suitable method of low cost and low risk in drip irrigation cultivation

S. No	Suitable Method in Drip	No. of Farmers	Percentage (%)
1	Open well	96	64
2	Bore well	45	30
3	Tank System	09	06
	Total	**150**	**100**

Sources: Primary Data

The above table shows that out of the total farmers, 64% of the farmers felt that suitable method is Open well. 30% of the farmers' opinion Bore well and remaining 6% of the farmers felt that the most suitable method of low cost and low risk in Drip Irrigation cultivation in Open well.

Table 8

Mode of getting the drip irrigation instruments

S. No	Getting The Instruments	No. of Farmers	Percentage (%)
1	Company	30	20
2	Dealers	80	53
3	Agents	40	27
	Total	150	100

Sources: Primary Data

The above table shows that out of the total farmers, 53% of the farmers get the drip irrigation instruments through dealers, 27% of the farmers get the drip irrigation instruments from agents and remaining 20% of the farmers get drip irrigation instruments from the company.

Table 9

Yield of drip irrigation system

S. No	Yield of Drip Irrigation	No. of Farmers	Percentage (%)
1	High yield	75	50
2	Low yield	27	18
3	Normal yield	48	32
	Total	150	100

Sources: Primary Data

The above table shows that out of the table farmers, 50% of the farmers are receiving high yield from drip irrigation, 32% of the farmers are receiving normal yield and receiving 18% of the farmers are receiving low yield of drip irrigation system.

Weighted Score Ranking Analysis

Table 10

Problems faced by the farmers

S. No	Factors	Scores	Rank
1	High Initial Investment	210	VI
2	Damage due to climate conditions	212	V
3	High maintenance charges	227	III
4	Formalities in obtaining loan for Drip Irrigation	229	II
5	Power problems	262	I
6	Germination problems	225	IV

Sources: Primary Data

The above table shows that "Power problems" occupies the First place with the score of 262 points, "Formalities in obtaining loan for Drip Irrigation" has been ranked as Second place with the score of 229 points, "High maintenance charges" has been ranked as Third place with the score of 227 points, "Germination problems" has been ranked as Fourth place with the score of 225points, "Damage due to climate conditions" has been ranked as Fifth place with the score of 212 points, " High Initial Investment" has been ranked as Sixth place with the score of 210points,

CONCLUSIONS

The following conclusions are drawn from the study

- The study was conducted to analyze the Farmers Awareness and satisfaction towards Drip Irrigation in cultivation.
- Water is very important for all type of cultivation. Water savings are very important.

- The government should encourage the water savings. So the farmers can use the water properly and get maximum yield.
- The minor drawbacks of Drip Irrigation in cultivation are power problems, formalities in obtaining loan for Drip Irrigation etc.,
- The concerned authorities reduce the above problems faced by the farmers.

IMPLICATIONS

Estimates from the World Bank predict population growth to require global agricultural production to double in the next 30 years. This means that the world needs to grow more crops with less water. According to UNESCO, there is a strong, positive correlation between investment in irrigation technology, poverty alleviation and food security. Efficient irrigation is key to cultivating more crops to feed the world's undernourished. Agricultural water usage can be cut by at least 50 percent with proper irrigation systems. One of the most widely-recognized ways of dealing with this problem is drip irrigation, which has been primarily developed by Israel. Drip irrigation allows a controlled amount of water to slowly flow through tubes to the base of a plant through small emitters or pores in the tubes.

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A COMPARATIVE STUDY ON ICT ATTAINMENT AMONG THE GOVERNMENT AND NON-GOVERNMENT HIGHER SECONDARY SCHOOL STUDENTS

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Abstract

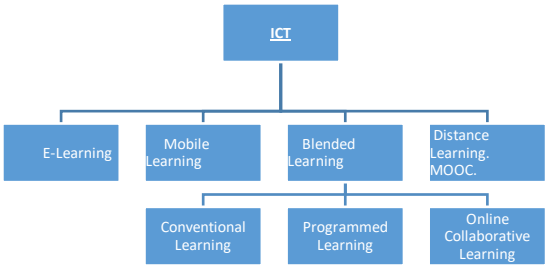
*ICT is an acronymic formof Information and Communication Technology. Teacher Education& students' capacity can be achieved easily by using techniques, teaching aids,like ICT components.**ICTs: Computers, internet, mobiles, etc.Those are can be called as audio-visual media and these are very important in teaching learning process.**The objectives are framed to compare the ICT resources available at schools among the govt. and non-govt. higher secondary school students & to compare the ICT Usage at schools among the govt. and non-govt. higher secondary school students and to compare the access of ICT activities collectively among the govt. and non-govt. higher secondary school students. There is survey method used to collect data by using self-made Questionnaires tool (total 55 questions). There are total 250 samples are used from govt. (125) and non-govt. (125) higher sec. school students of class XI from 14 schools in Bilaspur district, Chhattisgarh.The data analyses for this study utilized Microsoft Excel & t- Test was used to find the response to the questionnaire. Findings: There is more ICT resources are available in non-govt. schools than the higher secondary govt. schools. From the above discussion, the researcher concluded that there are less computer, internet, projector available in the govt. higher secondary schools than non-govt. higher secondary schools.Implications: By envisaging the provision for computer education (ICT) in the government schools as well as non- government schools in students' curriculum to improve quality.This paper suggested that a study can be conducted considering various aspects of Computer subject teachers e.g., training, courses etc programmes.*

Keywords: *ICT, ICT accessibility in Govt. & Non-govt. School Students, Comparative assessment, Implications, Suggestions for improving quality.*

INTRODUCTION

Education itself is the basic human right & as a tool to make a sensitive about issues & problems in our lives. It is considered to be the backbone of national ideals. Education is the most powerful instrument for changing in developing and developed countries. It provides a better quality of life for any citizen for their living environment. The purpose of Education is not only to train

people for employment & train them to competent their lives for present & future...so called preparation for future life. Teacher Education& students' capacity can be achieved easily by using techniques, teaching aids, like ICT components. **ICTs: Computers, internet, mobiles, etc.** ICT is an acronymic form of Information and Communication Technology. ICT refers to forms of technologies that are used to create, store, share or transmit, exchange information (UNESCO, 2002). The overall purpose of this study was to compare the accessibility of ICT based instructions by secondary school students in govt. and non-govt. of Bilaspur district in Chhattisgarh. This paper suggested that a study can be conducted considering various aspects of Computer subject teachers e.g., training, courses etc programmes. The advantages of ICTs are-



- Increase retention,
- Self Pacing of Learning and Serve multiple teaching functions,
- Capture expert knowledge and Multiplicity of Languages.

Rationales

Computer Education has become a compulsory subject in Teacher Education and both teachers and students started using computers in educational process. The rapid diffusion of Information And Communication Technologies(ICT) during the last two decades has had effective impact on all the area of human efforts. ICTs are seen as having a great potential for improving the human condition by creating new economic and educational opportunities. During the use of computers in education at the time of learning, it is observed that both from the context of facilities, awareness, skills, applications and evaluation the students always felt sensitive in integrating the computer education. Hence researcher felt that to know the access of ICT of students on educational purposes, which is taken as for the study.

Reviews of Related Literature

The scope of knowledge is very vast and progressive. Before undertaking a new research we must have knowledge of the related studies. In order to achieve this, it is very important to study and analyses the previous researches. It gives an idea of how much work has been done on a problem which the research had undertaken, the methodology adopted and the findings of the previous researches. A review of related literature also reduces the chances of a repetitive study. It helps to propose an outline and provides the guidelines to carry out the study.

Suryawanshia and Nakhede (2015) conducted a study on "Green ICT for sustainable development: A Higher Education Perspective" that evolution of Green ICT(GICT) and discusses the barriers in implementation of GICT at higher education institutions based on survey concluded in INDIA.

- An expensive literature review pertaining to GICT and sustainable development was carried out and 10 barriers were summarized using SPSS tool and Wilcox on Test the most important barrier for successful implementation of GICT at H. Education has been discovered.

Buadeng, Andoh, Y.Issifu(2014) conducted a study on 'Implementation of ICT in Learning: A study of students in Ghanaian secondary schools' that to

investigate secondary school students' use of ICT and the factors that relate to their technology use. A total of 3380 students from 24 public and private schools from four regions in Ghana participated in this study.

- This study found that majority of the students used ICT to communicate with peers more than other types of ICT application. However, the study found that students' pedagogical use of ICT was low. This analysis showed-student in public schools pedagogically uses ICT more than private schools. Total 3380 respondents, 51.5%females & 48.5% males. In addition, urban school students pedagogically use ICT more than semi-urban and rural school students. Finally, the findings indicated that students' ICT competencies were the most predictor of their technology use.

→ Duta, Martinez and Rivera (2014) conducted on 'between theory and Practice: the importance of ICT in higher Education as a tool for collaborative learning' that the importance of ICT in classroom by using virtual platforms (Blogs, Twitter, Trello, E-mail, Discussion forums). They used descriptive case method &collected data from 90 undergraduate students in each group aged between 18 and 28 years in university in Romania.

- Their findings indicated as below→

a. Tool for communication& interaction→ 91%, 82 respondents.
b. Improves learning→87.7%, 79 respondents;
c. Facilitates the autonomous& independent learning→80%,72 respondents ;
d. Assume different roles (taste, hobby, interest)→75%,68 respondents ;
e. Fosters knowledge of the contents of the field→63.35, 57 respondents;
f. Increased motivation→58%,52 respondents ;
g. Follow-up→46%,41 respondents ;
h. Achievement of the time→43%,39 respondents ;
i. Innovation& integration→39%,35 respondents ;
j. Developing skills in finding the information→34%,31 respondents ;
k. Creativity→31%,28 respondents ;

- Other answers→ here those responses that could not be integrated into any of the above categories. They proved that the use of ICT influences the students' achievement at top level.

Knowledge Gap

After reviews, the researcher got there is no detail activity (research) among the govt. And non-govt. higher secondary school students in State and CBSE secondary schools in Bilaspur district were found. So that is a knowledge gap, which is seemed to me.

Research Question (?)

After studying the related reviews on use of ICT, a question arises in researcher's mind, is there any comparison between the accesses of ICT among the govt. And non-govt. higher secondary school students in State and CBSE secondary schools in Bilaspur district?.....

Statement of the Problem

Considering the importance of ICT in teaching learning process the present study is based on what is the condition of accessing ICT govt. & non-govt secondary school students in today's scenario. The present study focused on "**A Comparative Study on ICT Attainment among the Government and Non-Government Higher Secondary School Students".**

Objectives of the Study

1. To compare the ICT resources available at schools among govt. and non-govt. higher secondary school students'.

2. To compare the ICT Usages at schools among the govt. and non-govt. higher secondary school students.
3. To compare the access of ICT activities collectively among the govt. and non-govt. higher secondary school students.

Hypotheses

To test the attainability of the above objectives (2, 3,) the following hypotheses are formulated.

A. Research Hypotheses(R_H):-

R_H 1: There is a difference between the ICT Usage at schools among the govt. and non-govt. higher secondary school students.

R_H 2: There is a difference between the **access of ICT activities collectively among the** govt. and non-govt. higher secondary school students.

B. Null Hypotheses(H0):-

$H_0$1: There is a no significant difference between the ICT Usage at schools among the govt. and non-govt. higher secondary school students.

$H_0$2: There is a no significant difference between the **access of ICT activities collectively among the** govt. and non-govt. higher secondary school students.

Variables

a. Independent: Higher secondary schools (govt. and non govt.).
b. dependent: The ICT accessibility of students.

Research Process

According to objectives, survey method was adopted for the study.

Survey method: Survey method is used to obtain descriptive information about target population.

Population: All higher Secondary School Students of Class 11th (Arts, Science, & Commerce) who were learning with secondary schools those are situated in Bilaspur District.

Samples: 250 Students (125from govt. and 125 from non-govt.) were selected for the study from 14 schools of Bilha block of Bilaspur District of Chhattisgarh state, by using simple random sampling method. Detailed of sampling provide in Appendix No.I.

Appendix-i

Description of samples

Management	School Name	Sample Size
Govt. Schools	A. Govt. HS School, Koni B. C.G HS School,Birkona C. Govt.HSSchool, Tarbahar D. Dr.B.R.Ambedkar N.N School,Magarpara E. Govt. HS School,Chantidih F. Mission HS School,Brihaspati Bazar G. C.G HS School,Police Ground.	125(Students, Class-11th)
Non-Govt. Schools	H. Modern Educational Academy, SeepatChak, I. Burgess EM H School,Police Line, J. Real Growth P.School,Uslapur K. St.Joseph Convent HS School,Tarbahar L. Hari Model School,Bilaspur M. SaraswatiS.Mandir HS ,Koni N. Mohanty E.M HS School,Bilaspur.	125(Students, Class-11th)
Total Schools	**14**	**250**

Research Tools

The instruments that are employed to gather new facts or to explore new fields are called as 'Tools'. It is has vital

importance to collect suitable and desired data. Different tools are suitable for selecting different types of data. Since the present study is related to the collection of information from the Students regarding the use of ICT in Learning Process in higher Secondary Schools. A 'Questionnaire' was constructed by researcher and administered to find out the desired objectives.

Also Checklist (Yes/No) type and Observation Schedule are included in the Questionnaire Tool. Microsoft Excel is used for data calculation.

Data Analysis

Here t-test is used to find out the statistical significance.

From objective 1: The researcher got that this objective is studied under the qualitative analysis of data for each question. From the survey it is noticed that at minimum one computer available in every school. There are 3 schools (2 govt. and 1 non- govt.) have at least 1 projector only among 14 schools. There are 4 schools (2 govt. and 2 non-govt.) have internet facility only. There are 13 schools have Computer labs except 1 govt. school and also 1 non-govt. school has virtual learning platform among 14 schools.

From the above discussion, the Researcher concluded that there are fewer computers, C.D. Cassette, internet, projector available in the govt. higher secondary schools than non-govt. higher secondary schools.

From objective 2:

Table-1.1

t-Test :Two-sample assuming equal variances.

Description	Variable1(Govt.)	Variable 2 (Non-govt.)
Mean	12.928	21.64
Variance	14.486	41.861
Observations	125	125
Pooled Variances	28.174	
Hypothesized Mean Difference	0	
df	248	
t-Stat	12.975	
P(T<=t) One-tail	4.94041E-30	
T critical one-tail	1.651	
P(T<=t) two-tail	9.88082E-30	
T critical two tail	1.969	

Fig: t-Test.

From objective 2, researcher got that here in table no, 1.1, df 248 and the significance level 0.05,"t" calculated value is 12.975.

This is greater than "t"-table value which is 1.969.

So this indicates that our formulated Null Hypothesis ($H_0$1) is rejected and alternate hypothesis (Research hypothesis) is accepted at df 248 and Significance level 0.05.

Hence, can draw the interpretation as- There is a significant difference between ICT usage at schools of the govt. and non-govt. higher secondary school students.

From objective 3:

Table 1.2:

t-test: Two-sample assuming equal variances

Description	*TOTAL=Government*	*TOTAL=Non-govt.*
Mean	61.296	95.472
Variance	293.5649032	391.0092903
Observations	125	125
Pooled Variance	342.2870968	
Hypothesized Mean Difference	0	
df	248	
t Stat	14.60380333	
P(T<=t) one-tail	1.41318E-35	
t Critical one-tail	1.651021014	
P(T<=t) two-tail	2.82637E-35	
t Critical two-tail	1.969575598	

From objective 3, researcher got that here in table no, 1.2, df 248 and the significance level 0.05,"t" calculated value is 14.603 .

This is greater than "t"-table value which is 1.969 .

So this indicates that our formulated Null Hypothesis ($H_0$5) is rejected and alternate hypothesis (Research hypothesis, R_H 5) is accepted at df 248 and Significance level 0.05.

Hence, can draw the interpretation as- There is a significant difference between the govt. and non-govt. secondary school students with reference to the ICT Activities.

Findings

Findings.1: There is more ICT resources are available in non-govt. schools than the higher secondary govt. schools.

Findings.2: It can be concluded that the students of non-govt. schools had a better level of ICT usages than the students of govt. schools.

Findings.3: In this objective research, explore that there is a significant difference between **the access of ICT activities collectively among the** govt. and non-govt. higher secondary school students. For this study researcher used t-test to analyse the significance level of compare **the access of ICT activities collectively among the** govt. and non-govt. secondary school students.

It can be concluded that the students of non-govt. schools had a better level of **the access of ICT activities collectively**than the students of govt. schools.

Delimitations

The study was limited to Bilha block of Bilaspur district of Chhattisgarh state in India.

The study was limited to some Rural and some urban schools only.

The study was limited to Class-11th only.

CONCLUSION

From the above discussion, the Researcher concluded that there are less computer, internet, projector available in the govt. higher secondary schools than non-govt. higher secondary schools.

It can be concluded that the students of non-govt. schools had a better level of ICT usages than the students of govt. schools.

There is more ICT resources are available in non-govt. schools than the higher secondary govt. schools.

- **Needs of the Study:** ICT are seen as having a great potential for improving the human condition by creating new economic and educational opportunities, so this study is important for modern situation in the world.

Implications

a) By envisaging the provision for computer education in the government schools as well as non- government schools in students' curriculum.

b) To develop students' competencies to solve daily problems by using ICTs.

c) To increase the computer literacy (CLASS project) in rural area students as well as urban area in the higher secondary level.

Suggestions for Further Study

Based on the findings of the study, series of recommendations were formulated. First, this study should be replicated and a similar study should be conducted using additional board in India. Further study in Chhattisgarh is required to determine and evaluate barriers, incentives and attitudes of students that could affect the implementation of ICT in the government and non-government higher secondary schools.

A study can be conducted at different college & university levels.

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USER SATISFACTION WITH FACILITIES AND SERVICES IN DEGREE COLLEGE LIBRARIES IN WARANGAL DISTRICT, A USER STUDY

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Abstract

This article presents information on various ICT facilities and services provided in Its Aided Degree College Libraries of Warangal district Telangana State, Any library can be successful if its users are satisfied with the facilities provided and if they are in the interests of its users, current status of institutions providing library services such as traditional, and document delivery services and facilities like hardware, software and communication resources. User awareness is essential to make aware about various study resources available in library and help to increase the utilization of library. The analysis of the collected data covers the use of library resources, classification and catalogue, library services and physical facilities.

Keywords: *Facilities, Degree College Libraries, Academic Libraries, , Library Users.*

Introduction

"Higher education is considered to be a significant instrument for the development of any country, particularly for a developing country like India.[1] In India, higher education system provides access to a larger number of people so that a knowledge-based society could be built. Degree colleges require to provide high quality facilities and services from all the departments to retain and attract the students. Library facility should therefore start with analysis of the factors of library facilities which lead to user's satisfaction. The purpose of this paper was to know the user's satisfaction with the facilities available in Degree Colleges in Warangal District

Definition of Academic Library

Academic library is a library that is joined to an academic institution over the secondary level, serving the instructing and research needs of students and staff. These libraries fill two integral needs: to help the school educational plan, and to help the exploration of the school staff and students. The help of educating requires data assets for class readings and

for understudies. Before, the data assets for class readings, planned to enhance addresses as endorsed by the teacher, has been called holds. As per Fabunmi (2002)[2] "Scholarly libraries are operationally characterized as composed assortments of data assets (print and non-print) which structure a necessary piece of tertiary establishment."

Facilities:

According to Illustrated Oxford dictionary facility is "an opportunity, the equipment or the resources for doing something.

Degree College Libraries: Status

The library is acclaimed as the 'imperative wellspring of information', the focal point of scholarly life and the central core of the any academic foundation. Unmistakably numerous revelations and advancements are really made in the library as an information center point and likewise tried in a research facility. It possesses a significant spot in modern education system and keeps up the costly instructive assets of the academic foundations. It is take action of the library experts to give reasonable data to any client whenever in order to spare his valuable time. The librarians are for the most part liable for the determination and assortment of material reasonable for libraries[3]. Libraries are focal point of learning and assume a significant job in supporting and satisfying the data necessities of parent foundations. For building up the productive, successful and logical advancement of data assets and administrations, the libraries should be structured and grew methodically.

Academic libraries as collecting information resources should focus on things highly required information needs of the users which are hardly possible for a single library in the present era of information. Librarians scrutinize the needs of students and instructors, as well as the main concern of the college or university when deciding what to focus on. Academic libraries provide needed information of the users through available facilities and services.

Objectives of Degree College Libraries

Degree college library plays an important role for ensuring the success of higher degree. The principal activities of degree college libraries comprise the circulation, collection, development, access to electronic information resources, reference service, user education, etc. Libraries of degree colleges are expected to provide effective and trust worthy information using the latest information technology tools. The basic reason of the libraries of Degree College is to be an energetic tool for explaining the expanding possibility of knowledge. The library ventures to get together the consistent needs and demands of the users, from the senior academics engaged in advance research to the fresh entrant and stimulates the students and faculty to develop lifelong good reading habits[4]. It is becomes a source of centre of educational and scholarly pursuit for the students of Degree College. In fact, the degree college libraries have been established with the following

Objectives:

I. To find out if users are satisfied with the services offered in the library
II. To fulfil the basic needs of information to support teaching staff, graduates and study requirements of the users
III. To facilitate and promote access to the fast growing and expanding collection of resources of information.
IV. To circulate of this knowledge through teaching and learning purpose.
V. To expand the bounds of information through technical work by students, teachers and

lifelong learners.

VI. To help the students and the taught to achieve their degree and guide to higher education such as Post Graduation or employability.

A degree college library is a self-learning community for the greater part of the clients. It is a potential service-oriented college and, responsible for each part of exhibitions in the college. The definitive job of the library is to help instructing learning process in the present situation of training framework to which it is appended. It shouldn't be worked as a straightforward storage facility of books joined to an understanding room, however as a powerful gadget of education.

Academic libraries today change with respect to the degree to which they suit the individuals who are not subsidiary to their parent universities. Some offer reading and acquiring benefits to individuals from public in general on installment a yearly expense; such charges can change incredibly. The benefits so acquired ordinarily don't stretch out to such administrations as computer uses, other than to look through the list, or Internet get to. Then again, access to the libraries of certain universities is totally limited to students, faculty and staff. Indeed, even for this situation, they may make it feasible for others to obtain materials through between library loan porgrammes[5].

The library is to be played an important role in the process of Education. Generations together the wisdom distilled their after mind of human beings evolved. Libraries play an important role from the ages in higher education in India. The activity of reading sharpens the minds of human beings and clarifies the concepts of study.

Functions of the Degree College Library

I. To approve latest technology, e.g. automation in certain areas saves the time and minimizes the possible time of the user by providing purposeful service.

II. To achieve, process, systematize and make obtainable varied types of reading materials for meeting the needs of different levels of user

III. To orient the students and offer them the resources useful for improvement of technical projects

IV. To maintain the faculty members well-versed of the most recent amount of resources in their fields of specialization

V. To arrange an information centre in library and provide reader suggested services as to enable them to utilize the library resources.

VI. To achieve the proper funding policy authorities should be informed

The achievements and attainments of literary output of the institute.

Automation process has changed the information dealing with exercises in the libraries of undergraduate colleges from the ongoing past[6]. The information society includes the significant advances that have involved data handling, and recovery to be consolidated in order to develop a coordinated framework which is fit for giving administrations uniquely. Toward this path, the automation of individual degree college libraries is an initial step rather a pre-essential for the improvement of such an exhaustive under graduate library and data framework. The float in the improvement of data administrations with productive systems administration of these libraries will encourage the most ideal use of data assets.

Resources in Degree College Libraries

The resources in any degree college library can be extensively assembled into two configurations for example print and electronic resources. The most helpful data assets in degree college libraries are print structure books, printed versions of magazines and diaries, back volumes of periodicals, reference books, gazetteers, past question papers, reports, word references, chart books and maps, indexes, venture reports, news papers, bulletins, and so forth.

For various reasons, under graduate college libraries are getting to and buying in print and electronic diaries and books. Coming of data and correspondence innovation particularly in web, the curators could think for electronic assets to fulfill the necessities of library benefactors. Presently the idea of information arrangement to users is moved from data accessibility to data access and dispersal to the users with nonstop assistance with before client work area. In this way, there is no alternative left to library experts with the exception of going for electronic assets. The electronic assets have an assortment of preferences which incited the library experts to fuse them in library assortments. Coming up next are the a portion of the assets in electronic configuration; E-Magazines, E- Audios, E-Databases, NPTEL Materials, E-News, E-Images, E-Books, E-Lectures, E-Journals, E-Subject Guides, E-Newsletter, E-Conference Proceedings, E-Reports, NLIST Journals and Books, E-Shodhsindhu, DELENT, DOAJ, DOAB, free online journals & books, National Digital Library and E-Directories.

Dr. S. Radhakrishnan, the Chairman of the University Education Commission (1948-49) says that teachers must have the vital devices for showing reason in the state of libraries and research centers for the correct kind of understudies. He likewise gave great articulation i.e., "The library is the core of the University's work or education institution, and furthermore as respects its examination work and in a roundabout way as respects its instructive work, which gets its life from inquire about work. Specialists and employees need a library just as its labs, while for humanistic research. The preparation in advanced education establishments for example degree college libraries of learning and research is mostly an issue of figuring out how to utilize the instruments, and if the library devices are not there, by what means can the understudies figure out how to utilize them"[7].

"Library Committee of University Grants Commission in 1957 headed by Dr. S. R. Ranganathan that dealt with in detail the role of the university library in academic development especially in the field of higher education India. The above observations can be summarizing in the words as

I. The library is the core of education institution.
II. Methods and design in education change from age to age, yet every age utilizes the library as a methods for understanding its things; consequently the library remains the incredible conservator of learning and research;
III. Quality education is impossible without a quality library and data focus
IV. A library is significant organ for appropriate misuse of our scholarly assets
V. A library is fundamental for upkeep of free access to any one[8]

Information communication technology:

It is characterized as, "Data and Communication Technology, is the innovation required for data handling according to the most recent needs. Specifically in the utilization of electronic computer and computer software to

change over, store, secure, process, transmit and recover data from anyplace, whenever round the clock[9] It comprises of innovation, for example, radio and the more current computerized advances like computer, satellite, cell phones and the web. Additionally it includes the Electronic assortment, altering, stockpiling, conveyance and introduction of data.

Role of ICT in College Libraries: Information explosion and the developing ICT revolution has altered the advanced education set-up particularly college libraries to as far as possible. Usage of most recent innovation and computerization programming projects in library exercises has changed the conventional housekeeping tasks of the academic libraries. Libraries are now automated for example all the housekeeping activities are currently performed by utilizing with Information and Communication Technology. This technology is used in degree college libraries and data communities for the advancement of new information giving recovery administrations and computerization of library benefits in Degree College libraries. ICT is helpful in incredible broaden. It is valuable for improving proficiency of library benefits adequately in academic libraries. It gives the quality data and furthermore spares the space of the library and spare the hour of its college library supporters.

Facilities of degree college libraries:

Various facilities such as Reading Room, Book Bank Facility, Competitive Exam cell Book Exhibitions, Book Review Club, Earn While Learn, Reprography, Scanning, Softcopy of Syllabus, Question Bank, Open Access System, OPAC, Internet facility Library Website, Digital Information centre, Online Library Newsletter, Institutional repository are available in degree colleges based on their exposure.

Services of Degree college libraries

Different services are being offered by the librarians for example, computerized issues return, reference service, referral service, news section service, indexing Service, access to open access resources, current awareness service, selective dissemination of information service, specific spread of data administration, bibliographic assistance, documentation service, user orientation /user education and so on ..

Innovative Services

In the present scenario library users are competent with the modern technology in the education institutions. They are mostly depending upon ICT based needs. As per the needs of the users in college libraries have to start innovative services such as Facebook, Whatsup, Telegram, library websites, library portals, Blogs etc. for share the latest information. And also Computerized Library Services, OPAC (Online Public Access Catalogue), Library Membership, Library Website and E-Mail, Library User Group, Institutional Membership, Book Exhibition and Lecture Series, Library Orientation Program, Internet and e-resource centre, Book Bank Scheme, Reference and Referral Service, Display of New Arrivals, Book Discount Scheme , Inter-Library Loan, Digitized News - Paper –Clipping Service, Dissertations, Thesis and Reports, E- Journals & E-Books under Inflibnet N-LIST programe and competitive cell various innovative services are providing to library users in degree colleges

Table 1
User opinion about books lending service in degree college libraries

Response	Departments									Total
	GDC			ADC			PDC			
	B. Sc	B.Com	BA	B. Sc	B.Com	BA	B. Sc	B.Com	BA	
Very satisfied	45 (3.65)	54 (4.38)	84 (6.81)	46 (3.73)	49 (3.97)	49 (3.97)	49 (3.97)	54 (4.38)	54 (4.38)	**484 (39.22)**
Satisfied	28 (2.27)	29 (2.35)	34 (2.76)	17 (1.38)	34 (2.76)	34 (2.76)	26 (2.11)	29 (2.35)	32 (2.59)	**263 (21.31)**
Neutral	16 (1.30)	23 (1.86)	25 (2.03)	26 (2.11)	25 (2.03)	27 (2.19)	21 (1.70)	18 (1.46)	28 (2.27)	**209 (16.94)**
Dissatisfied	28 (2.27)	21 (1.70)	18 (1.46)	26 (2.11)	13 (1.05)	16 (1.30)	16 (1.30)	11 (0.89)	21 (1.70)	**170 (13.78)**
Very dissatisfied	10 (0.81)	18 (1.46)	16 (1.30)	10 (0.81)	13 (1.05)	15 (1.22)	7 (0.57)	9 (0.73)	10 (0.81)	**108 (8.75)**
Total	**127 (10.29)**	**145 (11.75)**	**177 (14.34)**	**125 (10.13)**	**134 (10.86)**	**141 (11.43)**	**119 (9.64)**	**121 (9.81)**	**145 (11.75)**	**1234 (100)**
Chi-Square: **38.683** Chi -square table value: **46.194** df : **32** Nature of Significant :**Not Significant**										

Table 1: indicates the user satisfaction with the lending services in the college libraries in Warangal. It is mentioned that the satisfaction level with the lending services was encouraging as 484(39.22%) felt very satisfied, 263(21.31%) felt satisfactory, 209(16.94%) were neutral, 170(13.78%) felt dissatisfactory, only 108(8.75%) students felt very dissatisfactory about books leading services.

On the whole, it is found that the satisfaction level among the users with the books leading services is very satisfactory and the degree college libraries need to find the ways and means of recovering the existing services and offer more services to the students.

Table 2:
User opinion about reference services in degree college libraries

Response	Departments									Total
	GDC			ADC			PDC			
	B. Sc	B.Com	BA	B. Sc	B.Com	BA	B. Sc	B.Com	BA	
Very satisfied	35 (2.84)	35 (2.84)	68 (5.51)	46 (3.73)	39 (3.16)	39 (3.16)	29 (2.35)	34 (2.76)	34 (2.76)	**359 (29.09)**
Satisfied	29 (2.35)	29 (2.35)	34 (2.76)	17 (1.38)	34 (2.76)	35 (2.84)	28 (2.27)	32 (2.59)	42 (3.40)	**280 (22.69)**
Neutral	26 (2.11)	33 (2.67)	29 (2.35)	26 (2.11)	25 (2.03)	29 (2.35)	24 (1.94)	28 (2.27)	29 (2.35)	**249 (20.18)**
Dissatisfied	25 (2.03)	31 (2.51)	27 (2.19)	26 (2.11)	26 (2.11)	21 (1.70)	29 (2.35)	18 (1.46)	24 (1.94)	**227 (18.40)**
Very dissatisfied	12 (0.97)	17 (1.38)	19 (1.54)	10 (0.81)	10 (0.81)	17 (1.38)	9 (0.73)	9 (0.73)	16 (1.30)	**119 (9.64)**

Total	**127 (10.29)**	**145 (11.75)**	**177 (14.34)**	**125 (10.13)**	**134 (10.86)**	**141 (11.43)**	**119 (9.64)**	**121 (9.81)**	**145 (11.75)**	**1234 (100)**
Chi-Square: **34.984** Chi -square table value: **46.194** df : **32** Nature of Significant : **Not Significant**										

Table 2: shows the analysis of the satisfaction with the use of reference services in the college libraries in Warangal. It is clearly shown that the approval level with the use of reference services was encouraging as 359(29.09%) students indicated that they were 'very satisfied'. However, 280(22.69%) students expressed that they were 'satisfied', whereas 249(20.18%) users were 'neutral', whereas 227(18.40%) students 'dissatisfied' and only 119(9.64%) students says 'very dissatisfied'.

In the PDCs, it is clearly shown that the contentment level with the use of reference services was encouraging as 102(8.27%) students indicated that they were 'satisfied'. However, 97(7.86%) students expressed that they were 'very satisfied', whereas 81(6.56%) users were 'neutral', whereas in as 71(5.75%) students 'dissatisfied' and only 34(2.76%) students says 'very dissatisfied'

Table 3

User opinion about Reprographic service

Response	**Departments**									**Total**
	GDC			**ADC**			**PDC**			
	B. Sc	**B.Com**	**BA**	**B. Sc**	**B.Com**	**BA**	**B. Sc**	**B.Com**	**BA**	
Very satisfied	12 (0.97)	19 (1.54)	19 (1.54)	10 (0.81)	10 (0.81)	17 (1.38)	9 (0.73)	9 (0.73)	16 (1.30)	**121 (9.81)**
Satisfied	25 (2.03)	33 (2.67)	27 (2.19)	26 (2.11)	26 (2.11)	21 (1.70)	29 (2.35)	18 (1.46)	24 (1.94)	**229 (18.56)**
Neutral	28 (2.27)	27 (2.19)	34 (2.76)	17 (1.38)	34 (2.76)	35 (2.84)	28 (2.27)	32 (2.59)	42 (3.40)	**277 (22.45)**
Dissatisfied	36 (2.92)	31 (2.51)	68 (5.51)	46 (3.73)	39 (3.16)	39 (3.16)	29 (2.35)	34 (2.76)	34 (2.76)	**356 (28.85)**
Very dissatisfied	26 (2.11)	35 (2.84)	29 (2.35)	26 (2.11)	25 (2.03)	29 (2.35)	24 (1.94)	28 (2.35)	29 (2.35)	**251 (20.34)**
Total	**127 (10.29)**	**145 (11.75)**	**177 (14.34)**	**125(10.13)**	**134 (10.86)**	**141 (11.43)**	**119 (9.64)**	**121 (9.81)**	**145(11.75)**	**1234 (100)**
Chi-Square: **39.789** Chi -square table value: **46.194** df : **32** Nature of Significant : **Not Significant**										

Table 3: show the study of data on the satisfaction level of students with reprographic services. It is pointed out that nearly half of the students were dissatisfied with reprographic services as compared to those who were dissatisfied. Out of total users, 356(28.85%) were 'dissatisfied' whereas 251(20.34%) were 'very dissatisfied', 229(18.56%) were 'satisfied' and 227(22.45%) were 'neutral', only 121(9.81%) were 'very satisfied' with the reprographic services in the degree college libraries.

Further, to find out whether there was a very important difference, the calculated $\chi 2$ value is 39.789, which is lower than the $\chi 2$ table value 46.194 at 32 degrees of freedom as its significance at 0.05 levels. Therefore, it can also be easily concluded that there is no very

important difference among respondents as per their type of colleges User opinion about reprographic service.

Conclusion

It is found that, **(Table 1)** User opinion about books lending service in degree college libraries It is observed that the satisfaction level with the lending services was encouraging as 484(39.22%) felt very satisfied, 263(21.31%) felt satisfactory,209(16.94%) were neutral, 170(13.78%) felt dissatisfactory, only 108(8.75%) students felt very dissatisfactory about books lending services

(Table 2) It is clear that majority colleges 55% (11) of college library users are facing lack of speed internet facility in their respective colleges. 60% of colleges are facing lack of furniture. **(Table 2)** 40% Out of total users, 356(28.85%) were 'dissatisfied' whereas 251(20.34%) were 'very dissatisfied', 229(18.56%) were 'satisfied' and 227(22.45%) were 'neutral', only 121(9.81%) were 'very satisfied' with the reprographic services in the degree college libraries. college libraries are having electricity fluctuation in their colleges. And also 50% of libraries users are raised they need orientation program for how to access the resources from the library**.** User opinion about reference services in degree college libraries All Aided Degree College libraries are providing book lending service, referral service and reference services. Colleges are providing extension service. All degree college libraries have internet facility for access the resources" It is observed that out of 13 Government, have internet facility a major percentage i.e.53.84%, Majority of college libraries are not getting the internet facility properly. So the authorities should receive indispensable steps to progress speedy internet facility to their libraries.

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ISLAM AND TASAWWUF: A STUDY OF SOME EARLY SUFI PERSONALITIES

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Abstract

Tasawwuf is one of the most important notions in the religion of Islam which continues among the Muslims today. It is that mode of the religious life in Islam which emphasizes on the activities relating to the inner-self. The history of Tasawwuf spans all of Islamic Arabic civilization, commencing with the Ahl al-Suffah who lived during the period of Prophet of Islamand ending with the emergence of several Sufi orders in modern times. Tasawwuf has been widely discussed by various scholars since its appearance on the screen of Muslim history. However, after the period of the four orthodox Caliphs, there was a drastic change in the Muslim community. There started political turmoil and civil wars among the Muslims which gave birth to various political and religious groups. A group of pious Muslims separated themselves from this political controversy and decided to devote their time to worship and other religious duties and remained in seclusion. These spiritual Muslims were, to all intents and purposes, none other than the Sufi Saints, whether they were then called by that name or not. Therefore, the aim of this paper is to describe a brief overview of the origin and significance of Tasawwuf in the early phase of the Islamic era and highlight the teachings of some early famous Sufi Masters of Islam who had exerted a great influence on the Muslim society particularly and how their spiritual teachings shaped the lifestyle of the people back then.

Keywords: *Tasawwuf, Inner-self, Ahl al-Suffa, Sufi Saints, Influence.*

Introduction

The derivation of the word *Sufi*, whether it is from *Ahl-al-Suffah,Safa,* or *Saff,* leads one to conclude that its origin is found in Islam. A Sufi refers to someone who lives his life according to the Qur'ān and Hadith. However, worldly rejection is not a feature of Islamic *Tasawwuf* as it has originated from faithless saints and is also known as self-created philosophy. *Tasawwuf* plays a significant role in the life of the Muslims. In fact, its practice through the implementation of the primary sources of Shari'āh is the genuine and authentic kind of spiritualism. Through this practice, Sufi-saints are trying to purify the inner self. A spiritual cleansing makes one to distinguish between good and evil, and therefore, man finds the right track to

tread himself towards the seeking of Allah's contemplation. This provides a clear-cut indication that possessing or acquiring positive spiritual qualities helps the moulding of man's character and attitude. This feature, undoubtedly, paves the way to engage himself in the process of fulfilling or accomplishing the Qur'ānic commandment of propagating goodness and preventing bad deeds. When he has understood the importance of this divine directive, the fear of Allah will automatically descend in his heart, thus moving him away from the sinful activities.

Regarding the origin of the word *Sufi*, scholars have given various opinions. Orientalistssay that the word *Sufi* originated from the word *Suf* which means *wool*. According to them, Sufi Saints used to wear woolen or rough garments due to which the term *Sufi*was used for them and also for its etymological similarity. On the other hand, some Muslim Scholars are of the opinion that the term *Sufi*came into existence from *Ashāb al-Suffa.*They were those who would spend time in Masjid-i-Nabawi and engage in spiritual activities for a particular period and not for all the times. Other Muslim scholars hold that the term *Sufi* emerged from *Saf* which means *first rank*. Here, they referred that the Sufi Saints were Muslims of first rank. Another group of scholars opine that it originated from the term *Safa* which means *purity*. They emphasised that cleansing the heart and mind is the main motive of the Sufi Saints and develop love for Allah and His Prophet Muhammad (ﷺ).

Early Development of *Tasawwuf*

In the primary sources of Islam (Qur'ān and Hadith) the word Sufi is not mentioned. Though, the main concept behind *Tasawwuf* to be found in them. In simple words, we can say that Allah commanded to the Muslims for the purification themselves from internal illness and sins in general; this is the main aim of *Tasawwuf*. But, it is to be taken into consideration that the word *Tasawwuf* basically emerged nearly two centuries after the establishment of Islam in the world.

When we are tracing the early history of *Tasawwuf*, we traced that it was originated in the eighth century. At that time most of the people were engaged in political and materialistic things. Then, the Muslim Sufi Saints, by not indulge in the political zone, made an effort to bring about a spiritual awakening and to spread human values. When acquisitiveness infected the hearts of, many Muslims, the Sufi saints looked with the call please go back to your Allah, purify yourself and go back to the truth of Islam (Development of Mystic Thought and Indian Sufis, by Dr. Abroo Aman Andrabi, Assistant Professor Department of Islamic Studies Jamia Hamdard, New Delhi).Sufi Saints advised the peoples that do not influence by materialistic things and said to come back towards the true Islam this is the only way to get nearness of Allah. Only for this reason *Tasawwuf* was established in order to eradicate the Western culture that had crippled the Muslim community.

Sufi Saints practice such spirituality which does not oppose to the Scripture (Qur'ān) and Prophetic Traditions (Hadith). Although, they elucidate some Qur'ānic verses and Ahadith in a different manner sometimes. The Sufi Saints discussed in deeply some verses which are related to the *Tasawwuf* and they add some meaning which is not accepted by other scholars. But all the Sufi Saints are agreed that the authenticity of *Tasawwuf* is the primary source of Islam (Qur'ān and Hadith). Especially *Tasawwuf* focused on spiritual attention. Because Sufi Saints believed that when a Muslim possesses good faith,it leads to the development of a good spiritual life thus shaping his character. His life will be functioning according to the Islamic rules and regulations.

Tasawwuf developed in the 8th and 9th centuries in three major centres are as follows:

1. Basra, Kufa and Baghdad (all these places are in Iraq).
2. Balkh (is a town in the *Balkh* Province of Afghanistan).
3. Egypt (a country linking northeast Africa with the Middle East, dates to the time of the pharaohs).

In the early phase of development, *Tasawwuf* said more nothing except the internal teachings of Islam. From the one viewpoint, they opine that the *Tasawwuf*is directly from the Qur'ān. Others grasp that it is the copy of the way of Prophet of Islam (ﷺ), through this the connection of heart is strong with Allah. Furthermore, *Tasawwuf* teaches one to get nearer to Allah, and this is to be accomplished through various stages. They are as follow:

1. Stage of Repentance.
2. Stage of Abstinence.
3. Stage of Patience.
4. Trust in Allah

These stages constitute the ethical and spiritual disciplines of *Tasawwuf*. It is important that the total pledge of a Sufi at each phase is energetic towards spiritual progress. The soul is also known as *Nafs* in the Arabic Language. *Tasawwuf* explained that the soul primarily is a demanding soul, which should be under control into a "contented soul", and later on "soul at peace". These features of the Soul are discussed thoroughly in the Holy Quran and many Sufi teachers and scholars are commented on it.

The initial teachings of *Tasawwuf* are based on the oneness of Allah *(Tauhīd)*.Believe of Sufi Saints that the initial creation of Allah is human's mind which gives sense to the human for acquiring knowledge and differentiates between the right and wrong, good and evil. In *Tasawwuf*, this knowledge raised up to the highest level, which arises in the heart rather than the mind. This is the simple knowledge that keeps away from a spiritual person from a philosopher. It makes eligible to experience spiritual phenomena and visions to the Sufi Saints.

The Early Sufi Saints

The Sufi Saints who belong to the early stage were spiritualists in the actual sense of the word and they lived their life as a penniless person and always keep ideal to poverty. They opine that the materialistic belongings and problems distracted someone from a concentrated religious life. Sufi Saints persuaded that the needed attention was possible only when someone was not greedy for material things. Some agreed with this and take it further, favouring the rejection not only of materialistic desires but of wish itself. Only after that, someone can actually devote himself to acquire the divine pleasure. Further, they explained that when complete dedication and devotion were required to attain materialistic success in this life on the earth, then achievement in the next (eternal life) without equal or even more devotion and dedication, was not possible.

Ibn Khaldun describes the way of the life of early Sufi Saints, he said- *Early Muslims thought that the way of life of Sufi Saints as the way of Truth and salvation.* The early Sufi Saints maintained piety and left all the belongings of materialistic charm for the sake of Allah; they rejected worldly pleasure, wealth and power, renounced the society and chose a spiritual life devoted to the nearness of Allah. These were the primary notions of *Tasawwuf* that spread among the companions (those who lived with Prophet of Islam ﷺ) and Muslims of the initial stage. Therefore, we find that the early time of *Tasawwuf* was a search of spirituality in actually.

We have many Ahadith that depict the companions of the Prophet (ﷺ) and the Tabi'un that how they lived their life in the respect and fear of Allah. One of the most famous Sufi Saint of the first

stage, Hasan al-Basri (642-728 A.D/20-106 A.H) had once he said his disciples or students that *I have seen many people among the companions of Prophet for them the world, not more than the dust of their foot.* He met many senior companions. They wore simple garments that were made from the camel's hair, due to always involved in the righteous life that they were lost for the world. *Were the best among you to see, they would think:'These people do not believe in the Day of Judgement,* says Hasan al-Basri, testifying to the fact that theirs was the profound consciousness of the sin of disobedience and an extreme dread of divine punishment. They often spent the whole night in vigil, repeating the Qur'ānic verses.

Hasan al-Basri

Hasan al-Basri (642-728 A.D/20-106 A.H) was a prominent Sufi personality among the early Sufi Saints, who emphasized unnecessary worldliness, piousness, and fear of Allah. He was born in Medina and later on migrates to Basra and settled there. In all the possibilities, Hasan was too young in age for becoming a disciple of Ali Bin Abi Talib (d.661 A.D/39 A.H), however, almost all Sufi orders traced their spiritual lineage from Prophet of Islam (ﷺ) through Ali. According to some Sufi traditions, as they assumed that Hasan, became Ali's student or disciple due to many indescribable spiritual experiences.

Mālek ibn Dināŕ

Mālek ibn Dināŕ al-Sāmi (d.130 A.H/748 A.D) was also a famous Sufi; his father was a Persian slave from Sejestān (Kābul) and later on, became a disciple of Hasan al-Basri. His conversion starts with one evening he had been enjoying himself with a party of friends. When they were all asleep a voice came from a lute which they had been playing: *O Malik! Why dost thounnot repent?* Malik abandoned his evil ways and went to Hasan Al Basra, and showed himself dedicated in repentance. He attained to such a high degree in the Spirituality. Malik bin Dinar was one of the first Muslims who came to India for propagating Islam in Indian Subcontinent after the departure of King Cheraman Peruman (Tajuddin).

Rabi'a al-Basri

Rabi'a al-Basri (713-801 A.D/91-179 A.H) was a younger contemporary of Hasan Basri. Both of them knew each other well. She was born in Basra and spent her whole life there. She belonged to a poor family and during a famine she was sold into slavery. She used to worship Allah whenever she could. Finally, her master, impressed by her pietistic nature and tolerance decided to liberate her. From then on, she devoted all her time to Allah.

She opined that Allah should be loved and worshipped without any selfish end in mind. She criticized thosewhoworshippedAllah to secureHis favours. She went so far as to say:*'I want to light a fire in Paradise and pour water in Hell so that people no longer worship Allah for hope of Paradise or for fear of Hell.' She prayed:'O my Lord, if I worshipYou from fear ofHell, burn me in Hell,and if I worshipYou out of hope of Paradise, exclude me from it, but if I worshipYou forYour own sake, then do not withhold from meYour eternal beauty'.*

Ibrahim Bin Adham

Ibrahim Bin Adham (d.782 A.D/160 A.H) was born in a royal family of Balkh. He was a hunter and once was on hunting and followed a deer due to this he loses his way in the forest. During his stay in the forest once he heard a strange crying voice: *Awake! Were you created for this?* After heard these words his heart was too touched and he began to involve himself in heart-purification. And at the end, Ibrahim found that his way of life was not according to the commandment of Allah and, therefore, decided to change the ways of life. He starts to remember Allah the whole night after he repented and asked Allah for forgiveness for spent

a careless life before. Very next day Ibrahim became a transformed man. After that, he left all his property and join Abdul Wahid bin Zayed, who was a great spiritual teacher and disciple of Hasan al-Basri.

The practice of the early Sufi Saints

By the time of Hasan Basri, Rabi'a al-Basri and Ibrahim Bin Adham (8th and 9thcentury AD) asceticism had become the dominating feature of a movement, which later came to be known as *Tasawwuf*. The Sufi Saints wanted to withdraw from the world and spend all their time to worshipping Allah. They were convinced that, in order to concentrate on this spiritual path, it was crucial for them to withdraw themselves from the world. This was possible only by limiting their needs to the bare minimum. All the time they had at their disposal was to be spent in performing supererogatory prayers (*Nawāfil*), fasting and so on. They took extra care to spend their day in the honest remembrance of Allah. In this process, they got strayed a little from the path of Allah, as Qur'ān and Hadith showed clearly the pleasure of Allah.

The Sufi Saints of the primary stage thought that the lesser the materialistic belongings, the more they would be able to devote themselves selflessly to the worship of Allah. Therefore, they thought that having fewer goods was taken as an authenticity for securing entry into paradise. Just because of this reason why the Sufi Saints held poverty in high regard.Due to this, hand and the heart must be empty to attain the desirable-goal. The absence of desire implied total liberty from all things and was considered as 'real poverty' from the Sufi point of view.This concept stated by a later Sufi saint, Nizamuddin Awliya (d.1325 A.D/803 A.H) in these words-*Rejection of the world does not mean that one should strip oneself of one's clothes and sit idle. Rejection of the world means that one may put on clothes and take food. But one should not set one's heart on anything.This and this alone is rejection of the world.*

Although, no one should forget that the Sufi Saints of early-stage all were practicing Muslims. They pragmatic all obligatory forms of worship. Due to this practice, some called them as orthodox Muslims.But in fact, they meaningfully highlighted on certain points in the teachings of Qur'ān and Hadith. Increasingly, additional worship (*Nawāfil*) came to have more importance connected to them than the mandatory forms of worship.

Conclusion

Tasawwuf (Sufi Saints) considers itself for a quest of right path and truth and all its dimensions provide service to this world. This spiritual journey is so difficult and it required many sources. For this, the *Dhikr of Allah* (Remembrance of Allah) and *Muraqaba* (existence of mystery of Being and Creation) are the best way.Although, ultimately, it is Allah who provides His grace for the traveller and no one can try to his spiritual exercise with comparison to Allah's compassion. Once a Sufi dreamt that he saw the great Sufi Saint Junayd al-Baghdadi and asked him how Allah dealt with him. Al-Baghdadi said- *Allah forgave me through His mercy, not for my spiritual activities and practices, rather for just two Rakat namaz (prayer) which I offered to Allah at midnight*. So, *Tasawwuf* emphasized the spiritual practices within the true guidelines of Islam.

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A STUDY ON WORKING CAPITAL MANAGEMENT IN NLC INDIA LIMITED AT NEYVELI

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Abstract

Analysis of Working Capital Management is the process of identifying the Operational Efficiency and measure the firm establishing relationship between balance sheet and profit and loss account. The study was undertaken in the NLC India Limited with the view to have an insight in the Working Capital Management, Ratio analysis of India Limited.

Results reveal that unfavourable status of current working capital management system, and the same should be thoroughly rechecked using proper cost control and taking remedial measures. We hope that the management of the company can do wonders in working capital management and the coming years will reveal an entirely different picture showing favorable results.

Keywords: *Working Capital Management, NLC India Limited Working Capital management, Liquidity Management, Inventory Management, Debtor turnover Ratio.*

INTRODUCTION

Working capital is a financial tool to measure the operating liquidity available to organisations or business, working capital is considered as a part operating capital gross working capital is equal to current assets. Working capital is measured as current assets - current liabilities, if current assets are compared with current liability is very less, the organization has working capital deficiency, it's also called as working capital deficit.

A company can be empowered with assets and profitability but may fall short of liquidity it its assets cannot be readily converted into cash. Positive working capital is required to ensure that firm is able to continue its operation and it has a sufficient fund to satisfy to meets its current obligation and future operational expenses. The management of working capital involved managing the accounts receivables and payable, managing the inventories and cash.

Most of the organisations have a large amount cash invested in working capital, as well as substantial amount of Short term payables as a course of financing. Organisations have an optimal level working capital that maximizing their values. Large inventory and generous trade credit policy may lead to higher sales and reduces risk of a stock out.

Based on the previous studies related to working capital management in NLC India Limited are no sufficient, the present study is initiated on measuring the working capital management of NLC India limited in past five years through various statistical tools.

PROFILE OF NLC INDIA LIMITED

NLC India Limited formerly Neyveli Lignite Corporation (NLC) is a company in the biggest opencast mining sector and thermal power generation in India. A Navratna company under the ministry coal in India since 1956 – more than 60 Years of its glorious existence, its annually produces about 30 million tonnes of lignite from opencast mines at Neyveli in the state of Tamil Nadu and Barsingar in Rajasthan State. the lignite is used at pithead thermal power station of 3640 MW installed capacity to produce electricity and its joint venture has a 1000 MW thermal power station using coal. Lately is it diversified into renewable energy production and installed Solar and Windmills plants to produce electricity photovoltaic (PV) cells and wind mills. The present power generation capacity is 3640 MW (lignite), 1000 MW (Coal),1352.56 MW (Solar),51 MW (Wind) Totally 6043.56 MW

REVIEW OF LITERATURE

Hyon – Han Shin an LUC Soemen (1998) The study is on the efficiency of the working capital management and business profitability. There are 58 companies are taken for the research and period for the study is 1975 to 1994, study found that there is a strong negative relationship if firm having long Net Trade Cycle and its profitability. In other side short Net Trading cycle created the risk. It has also found measuring liquidity differently, need to be maintain appropriate current ratio having positive relation with profitability.

Singh O. N. (1999) The research discussed the needs of credit to the farmers or agriculture segment and another need is having proper system of working capital finance in agriculture segment in line and commerce finance, with some changes. Research advised a system which is quite similar useful and fulfill the need of both farmers as well as the bankers. Main aim of the study is to make farmers strong in terms of capital.

RaoGovinda D. and Rao P. M. (1999) Study believes that management of working capital is a constant process need of finance proper observation or monitoring and revising the relationship of all variables and give conclusion. This is a proper indication to the manager.

Dutta (2000) Author Dutta has done study on "Working Capital Management of Horticulture Industry in Humachal Pradesh" that was a case study of Himachal Pradesh Horticulture Produce Marketing and Processing Corporation for the stage 1991 to 1998.

Jain P. K. and YadavSurendra S. (2001) That was a study of corporate Working capital management related practices in India, Singapore and Thailand. This study tried to understand the relationship of working capital management and current assets and current liabilities. In other hand, authors have revealed the analysis liquidities ratios like current assets and current liabilities.

Parvathy (2004) Observation of study has shown that in increasing in mode, but net profit has in decreasing in trend because operating cost is high. The others found out and thrown light on the importance of cost of production. Other side found that the return on network and

the return to total assets were on the decreasing trend.

Filbeck Greg and Krueger Thomas M. (2005) As per the article, need to study internal working capital management and working capital performance. That article was published in CFO magazines. As per the findings of this article macro economic factors, interest rates, competition, etc. having impact on working capital management.

Meszek Wieslaw and Polewski Marcin (2006) By observation of selected construction companies at area of working capital management and working capital policy formation and strategies implication. The Study was based to develop the controlling methodology for working capital. here, study that was going on construction company having the specific factors are to be consider like functional factors and market requirements which make working capital area wide and more focused.

Chowdhury Anup and Amin Md. Muntasir (2007) That was the study carried on pharmaceutical companies listed in Dhanka Stock Exchange. Observation of the study based on the financial management, according to this major problem found in area of working capital management. It is true that working capital effects go on business performance and growth.

Arindam Ghosh (2007) That was the study carried on Cement Industry of India specific area of study was "Working Capital Management and its practices and impact on profitability. Main aim of the study is to evaluate efficiency of working capital management of selected cement companies in India during the period 1992 to 2001. For the study targeted 20 large cement companies avail in India having very large portion in cement industry of India.

Samiloglu F. and Demirgunes K. (2008) The objective of the study is to examine effect of working capital management on firm's prosperity. The study carried with manufacturing companies listed in Istanbul Stock Exchange (ISE) the tenure for the study is 1989 to 2007. For the study multi regression statistical method is used.

Virani Varsha (2008) It was a comparative study in CADILA COMPANY This study has been done with certain objectives first is to examine financial performance and second one is to examine profitability trend and at the last to find out assets operational model and evaluate liquidity position of the company. To achieve these goals used two classy analytical tools i.e. ratio analysis and correlation analysis. The study shows relationship between different ratios.

Ramachandran Azhagaiah and Janakiraman Muralidharan (2009) In this study author examine the relationship among working capital management proficiency and earnings before interest and tax. The study was made on Paper industry in India during 1997 to 2005

Rao and Rao&Ramachandran (2010) Main aim of his study is to evaluate the trends and parameters of effectiveness of working capital and its utilization in terms of volume of the firms of cotton textiles industry in India. For that three parameters are taken i.e. different indices first one performance Index, utilization index and efficiency Index.

Rahman Mohammad M. (2011) Research is based on correlation among working capital and profitability. To analyze the effectiveness of working capital management of the selected textile companies. Conclusion of the study found that overall good management in working capital management of selected textile companies and thus most of the companies are profitable way going on.

Arbab Ahmed and Matarneh Bashar (2011) Research carried with registration technique which is very powerful statistical tool to forecast the working capital. The area of working capital management, that is possible to make the

projection after starting the average relationship in the past. For the purpose different components are used and to be finalized result. And it is presented in diagrammatic way as well mathematical way.

KaddumiThair A. and Ramadan Imad Z. (2012) The evaluation was made in 49 jordanian companies they are listed in Amman Stock Exchange, The carried with topic like effect of working capital management on the profitability in a targeted companies for the period 2005 to 2009.

Kaur Harsh V. and Singh Sukhdev (2013) This article focuses on cash conversion efficiency and setting up the operating cycle days. The study tests the relationship between the working capital attain and profitability calculated by income to current assets and income to average total assets. Authors did study with companies listed in BSE 200 that is spread over 19 industries for the period 2000 to 2010.At the end, the study lay emphasis on that proficient management of working capital notably affects profitability.

Madhavi K. (2014) She has done research based on empirical study of co relation among liquidity position an profitability of the paper mills in Andhra Pradesh. That has been evaluated ineffective working capital negatively effect on profitability of the paper mills.

Gurumurthy N. and Reddy Jayachandra K. (2014) He has conducted serve and observed working capital management position in four pharmaceutical companies APSPDCL, APEPDCL, APNPDCL and APCPDCL and come out with fact that working capital management was not so good in position and need to do better.

OBJECTIVES OF STUDY

To familiarize the following by analyzing annual report for the past 5 years.

- To analyze the liquidity position of the company.
- To analyze the performance of the company.
- To estimate the amount of working capital of the company for a period of 5 years.
- To project the future position.
- To offer suggestions for improving the working capital position of the company.

NEED AND SCOPE OF THE STUDY

Working capital is needed in every organization to meet day-to-day business activities. Since there is a time lag between the sale of produce and realization of cash, every organization requires Sufficient amount of working capital to meet the daily requirement and to tackle the problem as and when they arise for the smooth running of the business. The study relates to the working capital management in NLC India Limited. The study gives an idea about the working capital position of the company. The study also reveals the method by which the company has been financed. The study will be helpful for the management in decision making relating to working capital

PERIOD OF STUDY

This study contains the working capital analysis for the period of Five years from 2014-2015 to 2018-2019. The accounting year is starting from 1st April to 31st March.

DATA COLLECTION

The analysis of financial condition and performance of the enterprise necessitates and reliable data therefore the data for the present study is collected with the help of secondary data.

SECONDARY DATA

The secondary data is mainly used for the study. It is taken from published source of the company like the annual report magazines, report and other financial official records.

GRAPHS

The interpretation of the financial statement results are done through graphs for clear perception.

TOOLS AND TECHNIQUES

The following tools and techniques of financial analysis are used as a measure of judging the degree of efficiency of financial performance analysis of the company.

- Ratio Analysis , Trend Analysis, Pearson's Correlation Analysis , Chi – Square Test , and ANOVA

Table 1
Component Of Current Asset And Current Liabilities In NLC India Limited

		Years				
		2014-15	2015-16	2016-17	2017-18	2018-19
		₹ in crores				
Current Assets	Inventories	898.63	1,277.49	1,813.24	1,688.90	1,464.38
	Trade Receivables	2,282.07	3,060.15	5,066.00	3,366.15	4,606.19
	Cash & Bank Balances	3,265.47	3,157.97	473.70	278.65	317.16
	Short Term Loans	1,423.89	1,035.41	638.49	1,989.74	716.60
	Other Current Assets	302.21	195.14	717.33	2,811.42	1,929.08
	TOTAL	**8,172.27**	**8,726.16**	**8,708.76**	**10,134.86**	**9,033.41**

From the above table inferred that, Current Assets alternates between increase and decrease during the study period. However, it stands around the average value of Rs.8, 955.10 Crores.

Table 2
Components of current liabilities

		Years				
		2014-15	2015-16	2016-17	2017-18	2018-19
		₹ in crores				
Current Liabilities	Trade Payables	631.41	970.61	707.44	495.24	1,988.07
	Tax Liabilities	422.11	424.65	249.66	657.78	510.10
	Short Term Borrowings	-	-	130.81	1,457.80	3,668.00
	Other Current Liabilities	1,217.61	1,152.97	3,201.44	3,138.58	1,920.24
	TOTAL	**2,271.13**	**2,548.23**	**4,289.35**	**5,749.40**	**8,086.41**

From the above table inferred that, Current Liabilities are steadily increasing from Rs.2, 271.13 Crores to Rs.8, 086.41Crores. Its average being Rs.4,588.90 crores.

Table 3
Current assets vs. Current liabilities

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Current Assets	8,172.27	8,726.16	8,708.76	10,134.86	9,033.41
Current Liabilities	2,271.13	2,548.23	4,289.35	5,749.40	8,086.41

From the above table inferred that, Current Assets are fluctuating however its average is Rs.8,955.10 crores whereas Current Liabilities are increasing from Rs.2,271.13 crores to Rs.8,086.41 crores.

Table 4
Calculation of working capital

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Current Assets	8,172.27	8,726.16	8,708.76	10,134.86	9,033.41
Curreent Liabilities	2,271.13	2,548.23	4,289.35	5,749.40	8,086.41
Working Capital	5,901.14	6,177.93	4,419.41	4,385.46	947.00

From the above table its identified that, Working Capital is decreasing year by year but it has risen to Rs.6,177.93 crores during the year 2015-16.

Table 5
Current ratio

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Current Assets	8,172.27	8,726.16	8,708.76	10,134.86	9,033.41
Current Liabilities	2,271.13	2,548.23	4,289.35	5,749.40	8,086.41
Current Ratio	**3.60**	**3.42**	**2.03**	**1.76**	**1.12**

From the above table it's identified that, Current Ratio is decreasing steadily from 3.60 to 1.12. During the years 2014-2017 it remains above the standard of 2.0 whereas during the years 2017-2019 it remains below the standard of 2.0. It has reached the lowest of 1.12 in the year 2018-19.

Table 6

Liquid ratio

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Liquid Assets	7,273.64	7,448.67	6,895.52	8,445.96	7,569.03
Current Liabilities	2,271.13	2,548.23	4,289.35	5,749.40	8,086.41
Liquid Ratio	**3.20**	**2.92**	**1.61**	**1.47**	**0.94**

From the above table it's identified that, Liquid Ratio is decreasing steadily from 3.20 to 0.94. During the years 2014-2018 it remains above the standard of 1.0 whereas during the years 2018-2019 it remains below the standard of 1.0. It has reached the lowest of 0.94 in the year 2018-19.

Table 7

Working capital turnover ratio

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Working Capital	5,901.14	6,177.93	4,419.41	4,385.46	947.00
Sales	6,087.68	6,669.05	8,672.84	8,496.20	7,145.92
Working Capital Turnover Ratio	**1.03**	**1.08**	**1.96**	**1.94**	**7.55**

From the above table it's identified that, Working Capital Turnover Ratio steadily moves up and there is a tremendous jump to 7.55 from 1.94

Table 8

Debtors Turnover Ratio

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Trade Receivables	2,282.07	3,060.15	5,066.00	3,366.15	4,606.19
Sales	6,087.68	6,669.05	8,672.84	8,496.20	7,145.92
Debtors Turnover Ratio %	**37.49**	**45.89**	**58.41**	**39.62**	**64.46**

From the above table it's identified that, Debtors Turnover Ratio shows a fluctuation between 37.49% and 64.46%.

Table 9

Stock Turnover Ratio

	Years				
	2014-15	2015-16	2016-17	2017-18	2018-19
	₹ in crores				
Cost of Goods Sold	4,986.38	5,639.54	6,592.36	6,410.30	6,504.68
Closing Stock	898.63	1,277.49	1,813.24	1,688.90	1,464.38
Stock Turnover Ratio	**5.55**	**4.41**	**3.64**	**3.80**	**4.44**

Stock Turnover Ratio steadily roaming around 4.5.

CHI-SQUARE TEST FOR CURRENT ASSETS

Null Hypothesis H_0: Current Assets are uniformly distributed during 2014-2019

Alternative Hypothesis H_1: Current Assets are **not** uniformly distributed during 2014-2019

Table 10

Chi-square test for current assets

	Current Assets				
Year	O	E	O - E	$(O - E)^2$	$(O - E)^2/E$
2014-15	8172.27	8955.09	-782.82	612810.28	68.43
2015-16	8726.16	8955.09	-228.93	52409.86	5.85
2016-17	8708.76	8955.09	-246.33	60679.45	6.78
2017-18	10134.86	8955.09	1179.77	1391852.53	155.43
2018-19	9033.41	8955.09	78.32	6133.71	0.68
Total	**44775.46**				**237.17**
	Calculated value of X^2		**237.17**		
	Degree of freedom (d.o.f.)		**4**		
	Significance level (SL)		**5%**		
	Table value of X^2		**9.488**		

Since the Calculated value of X^2 is more than the Table value of X^2 the Null Hypothesis is rejected, so we can conclude that Current Assets are **not** uniformly distributed during 2014-2019.

CHI-SQUARE TEST FOR CURRENT LIABILITIES

Null Hypothesis H_0: Current Liabilities are uniformly distributed during 2014-2019

Alternative Hypothesis H_1: Current Liabilities are **not** uniformly distributed during 2014-2019

Table 11
Chi-square test for current liabilities

	Current Liabilities				
Year	O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
2014-15	2271.13	4588.90	-2317.77	5372076.32	1170.67
2015-16	2548.23	4588.90	-2040.67	4164350.37	907.48
2016-17	4289.35	4588.90	-299.55	89732.60	19.55
2017-18	5749.40	4588.90	1160.50	1346750.97	293.48
2018-19	8086.41	4588.90	3497.51	12232548.22	2665.68
Total	**22944.52**				**5056.86**
	Calculated value of X^2		**5056.86**		
	Degree of freedom (d.o.f.)		**4**		
	Significance level (SL)		**5%**		
	Table value of X^2		**9.488**		

Since the Calculated value of X^2 is more than the Table value of X^2 the Null Hypothesis is rejected, so we can conclude that Current Liabilities are **not** uniformly distributed during 2014-2019.

CHI-SQUARE TEST FOR WORKING CAPITAL

Null Hypothesis H_0: Working Capital is uniformly distributed during 2014-2019

Alternative Hypothesis H_1: Working Capital is **not** uniformly distributed during 2014-2019

Table 12
Chi-square test for working capital

	Working Capital				
Year	O	E	O-E	$(O-E)^2$	$(O-E)^2/E$
2014-15	5901.14	4366.19	1534.95	2356077.64	539.62
2015-16	6177.93	4366.19	1811.74	3282409.07	751.78
2016-17	4419.41	4366.19	53.22	2832.58	0.65
2017-18	4385.46	4366.19	19.27	371.41	0.09
2018-19	947.00	4366.19	-3419.19	11690846.58	2677.59
Total	**21830.94**				**3969.72**
	Calculated value of X^2		**3969.72**		
	Degree of freedom (d.o.f.)		**4**		
	Significance level (SL)		**5%**		
	Table value of X^2		**9.488**		

Since the Calculated value of X^2 is more than the Table value of X^2 the Null Hypothesis is rejected, so we can conclude that Working Capital is **not** uniformly distributed during 2014-2019.

ANALYSIS OF VARIANCE (ANOVA)

Null Hypothesis H_0: There is **no** significant difference between the variances of Current Assets (X) and Current Liabilities (Y).

Alternative Hypothesis H_1: There is significant difference between the variances of Current Assets (X) and Current Liabilities (Y).

Table 13
Analysis of variance (ANOVA)

	CA			CL		
Year	X	X - X'	$(X-X')^2$	Y	Y - Y'	$(Y-Y')^2$
2014-15	8172.27	-782.82	612810.28	2271.13	-2317.77	5372076.32
2015-16	8726.16	-228.93	52409.86	2548.23	-2040.67	4164350.37
2016-17	8708.76	-246.33	60679.45	4289.35	-299.55	89732.60
2017-18	10134.86	1179.77	1391852.53	5749.40	1160.50	1346750.97
2018-19	9033.41	78.32	6133.71	8086.41	3497.51	12232548.22
Total	**44775.46**		**2123885.84**	**22944.52**		**23205458.47**
	X'	**8955.09**				
	Y'	**4588.90**				
	V_1	**530971.46**				
	V_2	**5801364.62**				
	F	**10.93**				

Since the Calculated value of F is more than the Table value of F at 5% Significance Level for 4 and 4 degree of freedom is 6.39, the Null Hypothesis is rejected, so we can conclude that there is significant difference between the variances of Current Assets (X) and Current Liabilities (Y).

CONCLUSION

The analysis of data such as the ratios calculated, trend lines drawn, correlation coefficient found, chi-square test results and ANOVA results show an unfavourable status of current working capital management system, and the same should be thoroughly rechecked using proper cost control and taking remedial measures. We hope that the management of the company can do wonders in working capital management and the coming years will reveal an entirely different picture showing favourable results.

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AN EMPIRICAL ANALYSIS OF ONLINE MEDIA ON BUYING BEHAVIORAL OF CONSUMERS IN MADURAI DISTRICT

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Abstract

Today, the globe is facing a brand-new phenomenon that's spreading rapidly in a very new cyberspace called online media. Online media, applications, platforms and online media aim to market interaction, collaboration and content sharing. The authors mainly discuss the impact of online media on customer purchasing intentions in Madurai, Tamil Nadu. To the present end, 200 respondents were selected using Madurai's convenience sampling technique. We constructed and used a well-structured questionnaire to gather respondent's opinions, and attenuated responses with tables, average score analysis. Consistent with the survey, the bulk of men interviewed affected online media, and other people were educated to the school level and led them to shop for products online. The results show that because the working hours of individual employees increase, they're more curious about purchasing products online through online media support, and therefore, the level of online media use has increased. Keywords: cyberspace, online media, platforms, purchasing intentions.

Keywords: *buying behaviours, purchase, marketing, customers, socio-economic*

Introduction

A media-appropriate social network that describes a series of up-to-date sources of online information that customers can create, launch, disseminate and use, with the goal of teaching each product, brand, offer, personality, and problem. Attitude toward social behavior forms behaviors that related to the customer's intentions. Because it is often related, you'll intentionally predict the particular behavior intentionally. Behavioral, subjective, and objective evaluation of a product or service also affects quality during a marketing study, purchase intentions and buying behaviors might not be similar if the brand, price or time is stable, there's a high probability of predicting purchases using purchasing intentions.

Literature Review

Online media marketing is an efficient tool that companies can use to get higher revenues. The store is open 24 hours daily, seven days per week, and twelve months a year. You have more flexibility to feature or remove products than to order from customers. This

provides exposure to untapped market segments. Customers can find products at any store within the city so that they offer way more products than local malls. You can sell items from anywhere. It helps improve customer service.

Problem Statement

Due to the massive population, the massive population of vehicles, and therefore, the crowded environment of the town, the movement of individuals buying products is extremely enthusiastic and aggravating. So, you would like a special platform that creates it is easy to get products. In turn, after the expansion of smart phones and cyberspace, online media like Facebook, Twitter, WhatsApp, etc. play an important role in everyone's lifestyle. Therefore, most product manufacturers, marketers and online shopping websites advertise their products through various eye media. It's attracted strong online media users and may easily compare products from other online websites or infer what they have

Objectives of Research

Study the Socio-Economic profile of Madurai respondents.

Identify the impact of online media on Madurai respondent's purchasing intentions.

Discover product purchasing issues among sample respondents.

Research Design

The study is complied with the both primary and secondary data. The researcher has selected the respondents on the idea of sampling method. Respondents are selected equally from Madurai district to the different status of the society as per random method. The sample size is decided 200 respondents. There are differing types of statistical tools for analysis the collected data the important tools utilized in this study is like Percentage analysis, Chi-Square test, Weighted Ranking technique, and Liker's five-point scale are used for data analysis and interpreted.

Data analysis and interpretation

The social-economic variables such as gender, age, marital status, education, qualification, monthly income of the respondents are analyses through percentages.

Table 1
Social factor that affects the acquisition intention

Factors	Chi-Square Value		Degree of Freedom	Significant
	Calculated Value	Table Value		
Gender	11.09	5.99	2	*S
Age	15.24	7.81	3	*S
Marital status	7.32	9.48	4	*S
Education	10.07	7.81	3	*S
Occupation	12.41	5.99	2	*S
No. of earning members	5.96	7.81	3	*S

There is no significant impact of purchase intention between the respondent's social factors The table above shows that the social factors like gender, age, education, and occupation, the calculated value of chi square test is bigger than the table value, the null hypothesis is rejected. Hence, it's inferred that gender, age, education, and occupation influence the acquisition intention. Hence, there's significant impact between purchase intention, and therefore, the respondents' gender, age, education, and occupation towards the acquisition. The social factors like legal status and number of earning members, the calculated value of chi square test is a smaller amount than the table value, and therefore, the null hypothesis is accepted. Hence, it is inferred that legal status and number of earning members doesn't influence the

acquisition intention. Hence, there's no significant impact between purchase intention, and therefore, the respondents' legal status, and number of earning members towards the acquisition.

Table 2

Impact of online media on purchase intentions

Factors	Weight	1	2	3	4	5	Total	Weighted Score	Rank
Attraction of service	Respondents	87	31	43	28	11	200	60	II
	Weightage	20%	25%	25%	20%	10%	100%		
	Weight	17.4	7.75	10.75	5.6	1.1	17.4		
Increases the interest	Respondents	98	34	38	23	7	200	62.5	I
	Weightage	20%	25%	25%	20%	10%	100%		
	Weight	19.6	8.5	9.5	4.6	0.7	19.6		
Like to buy	Respondents	71	46	43	31	9	200	57.75	IV
	Weightage	20%	5%	25%	20%	10%	100%		
	Weight	14.2	11.5	10.75	6.2	0.9	14.2		
Definitely buy	Respondents	97	31	19	28	25	200	59.4	III
	Weightage	20%	25%	25%	20%	10%	100%		
	Weight	19.4	7.75	4.75	5.6	2.5	19.4		
Intend to purchase	Respondents	68	51	37	26	18	200	56.2	V
	Weightage	20%	25%	25%	20%	10%	100%		
	Weight	13.6	12.75	9.25	5.2	1.8	13.6		

Chi-Square test reveals that all the Socio-economic variables are significantly related to the Weighted Ranking technique has been used to interpret the factors determining the attitude of customers towards online media marketing

Findings

Analysis suggests that the majority of the interviewees can make better decisions before the purchasing products and services through online media support.

Analysis revealed significant differences between the means of various categories of independent variables selected, like age, education level, occupation, legal status, and level. Monthly income and knowledge using online media, and variable online media affects your purchase intentions. However, there's no significant difference between the means of a male and feminine interviewed and therefore, the impact of online media on the intention to get within the research domain.

Conclusion

Research shows that middle-aged respondents recognized online media's greatest impact in the rapidly changing world of technology, Madurai seems to possess experienced rapid climb in online media used in recent years, which allows certain studies to be conducted within the context of the country. The results support the very fact that a lot of people living in Madurai are very involved in online media platforms like Facebook and Twitter. The study concluded that, speed, and therefore, the extent of data which will be gained from online

media marketing, there are variety of serious is advantages to the present sort of marketing those businesses take. The technology driven approach of selling leaves certain businesses vulnerable and overly -dependent upon technology. It plays a big role in influencing customer preference and selection towards various brands.

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ANALYSIS OF WASTE WATER TREATMENT IN INDIA

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Abstract

Nowadays many water resources are polluted by anthropogenic sources including household and agricultural waste and industrial processes. Public concern over the environmental impact of wastewater pollution has increased. Several conventional wastewater treatment techniques, i.e. chemical coagulation, adsorption, activated sludge, have been applied to remove the pollution, however there are still some limitations, especially that of high operation costs. The use of aerobic waste water treatment as a reductive medium is receiving increased interest due to its low operation and maintenance costs. In addition, it is easy-to-obtain, with good effectiveness and ability for degrading contaminants. This paper reviews the use of waste water treatment technologies to remove contaminants from wastewater such as halogenated hydrocarbon compounds, heavy metals, dyes, pesticides, and herbicides, which represent the main pollutants in wastewater.

Keywords: *Sewage, Aerobic, Treatment, Technologies.*

INTRODUCTION

Water, food and energy securities are emerging as increasingly important and vital issues for India and the world. Most of the river basins in India and elsewhere are closing or closed and experiencing moderate to severe water shortages, brought on by the simultaneous effects of agricultural growth, industrialization and urbanization. Current and future fresh water demand could be met by enhancing water use efficiency and demand management. Thus, wastewater/low quality water is emerging as potential source for demand management after essential treatment. An estimated 38354 million liters per day (MLD) sewage is generated in major cities of India, but the sewage treatment capacity is only of 11786 MLD. Similarly, only 60% of industrial waste water, mostly large scale industries, is treated. Performance of state owned sewage treatment plants, for treating municipal waste water, and common effluent treatment plants, for treating effluent from small scale industries, is also not complying with prescribed standards. Wastewater- irrigated fields generate great employment opportunity for female and male agricultural laborers to cultivate crops, vegetables, flowers, fodders that can be sold in nearby markets or for use by their livestock. However, there are higher risk associated to human health and the environment on use of

wastewater especially in developing countries, where rarely the wastewater is treated and large volumes of untreated wastewater are being used in agriculture.

1.1 Water Availability and Use: India accounts for 2.45% of land area and 4% of water resources of the world but represents 16% of the world population. Total utilizable water resource in the country has been estimated to be about 1123 BCM (690 BCM from surface and 433 BCM from ground), which is just 28% of the water derived from precipitation. About 85% (688 BCM) of water usage is being diverted for irrigation (Figure 1), which may increase to 1072 BCM by 2050. Major source for irrigation is groundwater. Annual groundwater recharge is about 433 BCM of which 212.5 BCM used for irrigation and 18.1 BCM for domestic and industrial use (CGWB, 2011). By 2025, demand for domestic and industrial water usage may increase to 29.2 BCM. Thus water availability for irrigation is expected to reduce to 162.3 BCM. With the present population growth-rate (1.9% per year), the population is expected to cross the 1.5 billion mark by 2050. Due to increasing population and all round development in the country, the per capita average annual freshwater availability has been reducing since 1951 from 5177 m3 to 1869 m3, in 2001 and 1588 m3, in 2010. It is expected to further reduce to 1341 m3 in 2025 and 1140 m3 in 2050. Hence, there is an urgent need for efficient water resource management through enhanced water use efficiency and waste water recycling.

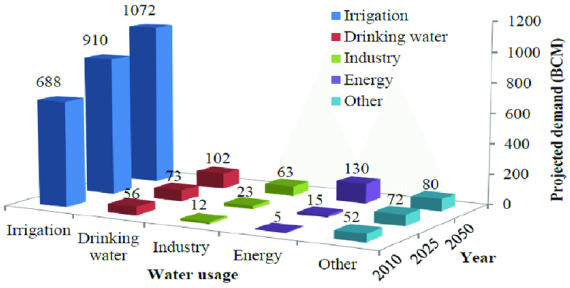

Fig1: Projected water demand by different sectors (CWC, 2010)

1.2 Wastewater Production: With rapid expansion of cities and domestic water supply, quantity of gray/wastewater is increasing in the same proportion. As per CPHEEO estimates about 70-80% of total water supplied for domestic use gets generated as wastewater. The per capita wastewater generation by the class-I cities and class-II towns, representing 72% of urban population in India, has been estimated to be around 98 LPCD while that from the National Capital Territory-Delhi alone (discharging 3,663 MLD of wastewaters, 61% of which is treated) is over 220 LPCD (CPCB, 1999). As per CPCB estimates, the total wastewater generation from Class I cities (498) and Class II (410) towns in the country is around 35,558 and 2,696 MLD respectively. While, the installed sewage treatment capacity is just 11,553 and 233 MLD, respectively thus, overall analysis of water resources indicates that in coming years, there will be a twin edged problem to deal with reduced fresh water availability and increased wastewater generation due to increased population and industrialization. In India, there are 234-Sewage Water Treatment plants (STPs). In class-I cities, oxidation pond or Activated sludge process is the most commonly employed technology, covering 59.5% of total installed capacity Series of Waste Stabilization Ponds technology is also employed in 28% of the plants, though its combined capacity is only 5.6%.

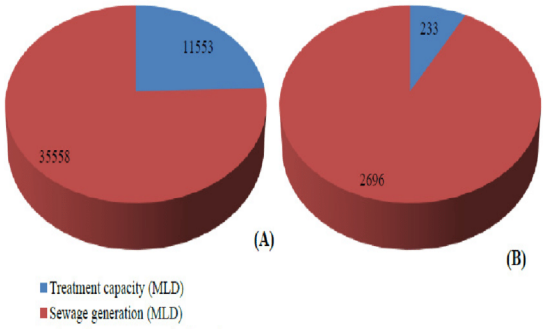

Fig: Sewage generation and treatment capacity in 498 Class I cities and 410 class II towns in India. (CPCB, 2009)

2. WASTE WATER TREATMENT PROCESS

2.1. Conventional methods of treating waste water- The CPCB has studied the functioning of water treatment plants, the prevailing raw water quality and water treatment technology, etc across the country. As per its findings, the following process has been followed by these plants for treating waste water:

(i) Aeration- Aeration involves bringing air or other gases in contact with water to

- Convert volatile substances from liquid to gaseous state and
- Dissolves beneficial gases into the water.

Fig: Aeration

(ii) Coagulation and Flocculation: The process of coagulation and flocculation may be broadly described as a chemical/physical process of blending or mixing a coagulating chemical into a stream and then gently stirring the blended mixture.

- **Coagulation-** Herein, a coagulant (say, alum) is thoroughly mixed with raw water which causes neutralization of charge of particles. The coagulant chemicals, inorganic and/or organic in nature, when added to water at an optimum dose (normally in the range of 1 to 100 mg/l) cause destabilization.
- F**locculation**- After coagulation, the water is then flocculated, i.e. it is gently stirred to enhance the contact of destabilized particles and to build floc particles of optimum size, density, and strength to be subsequently removed by settling or filtration.

(iii) Sedimentation and filtration: The flocculated water is then taken to sedimentation tanks / clarifiers for removal of flocs and thereafter to filters where the remaining turbidity is removed.

(iv) Backwashing of filters: As the amount of solids retained in a filter increases, bed porosity decreases. Before they start breaking through the filter, backwashing is required to clean the bed.

(v) Disinfection: Disinfection of potable water system is the specialized treatment for destruction or removal of organisms in water which are capable of causing disease. For such disinfection, the chemical that has been predominantly used is chlorine. This chlorination system consists of six separate subsystems:

- chlorine supply;
- storage and handling;
- safety provisions;
- chlorine feed and application;
- diffusion, mixing and contact; and
- The control system.

2.2. Use of bio-technologies for waste water treatment

According to the CPCB, for treatment of waste water, use of biological methods can be a more cost effective option than use of conventional treatment systems. The bio-technology is less expensive, easy to operate and does not produce secondary pollutants. A few instances of bio-technologies used for treatment of wastes have been described below:

i) Anaerobic technology- The application of anaerobic technology avoids heavy machinery and reduces the land requirement for the waste water treatment plant. The anaerobic process includes the use of the acclimatized microbes for transforming complex macromolecules of organic matter present in waste water into biogas. Also, the stabilized sludge from anaerobic process may be free from strong or foul odors.

The output that it produces, i.e. biogas and digester-sludge can be utilized as an alternate source of energy and as a fertilizer respectively.

ii) Duckweed based waste water treatment- For the purpose of setting up a low cost waste water treatment technology which will also utilize the nutrients in waste water. It has great ability to reduce the suspended solids, bacterial and other pathogens from waste water. As per its findings, this system can be used for small towns or in rural/semi rural areas, where land is available and harvested duckweed can be used for different economic uses.

iii) Enzymatic treatment- Oxidative enzymes such as peroxides are used for removal of toxic organic and recalcitrant compounds from drinking water sources as well as from industrial effluents.

iv) Bio-filters- The environmentally sustainable and economically viable bio-filters technology uses earthworms and beneficial microbes to break down organic waste present in the waste water and also converts the energy, carbon and other elements of the waste to bio nutritional products such as humus and bio-fertilizer.

1. WASTE WATER USE

Insufficient capacity of waste water treatment and increasing sewage generation pose big question of disposal of waste water. As a result, at present, significant portion of waste water being bypassed in STPs and sold to the nearby farmers on charge basis by the Water and Sewerage Board or most of the untreated waste water end up into river basins and indirectly used for irrigation. In areas like Vadodara, Gujarat, which lack alternative sources of water, one of the most lucrative income-generating activities for the lower social strata is the sale of wastewater and renting pumps to lift it **(Bhamoriya, 2004).** It has been reported that irrigation with sewage or sewage mixed with industrial effluents results in saving of 25 to 50 per cent of N and P fertilizer and leads to 15-27 % higher crop productivity, over the normal waters (Anonymous, 2004). It is estimated that in India about 73,000 ha of (Strauss and Blumenthal, 1990) per-urban agriculture is subject to wastewater irrigation. In peri-urban areas, farmers usually adopt year round, intensive vegetable production systems (300-400% cropping intensity) or other perishable commodity like fodder and earn up to 4 times more from a unit land area compared to freshwater (Minhas and Samra, 2004).

Major crops being irrigated with waste water are:

→ **Cereals:** Along 10 km stretch of the Musi River (Hyderabad, Andhra Pradesh) where wastewater from Hyderabad is disposed-off, 2100 ha land is irrigated with waste water to cultivate paddy. Wheat is irrigated with waste water in Ahmedabad and Kanpur.

→ **Vegetables:** In New Delhi, various vegetables are cultivated on 1700 ha land irrigated with wastewater in area around Keshopur and Okhla STPs. Vegetables like Cucurbits, eggplant, okra, and coriander in the summers; Spinach, mustard, cauliflower, and cabbage in the winters are grown at these place. In Hyderabad, vegetables are grown in Musi river basin all year round which includes spinach, amaranths, mint, coriander, etc.

→ **Flowers:** Farmers in Kanpur grow roses and marigold with wastewater. In Hyderabad, the farmers cultivating Jasmine through wastewater.

→ **Avenue trees and parks:** In Hyderabad, secondary treated wastewater is used to irrigate public parks and avenue trees.

→ **Fodder crops:** In Hyderabad, along the Musi River about 10,000 ha of land is irrigated with wastewater to cultivate paragrass, a kind of fodder grass.

→ **Aquaculture:** The East Kolkata sewage fisheries are the largest single wastewater use system in aquaculture in the world.

→ **Agroforestry:** In the villages near Hubli-Dharwad in Karnataka, plantation trees viz., sapota, guava, coconut, mango, arecanut, teak, neem, banana, ramphal, curry leaf, pomegranate, lemon, galimara, mulberry, etc. are irrigated with waste water.

3.1. Policies and institutional set-up for wastewater management: In addition to setting up treatment plants, Central Government, State Government and the Board have given fiscal incentives to industries/investors to encourage them to invest in pollution control. Incentives/ concessions available to them are:

- Depreciation allowance at a higher rate is allowed on devices and systems installed for minimizing pollution or for conservation of natural resources.
- Investment allowance at a higher rate is allowed for systems and devices listed under depreciation allowance.
- To reduce pollution and to decongest cities, industries are encouraged to shift from urban areas. Capital gains arising from transfer of buildings or lands used for the business are exempted from tax if these are used for acquiring lands or constructing building for the purpose of shifting business to a new place.
- Reduction in central excise duty for procuring the pollution control equipments.
- Subsidies to industries subject for installation pollution control devices.
- Rebate on cuss due on water consumed by industries, if the industry successfully commissions an effluent treatment plant and so long as it functions effectively.
- Distribution of awards to industries based on their pollution control activities.
- Amount paid by a tax payer, to any association or institution implementing programmers for conservation of natural resources, is allowed to be deducted while computing income tax.

Customs duty exemption is granted by the Central Government for items imported to improve safety and pollution control in chemical industries.

4. PRACTICE ON DIFFERENT ASPECTS OF WASTEWATER:

4.1. Bio-refineries wastewater treatment -Bio-refineries for the production of fuel ethanol produce large volumes of highly polluted effluents. Anaerobic digestion is usually applied as a first treatment step for such highly loaded wastewaters. At present, the anaerobic biological treatment of bio-refinery effluents is widely applied as an effective step in removing 90% of the Chemical Oxygen Demand (COD) in the effluent stream. During this stage, 80–90% BOD removal takes place and biochemical energy recovered is 85–90% as biogas (Pant and Adholeya, 2007; Satyawali and Balakrishnan, 2008). To reduce the BOD to acceptable standards, the effluent from an anaerobic digestion step requires further aerobic treatment. However, biological treatment processes alone are not sufficient to meet tightening environmental regulations (Pant and Adholeya, 2007).A proper choice of tertiary treatment can further reduce color and residual COD. Yet another approach is to use algae. The advantage of wastewater treatment using algae is that one can reduce the organic and inorganic loads, increase dissolved oxygen levels, mitigate CO2 pollution and generate valuable biomass by sequential use of heterotrophic and autotrophic algal species and the generated biomass can be an excellent source of 'organic' fertilizers. This particular aspect of algae can help remediate highly polluted wastewaters.

4.2. Municipal wastewater treatment using constructed wetlands -Constructed wetlands (CWs) are a viable treatment alternative for municipal wastewater, and numerous studies on their performance in municipal water treatment have been conducted. A good design constructed wetland should be able to maintain the wetland hydraulics, namely the hydraulic loading rates (HLR) and the hydraulic retention time (HRT), as it affects the treatment performance of a wetland (Kadlec and Wallace, 2009). Indian experience with constructed wetland systems is mostly on an experimental scale, treating different kinds of wastewater (Juwarkar et al., 1995; Billore et al., 1999, 2001, 2002; Jayakumar and Dandigi, 2002). One of the major constraints to field-scale constructed wetland systems in developing countries like India is the requirement of a relatively large land area that is not readily available. Subsurface (horizontal/ vertical) flow systems, generally associated with about a 100 times smaller size range and 3 times smaller HRTs (generally 2.9 days) than the surface flow systems (with about 9.3 days HRT, Kadlec, 2009), are therefore being considered to be the more suitable options for the developing countries. Shorter HRTs generally translate into smaller land requirement. Batch flow systems, with decreased detention time, have been reported to be associated with lower treatment area and higher pollutant removal efficiency (Kaur et al., 2012a, b). Thus, batch-fed vertical sub-surface flow wetlands seem to have an implication for better acceptability under Indian conditions.

4.3. Wastewater application methods - Farm workers and their families practicing furrow or flood waste water irrigation techniques are at the highest risk. Spray/sprinkler irrigation leads to the highest potential deposit of the salts, pathogens and other pollutants on the crop surfaces and affects nearby communities. Drip irrigation is the safest irrigation method but suffers from clogging of the emitters, depending on the wastewater total suspended solid concentrations. Use of appropriate filters such as gravel, screen and disk filters in combination with drip systems has been observed to tremendously reduce the clogging and coliform incidence.

4.4. Post-harvest interventions -Post-harvest interventions are an important component for health-risk reduction of wastewater-irrigated crops and are of particular importance to address possible on-farm pre-contamination, and also contamination that may occur after the crops leave the farm. The health hazards could be markedly lowered with adoption of some of the low cost practices such as repeated washings, exposure of the produce to sunlight and raising the crops on beds, removing the two outmost leaves of cabbage and also, cutting above some height from ground level.

5. BENEFITS

The water treatment process does not only produce clean reusable water, but also has the potential to produce various other benefits. It has the potential to reduce a country's waste production, to produce energy through methane harvesting, and the potential to produce natural fertilizer from the waste collected through the process. Below is a more detailed explanation of these benefits:

5.1. Waste Reduction: Through the treatment of wastewater, the amount of waste that is usually released into the environment is reduced thus improving environment's health. By doing so, the government in turn reduces the health risks associated with environmental pollution, and reduces the water loss induced through water pollution. Wastewater treatment also reduces the amount of money spent by a country on environmental rehabilitation projects required to battle pollution.

5.2. Energy Production: The sludge collected during the treatment process is

itself treated because it contains a large amount of biodegradable material. It is treated with anaerobic bacteria in special fully enclosed digesters heated to 35 degrees Celsius, an area where these anaerobic microorganisms thrive without any oxygen. The gas produced during this anaerobic process contains a large amount of methane, which is harvested and then burned to generate electricity. This energy can be used to power the wastewater treatment plants making them self-sustainable, and if there happens to be an excess of energy produced, it could be transported into a country's national grid. This helps lower the reliance on non-renewable energy sources such as fossil fuels, reducing a country's carbon footprint and a country's expenditure on energy production. An example of this system being used within the Middle East can be found in al-Samra wastewater treatment plants in Jordan. According to government officials the plant produces 40% of the energy it requires through burning the methane produced by the treatment process.

5.3. Fertilizer Production: Any biodegradable material remaining is dried in "drying lagoons" and is then turned into natural fertilizer. The resulting natural fertilizer is then used in the agricultural sector, increasing crop yields. This decreases the use of chemical fertilizers that pollute the surrounding marine and surface ecosystems.

6. CONCLUSIONS

In developing countries like India, the problems associated with wastewater reuse arise from its lack of treatment. The challenge thus is to find such low-cost, low-tech, user friendly methods, which on one hand avoid threatening our substantial wastewater dependent livelihoods and on the other hand protect degradation of our valuable natural resources. The use of constructed wetlands is now being recognized as an efficient technology for wastewater treatment. Compared to the conventional treatment systems, constructed wetlands need lesser material and energy, are easily operated, have no sludge disposal problems and can be maintained by untrained personnel. Further these systems have lower construction, maintenance and operation costs as these are driven by natural energies of sun, wind, soil, microorganisms, plants and animals.

Hence, for planned, strategic, safe and sustainable use of wastewaters there seems to be a need for policy decisions and coherent programs encompassing low-cost decentralized waste water treatment technologies, bio-filters, efficient microbial strains, and organic / inorganic amendments, appropriate crops/ cropping systems, cultivation of remunerative non-edible crops and modern sewage water application methods.

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BASIC PRINCIPLE OF BUILDING PLANNING

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Abstract

A building must have flexible and technologically-advanced working environments that are safe, healthy, comfortable, durable, aesthetically-pleasing, and accessible. The paper describes about the Basic Principle of planning of an building considering the functional factors such as orientation, lighting and ventilation, and activity and circulation space planning. These elements relate to the fit between the building and the user's activities. The planning satisfies specific space and equipment needs of the tenant. This presents a conceptual framework aimed at implementing sustainability principles in the building industry. The proposed Principle based on the sustainable triple bottom line principle, includes resource conservation, cost efficiency and design for human adaptation. Following a thorough literature review, each principle involving strategies and methods to be applied during the life cycle of building projects is explained and a few case studies are presented for clarity on the methods. This Principle will allow designer teams to have an appropriate balance between economic, social and environmental issues, changing the way construction practitioners think about the information they use when assessing building projects, thereby facilitating the sustainability of building industry.

Keywords: *Planning, Aspect, Prospect, Roominess, Grouping, Sanitation, Flexibility, Elegance, Practical consideration.*

INTRODUCTION

The term planning of building by an engineer is used to mean the arrangement of all the units of a building on all floors and at all levels and it not only includes the horizontal layout but also it takes into consideration the height and level to accommodate the space enclosed by walls, floors and roofs. The planning of the building is done to arrange the location their sizes so that it should fulfill the requirements for which it is constructed. During the planning of town, various types of buildings are arranged systematically. Roads sewer lines water supply lines, electric lines, school, cinemas houses, parks, hospitals, residential building, shopping areas etc. are well located. Each type of building has its own requirements to suit its purpose in the best possible manner. The functional planning is done in the best possible manner. To avoid haphazard development of town which creates lots of problem, the corporations of all cities have laid down the building bye-laws which govern the various aspects of the building planning. Main consideration of planning is:

- Human habitation and their requirement.
- Bye-laws for planning and construction.
- Topography and size of plot.
- Climatic condition and effect.
- Available finance
- Location and neighborhood
- Comfort, Safety and Economy

2. BASIC REQUIREMENTS OF BUILDING PLANNING

2.1 Utility of Space: The planning of building has to give due consideration to the utility of the building. A residence must have living room, bed room, kitchen, bath, W.C., verandah and circulation space.

2.2 Selection of Site: The selection of the site has an important bearing on the planning as well as designing a building**.** A building has to planned depending on the location and the geometry of the site. Owner should keep in mind the requirement as per family size and life style while purchasing land for residence.

2.3 Regulation and Bye- Laws: Local authorities have defined certain rules for the construction of various type of building. Owner and engineer must consider them while purchasing the land and planning for that land. Front margin should be left as per the exposure to NH, SH, MDR, ODR.VR, urban obeyed.

2.4 Orientation of Building: The setting of plan of building en its sites with reference to the directions is known as orientation. Direct sun light, wind, rain fall its intensity and type of surroundings are taken into consideration while deciding orientation of the building. The long wall of the building should be place towards north and south. The short wall should be place towards cast and west.

The various principles, which should be kept in view while planning of buildings, can be broadly summarized as under:

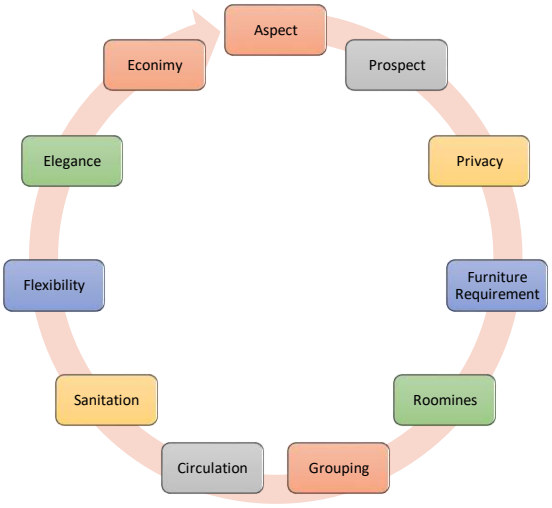

Fig 1 Principle of Planning

3. ASPECT

Aspect is concerned with the orientation of the building. The aspect of the house should be such that it enables the family members to live comfortably. Aspect meant the peculiarity of the arrangement of doors and windows in the external walls of a building, particularly of residential buildings, which allow the occupants to enjoy the natural gifts Such as sunshine, breeze, Scenery etc. Aspect provides comfort and is important from the hygienic point of view as well. A room receiving light and air from any particular direction is said to have aspect of that direction. A building must be designed to suit the site with all its varying aspects. Aspect is a very important consideration in the planning of a building. It influences the appearance of a building.

3.1 Living Room- The living rooms should have southern or south-cast aspect. The sun is towards south during cooler days and the living rooms with south aspect will be benefitted by the sunshine when it is desired in winter and obviate automatically during summer as the sun would be on northern side, over head or at high altitude, towards south.

3.2 Kitchen-A kitchen should have eastern aspect so as to admit morning sun to refresh and purify the air. The kitchen

would remain cool during the latter part of the day

3.3 Bed Room-All the bedrooms should have west or south aspect. West or South-west aspects the breeze required particularly in summer would prevail from that side. There will be no sun from the south side most of the year, the laundries and store rooms may be provided on that side. Light from North - evenly Distributed the Studios, reading rooms and class rooms are laid out with north aspect.

Aspects of different rooms of residential building are shown below.

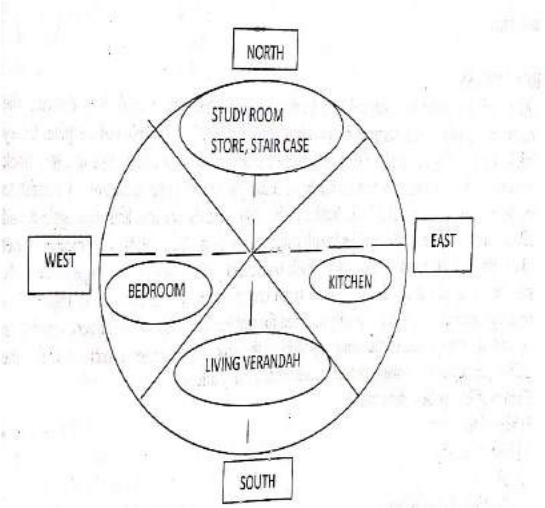

Fig 2 Aspects of Room

Table: 1

Room	Recommended Aspect	Influence Factor
Bed	NW-W-SE	To induce plentiful of Breeze in summer
Kitchen	E-NE	To receive morning sun which is germicidal, if purifier the air it should be cool during summer
Dinning	SE-S-SW	Proximity of Kitchen, it should be cool
Drawing	SE-S-SW-W	Adequate natural lighting during winter and obviate the sun during summer
Reading	N-NW	Light from north being diffused and evenly distributed
Store	NW-N-NE	Dark and cool

4. PROSPECT

Prospect is the view from outside of a house. The house should have a proper prospect so that it can give a feeling of cheerfulness to the people living in it. It is to enrich the outside view i.e., elevation view created by prominently exposing the better constructed and better looking portions and at the same time concealing the view from any undesirable once, It should create a good impression on a person who views it from outside. Prospect should reveal pleasant features and hide unpleasant and undesirable features of the house. Prospect must not only make outer appearance attractive, but side by side also maintain qualities such as comfort, security. The outside appearance can be improved by attractive planning and utilization of good landscape.

5. ROOMINESS

The roominess could be produced in a house by using small proportions. It is deriving the maximum benefit from minimum dimension of the room without cramping of the plan. Every unit in the building is matter of cost, so we must take the maximum advantage of every nook and corner. A square room is less useful than a rectangular room of the same area. A breadth to length ratio of 1:1,2 to 1:1.5 is desirable. If the ratio exceeds one and half then again a bad effect is created. A room having its length twice the width is objectionable as it creates tunnel like feeling. Small room should not be made unnecessary high. Such rooms appear relatively smaller. The size and shape of certain room create desirable and undesirable impressions regards roominess. Skill is essentially required for making use of the available accommodation by suitable arrangement of the rooms, by locating the doors and passages in such a way that the utility, privacy and external appearance, are not adversely affected.

Factors affecting the roominess are

- Size of the room

- Furniture used
- Shape
- Position of door window

6. FURNITURE REQUIREMENT

Furniture is the functional requirement of a room. Drawing room, living room, kitchen Laboratory room, office roam, a class room etc. all has their own requirements. There is no Hard and fast rule so as to decide the furniture requirements for a particular room, but it should be adequate to accommodate the normal needs of maximum number of persons who can use a Dwelling without overcrowding. It is better to prepare a sketch plan indicating furniture Position, so that it can made sure that doors, windows and circulation space do not preclude the Placing of a sufficient number of pieces.

7. GROUPING

The various rooms in a building should be arranged in proper sequence and correlation for easy and proper movements of occupants. Grouping minimizes the circulation and at the same time improves the comfort, privacy of the house. Point to be considered

- Veranda adjacent to drawing room
- Dining room close to kitchen
- Bed room, toilet and dressing room grouped together.
- Bath and w/e should be nearer to each other
- Staircase should be easily accessible from all room
- W/C should be away from dinning.

8. CIRCULATION

Access used for getting comfortable communication from one room to another or from one Floor to another is known as circulation. Passages, corridors, halls, lobbies, serve the purpose of Horizontal circulation, whereas stairs serve the purpose of vertical circulation. Circulation Between rooms of the same floor is known as horizontal circulation, whereas circulation among various floors is known as vertical circulation. Area of horizontal circulation may be consists of 20% to 25% of the total building area. Area of Vertical circulation is about 8% to 10% of total area. Passages, corridors, halls, etc. used for horizontal circulation should be independent, short, and Straight and should not invade the privacy of any room. Circulation should neither affect the Privacy of a room nor interfere with the utility of space. Points The following points should be planning the circulation areas:

- They should be straight.
- They should be sufficient.
- They should be well lighted and ventilated.
- Stairs should be easily accessible to all users.

9. PRIVACY

Unless an optimum privacy is secured, all the principles of planning of a building are bound to fail, particularly in case of residential buildings. Privacy may be from one part to another of the same buildings or it may be privacy as a whole from neighbouring buildings, public streets or by Ways. Privacy is broadly classified as:

i) Internal privacy: The internal privacy can be achieved by providing lobbies or screens, all these services should be independent for every bedroom without disturbing the others. The privacy depends on fixing the position of doors. Internal privacy is the privacy within the building. It can be easily achieved by:

- Proper grouping of rooms.
- Careful planning of entrance and circulation space.
- Better disposition of doors and windows.
- Provision of small corridor or lobby.

ii) External privacy- External privacy is the privacy of the whole building with reference to the surrounding building and roads, it can be achieved by:

- Having a compound wall to a height of 1.35m to 1.50m.
- Fixing screens on the door and windows of the house so that one

cannot have a full view of the internal parts of the house from outside.

- Planting trees along the compound wall which acts as sound barriers and sight barriers as well.
- If the house is built at the backside of the plot with enough distance from the highway and streets, then privacy can be maintained easily. The house should not be built at the edge of the road.

10. SANITATION

The health of the family members depends upon the sanitary condition of the house. Provision should be made for proper lighting, ventilation, cleanliness and other sanitary conveniences in the house. All the rooms should be well lighted and well ventilated. There should be windows on opposite wall of the room to have cross ventilation. Instead of one window, there should be two or three windows in different walls of the rooms so that all the rooms can get sufficient light and air. Factors influence sanitation is

- Lighting
- Ventilation
- Cleanliness

11. ECONOMIY

Building should have minimum floor area with maximum utility. It should not exceed at the cost of strength. Only with proper planning and utility of space being maximized. It can achieved by

- Simple elevation
- Reducing storey height
- Reducing number of steps of stair
- Standardization of size of various components and materials
- Dispensing of balconies, lobbies

12. FLEXIBILITY

It means that the room can have multi-purpose use. When there is shortage of space, flexibility of room becomes important. Flexibility means planning the rooms in such a way which though originally designed for a specific purpose, may be used for other purposes also as and when desired. For e.g. a living room can be converted to bedroom at night when needed. Flexibility is important for those who live in flats.

- It is ease with which a room designated for a particular activity can accommodated more load temporarily or may supplement of another room.
- As drawing room used as guest bed room.
- Kitchen as additional dining room.

13. ELEGANCE

It is grand appearance of the building. Mainly owing to the elevation which in turn depends on plan is known as elegance. It depends on Elevated site, Architecture, Neighbourhood, Adjoining building and relative placement A better elegance can be obtained by

- Superior building material for facing- like paint, glass, timber, polished stones- granite, marble, mosaic etc.
- Providing projection- like sun shades, balconies etc.
- Providing bay windows, corner windows etc.

14. PRACTICAL CONSIDERATIONS

Practical consideration plays an important role while constructing a house. The ease of cleaning and maintenance should be kept in mind while finishes are decided for floors and walls. Smooth and unbroken surfaces can be cleaned easily than the decorative pieces. The immediate surroundings of the house should be carefully considered. These are garden, courtyard or backyard. The garden around the house is important to beautify the house. In planning a house, the needs of the family members must be taken into consideration. Besides all the fundamentals of planning discussed, following practical points should be additionally considered:

- The building should be strong and capable to withstand the likely adverse effects of natural agencies.
- Provisions for future extensions without dismantling should be made in the planning.

- Strength, stability, convenience and comfort of the occupants, should be the first consideration in planning.
- As far as possible sizes of rooms should be kept large. Large room can be shortened by
- Providing movable partitions but small rooms cannot be enlarged easily.
- Elevation should be simple but attractive. Too many porches may give good elevation for
- Some time, but ultimately simple designs fit better for generations.
- Amalgamation:-combining two or more plot as a single plot.
- Amenities: - Means roads, open space, parks, garden, water supply, electric supply, lighting and drainage.
- Bifurcation: - Means bifurcation of a plot into two.
- Building line: - mean the line up to which the plinth of a building may lawfully extend within the plot on a street or an extension of a street. No overhead projections are allowed beyond the building line.
- Frontage: - Frontage means the width of the site abutting the access road.
- Building setback: - minimum distance between any building and any structure from the boundary line of the plot.
- Carpet Area:-As its name suggests, carpet area is the area where we can spread a carpet, Means are calculated from inner wall to wall distance inside the house. So essentially, carpet area is nothing but the net usable area inside the house. It is 50 to 60% of the plinth area.
- Floor area ratio: - Abbreviation of the whole words "F.A.R". Means the quotient obtained by dividing the total area on all floors of a building by the area of the plot

CONCLUSION

Functional requirements are to be taken into account for efficient planning of an block. The time spent for this purpose is really worthwhile from the point of view of the correct approach to planning and construction. While planning a building, the principles of planning are considered in close association with the theoretical and practical aspects. All the principles may not be rigidly possible to adopt and there should be some scope of flexibility. Sustainable building is considered as a way for the building industry to move towards protecting the environment. The promotion of sustainable building practices is to pursue a balance among economic, social, and environmental performance in implementing construction projects. If we accept this, the link between sustainable development and construction becomes clear; construction is of high economic significance and has strong environmental and social impacts. With the growing awareness on environmental protection, this issue has gained wider attention from construction practitioners worldwide. Implementing sustainable building construction practices has been advocated as a way forward in fostering economic advancement in the building industry while minimizing impact on the environment. In order to reduce these detrimental impacts of construction on the environment and to achieve sustainability in the industry, three principles emerge: resource efficiency, cost efficiency and design for human adaptation. They form framework for integrating sustainability principles into construction projects right from the conceptual stage. The framework has considerable potential to accelerate the understanding and implementation of sustainability in building construction. It provides a brief overview of sustainability principles, strategies and methods, and emphasizes the need for an integrated and holistic approach for implementing sustainability in building projects. It is intended to provide a general framework for improving the quality and comparability

of methods for assessing the environmental performance of buildings. It identifies and describes issues to be taken into account when using methods for the assessment of environmental performance for new or existing building properties in the design, construction, operation, refurbishment and deconstruction stages. It is not an assessment system in itself but is intended to be used in conjunction with, and complimentary to existing assessment systems such as BREEAM, BEES, LEED, etc. These sustainability requirements will be applicable throughout the different stages of the building life cycle, from its design, during its useful life, up until management of the building waste in the demolition stage. This framework lays the groundwork for the development of a decision support tool to help improve the decision making process in implementing sustainability in building projects. The full decision support tool will be described in the model currently being developed for use in the UK building industry.

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DIGITAL BANKING IN INDIA: THE WAY AHEAD

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Abstract

The banking sector is the backbone of every economy. It plans and implements the economic reforms and all other sectors are largely depends on it. Any small change in that particular sector has a large impact on all over the economy. By digitalisation of banking system through the adoption of technology have an extensive impact on the growth of an economy. Nowadays, banks are seeking unconventional ways to provide and differentiate amongst their diverse services. Both corporate as well as retail customers are no longer willing to queue in banks for the basic banking services. They want a facility to conduct banking activities at any time and any place. Unified Payments Interface (UPI), Plastic money (Credit Cards, Debit Cards and Smart Cards), Point of Sale, electronic fund transfer and clearing services, online trading accounts, telephone banking, Internet Banking, Immediate Payment Service (IMPS), Mobile Banking are some of the recent products offered by the bank. Digital Banking system will reduce cash related robbery thereby reducing risk of carrying cash and cash related corruption. That reforms helps in modernization of payment system, Reduction in high security and safety risk, Reduction in the cost of banking service and also curb banking related corruption. The proposed study focuses on the emergence of digital banking system in Indian economy and digital banking trends in India and also try to find out the opportunities and challenges of going digital in the Indian banking sector.

Keywords: *Digital Banking, Demonetisation, Information Technology, Financial Literacy, Cyber Security.*

I. Introduction

Digital Banking is a generic term for delivery of banking/ financial services and products through electronic channels, such as the Automated Teller Machines (ATMs), the telephone, the internet, the social media, the mobile phone, etc. The banking industry in India is progressively expanding. The liberalization of the economy has created a competitive culture that has taken the service sector, particularly the banking sector by storm. The banking sector has been the backbone of every emerging economy. It plans and implements the economic reforms. Any change in this sector through the adoption of technology will have a sweeping impact on an economies growth. The

advancement of information collection, storage, processing and transmission technologies have impacted all aspects of the banking activity.

The post liberalization competitive culture in India has forced all banks realize that in order to remain competitive and provide the most excellent services to their customers, they need to encompass the most recent technology in place. This cutting-edge competition, rapid changes in technology and the hectic lifestyles have changed the facade of banking. Nowadays, banks are seeking unconventional ways to provide and differentiate amongst their diverse services. Both corporate as well as retail customers are no longer willing to queue in banks, or wait on the phone, for the basic banking services. They require and expect a facility to conduct their banking activities at any time and place. Irrespective of being a public sector or private sector bank, almost all of them have given maximum significance to technological development and deployment. To illustrate, ATMs, plastic money (Credit Cards, Debit Cards and Smart Cards), online collection and payment services, online investments (Deposits and Mutual Funds), online De-mat and Trading accounts, Electronic Funds Transfer (ETF) and clearing services, branch networking, telephone banking, mobile applications and wallet, and internet banking are the outcomes of their initiative towards technological up gradation.

II. Literature Review:

Mr. Vijay Prakash Gupta & Dr. P. K. Agarwal (2013) - In their research paper "Comparative Study of Customer Satisfaction in Public Sector and Private Sector Banks in India". This paper gives with the introduction of liberalization policy and RBI's easy norms several private and foreign banks have entered in Indian banking sector which has given birth to cut throat competition amongst banks for acquiring large customer base and market share. Banks have to deal with many customers and render various types of services to its customers and if the customers are not satisfied with the services provided by the banks then they will defect which will impact economy as a whole since banking system plays an important role in the economy of a country, also it is very costly and difficult to recover a dissatisfied customer.

Vijay M. Kumbhar (2011)- In his research paper "Factors Affecting the Customer satisfaction In E-Banking: Some evidences Form Indian Banks". This study evaluates major factors (i.e. service quality, brand perception and perceived value) affecting on customers' satisfaction in e-banking service settings. This study also evaluates influence of service quality on brand perception, perceived value and satisfaction in e-banking

Pooja Malhotra & Balwinder SINGH (2009) - In their research paper "The Impact of Internet Banking on Bank Performance and Risk: The Indian Experience". The paper describes the current state of Internet banking in India and discusses its implications for the Indian banking industry. Particularly, it seeks to examine the impact of Internet banking on banks' performance and risk. Using information drawn from the survey of 85 scheduled commercial bank's websites, during the period of June 2007, the results show that nearly 57 percent of the Indian commercial banks are providing transactional Internet banking services

Rathee (2017) says that revolutionary technological transformation that includes the features like anytime anywhere banking, ultra-fast response time, the usage of digital channels by avoiding or bringing down the paper-based transactions has changed the face of Indian banks.

Yadav (2017) highlights that digitalization is enhancing customer experience and making it easy for the customer to do business with the Bank and vice-versa, by effective use of technology.

Golani (2017) says that the banking and financial services sector in India has undergone through disruptive changes in the last decade as far as adoption of technology is concerned. With the government providing incentives for digitalization of the economy, it is definitely the success mantra for the banks.

Malhotra and Singh (2010) conducted an exploratory study and make effort to present the current status of Internet banking in India and the extent of Internet banking services offered by Internet banks.

III. Objective of the Study:

The objective of the proposed study are as follows:-

- The concept &Evolution of Digital Banking in India
- Trends and Innovations in Digital Banking
- Opportunities and Challenges faced by the users of Digital Banking services

IV. Research Methodology & Data Source

The proposed study is descriptive and exploratory in nature and is based on secondary information sources collected from various research papers, repute journals and magazines, University of Calcutta library, various annual report published by Government of India & Reserve Bank of India, and other related websites to this matter.

V. The Concept of Digital Banking

Digital Banking means any user with a personal computer and a browser can get connected to his bank's website or mobile application to perform any of the virtual banking functions. Digital banking is the term that signifies and encompasses the entire sphere of technology initiatives that have taken place in the banking industry. E-banking is a generic term making use of electronic channels through telephone, mobile phones, internet etc. for delivery of banking services and products. The concept and scope of e-banking is still in the transitional stage. E-banking has broken the barriers of branch banking.

The term "Digital Banking" covers computer and mobile / telephone banking. The system is updated immediately after every transaction automatically. In other words it is said that it is updated "on-line, real time." The system is updated immediately after every transaction automatically. Digital banking is further defined as delivery of banking products and services to customers through electronic channels. It does not involve any physical exchange of money as all transactions are done electronically from one account to another through internet. Digital banking includes the systems that enable financial institution customers, individuals or businesses to access accounts any time and from any part of world and do so when you have time and not when the bank is open.

Digital Banking is also known as Electronic Banking, Cyber Banking, Home Banking, or Virtual Banking and includes various banking activities that can be conducted from anywhere. A perusal of the concept of e-banking as described in the literature reveals that the term e-banking, is an upper construct that encompasses an array of banking services delivered through electronic media, be it through phone, PC, TV or internet. Thus the term E-banking includes RTGS, NEFT, ECS, Credit cards and debit cards, Cheque truncation, ATM, Tele banking, Internet banking and Mobile banking.

VI. Evolution of Digital Banking in India – Major Landmarks

The traditional system of banking in India has been the branch banking. The Magnetic Ink Character Recognition (MICR) based cheque processing was introduced during the period 1986-88.

The late eighties marked the emergence of computerisation of banks‟ branches with the introduction of Ledger Posting Machines (LPMs), Advanced Ledger Posting Machines (ALPMs), followed by network based systems and the latest core banking solutions. Computerisation of Government industry from the late nineties in turn facilitated the computerization of all banks branches handling Government business. The Institute for Development and Research in Banking Technology (IDRBT) was set up at Hyderabad as a centre for research and technology in the banking sector. The Indian financial system was commissioned as a closed user group based network in 1991 with state-of-the-art safety and security, for the use of the banking sector exclusively. IDRBT commenced its Certification Authority (CA) functions for ensuring the requisite legal protection for the electronic banking transactions under the Information Technology Act, 2000. Formulation of Information Systems Audit (IS Audit) guidelines for ensuring such audit in the banks and establishment of National Financial Switch (NFS) for inter-connectivity of shared ATMs and to facilitate payment settlement across banks. This is now managed by National Payments Corporation of India (NPCI). Implementation of the Electronic Payment and Settlement Systems (EPSS), Negotiated Dealing System (NDS), Centralised Funds Management System (CFMS) etc. [24]. The recent Digital India program was initiated in 2017, with the objective to provide high speed internet, mobile and bank accounts, in order to enable participation in digital and financial space at individual level.

Table 1
Technological Milestone in Indian Banks

Sl. No.	1980	1990	2000-2010	2011-2019
1	MICR	ATMs	IMPS	Bio Metrics
2	Standard Cheques	Electronic Funds Transfer	RTGS	Mobile Banking
3	Encoders	Branch Connectivity	NEFT	Cheque Truncation
4	-	Computerization	NECS	UPI
5	-	-	Online Banking	USSD
6			Tele Banking	E-Wallet

VII. Demonetisation Effect

The story of digital transformation of Indian economy is incomplete without a chapter on demonetization. 8th November 2016 was an eventful day not only for the Indian economy, but for the whole of India. The central government took a very bold step which led to withdrawal of 86 percent of Indian currency. There was an immediate ban on highest denomination bills of Rs 500 and Rs 1000. Due to this sudden move, there was immediate shortage of cash in the market. As a result retail sales went down, wholesale markets tumbled. Indian economy is one of the largest economies in the world. But there are millions of businesses and hundreds

of millions of people having either no access to banks or don't have bank accounts. These businesses use cash for their day to day dealings and the individuals need cash to pay for everything from groceries to hospital stays to land purchases. Then there is a shadow economy which exists alongside the main economy comprising of countless hidden transactions, which are almost impossible to trace. This shadow economy, which is believed to be about a quarter of the country's Gross Domestic Product, operates in cash. The current demonetization exercise is not the first one in India. A similar attempt was made in 1970s to curb the corruption, but eventually it failed in its purpose. Since then, the shadow economy or the underground economy has grown immensely. The main objective behind the whole demonetization exercise was to curb the menace of black money and weeding out the counterfeit currencies out of circulation. However, it went out to serve another useful purpose. It pushed people towards digital money as they searched for alternatives of cash. The government set a target of Rs. 25 billion cashless transactions for the fiscal year ending March 2018. According to a report, by the end of March 2018 digital initiatives such as digital wallet payments, electronic toll payments, Aadhaar-based and bank-to-bank electronic money transfers accounted for about Rs. 20 billion worth of transactions, but fell short of the target. The performance of private sector banks was better than the public sector banks primarily on account of the concentration of their operations in urban areas. Even though the target was not achieved, the standalone figures indicate that the achievement is commendable.

VIII. Need for Digital Banking in India

1. **Customer Service:**
   With internet freely available everywhere, all a customer needs to access his account is a device & internet Connectivity. It saves time & expenses as he no longer has to travel to a bank to carry out transaction. Online services make it possible for him to sit in the comfort of his home or office, or in fact even in a vehicle while travelling, & carry out transaction without having to wait for anything.
2. **24*7 Availability**
   The customer is able to check his bank records anytime he wishes & a number of banking services are available to him round the clock. Transferring money is easier, quicker & safer.
3. **Time Constraint**
   A number of services required waiting for considerable periods. Banks had boards put up at their branches specifying the time required for different services. Even simply cashing a cheque took time. But digital Banking is instant, with no time constraint.
4. **Online Bill payments:**
   This is a feature that saves customers a lot of time & expenses. Customers do not have to carry cash & queue up to pay their utility bills or other bills.
5. **Lower Overheads:**
   Digital Banking has drastically reduced the operating costs of banks. This has made it possible for banks to charge lower fees for services & also offer higher interest rates for deposits. Lower operating costs have meant more profits for the banks.
6. **Banking Benefits:**
   With the increased convenience of anytime, anywhere banking, the number of customer has increased for banks. Human error in calculations & record keeping is reduced, if not eliminated. With records of every transaction being maintained electronically, it is possible to generate reports &

analyze data at any point, & for different purpose.

IX. Digital mode of Transaction:

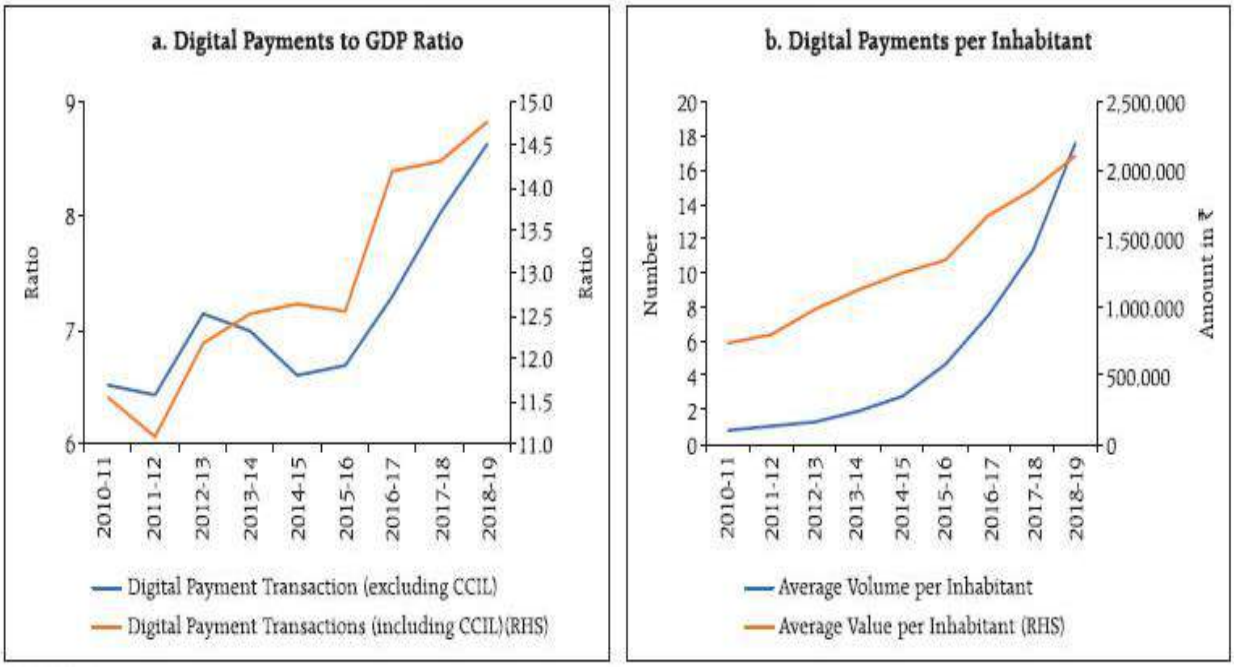
To build a successful cashless economy the Government of India introduce a large number of alternatives for digital transactions. Which are enumerated below –

1. Banking cards
2. Aadhaar Enabled Payment System (AEPS)
3. MICRO ATMS
4. Unified Payments Interface (UPI)
5. Mobile Wallets
6. Banks Pre-Paid Cards
7. Point of Sale
8. Internet Banking
9. National Electronic Fund Transfer (NEFT)
10. Real Time Gross Settlement (RTGS)
11. Immediate Payment Service (IMPS)

Mobile Banking

X. Digital Banking Trends in India

Chart 1
Digital Payments in India

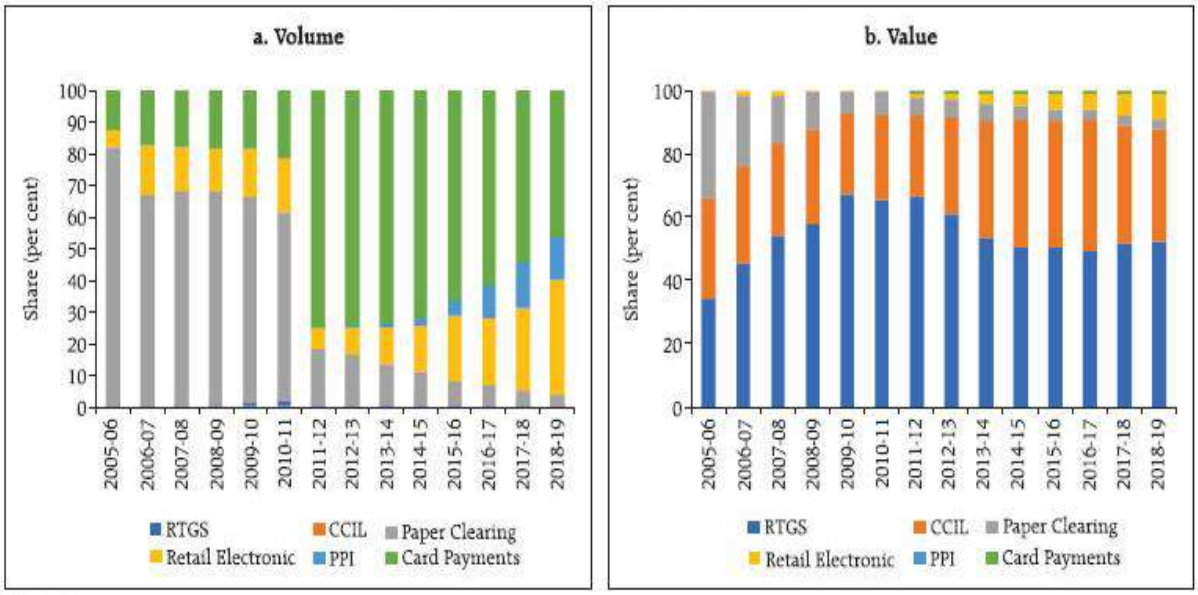


Source: RBI (www.rbi.org.in)

Digital payments to GDP ratio in India has been traditionally low, in the last few years.Although it has increase significantly with the introduction and promotion of various cashless payments instruments which have resulted in a significant increase in digital payment transactions and that change taken place especially after demonetisation on 2016-17(Chart 1a).

Chart 1(b) depicts that the per person digital payments, both in terms of value and volume, also increased significantly. The share of retail electronic payments in total payments in terms of both volume and value is consistently rising since 2011-12 and reach high in 2018-19. This increase may be due to the introduction of some new modes of retail payments such as Prepaid Payment Instruments (PPI), Unified Payments Interface (UPI) etc.

Chart 2
Digital Payment system Indicators



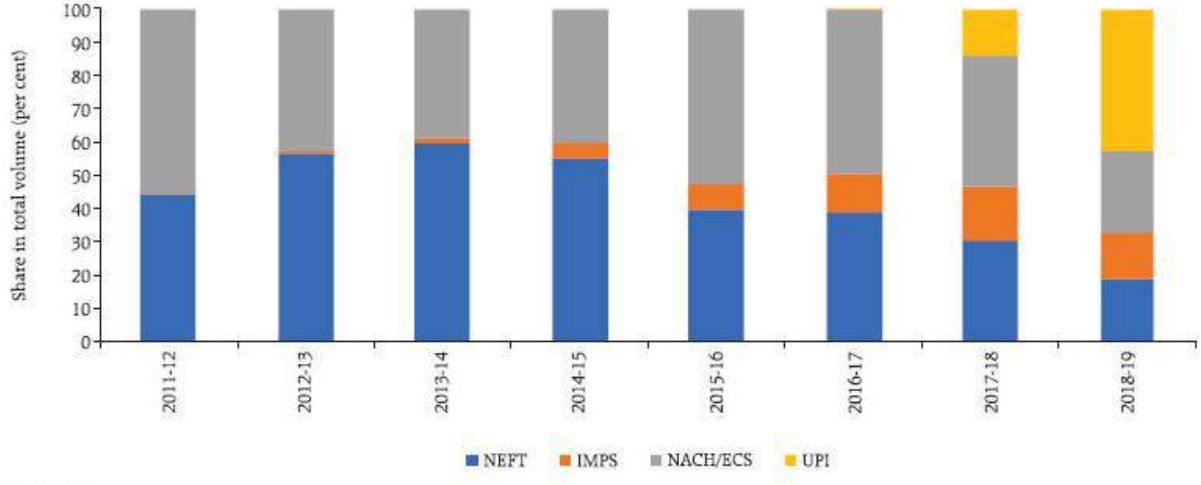
Source: RBI (www.rbi.org.in)

Chart 4 depicts that, the share of card payments in terms of volume has been declining, although it continues to be the most important component.Card payments increase hugely from 2011-12 but starts to continuous declining from 2015-16. This may be happen due to the switching of customers to other innovative digital payment mode of transactions. Share of retail electronic decline in 2011-12 but after that it starts increasing and takes a good position in 2018-19.

In terms of value, highest transactions taken place in payments through Real Time Gross Settlement (RTGS). Here, RTGS and Clearing Corporation of India Ltd. (CCIL) dominate the digital transaction system. The share of paper clearing is in a declining trend, both in terms of volume and value during and its existence is very narrow in 2018-19.

Chart 3

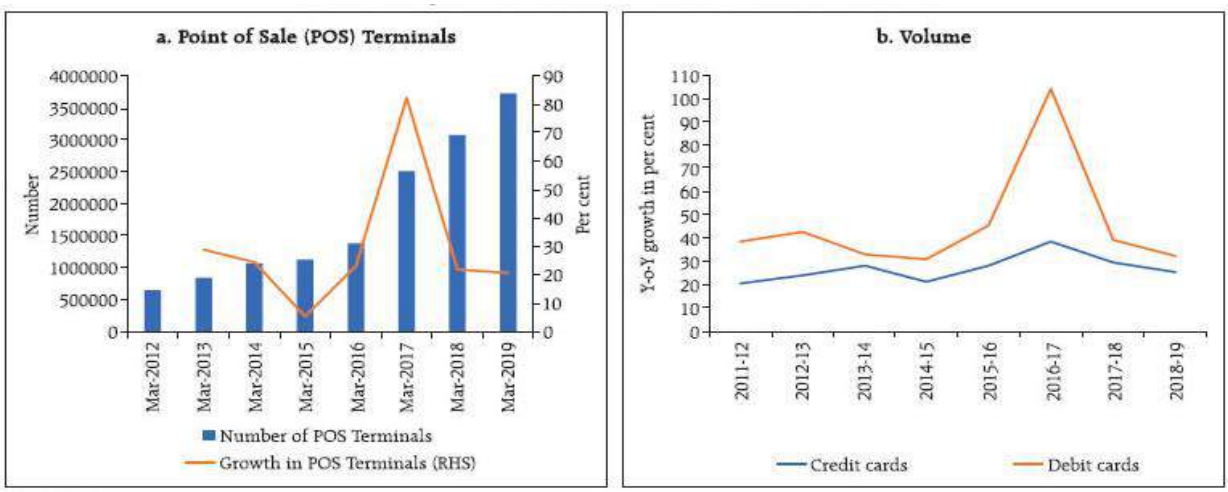
Retail Electronic Payment



Source: RBI (www.rbi.org.in)

Above chart depicts that, retail electronic payment system has been dominated by NEFT upto 2014-15. The introduction of UPI in 2016-17 changed the landscape of retail electronic payment system. The UPI's share in it increased to 43 per cent within a span of three years. NACH/ECS has also plays a big role in digital payment system.

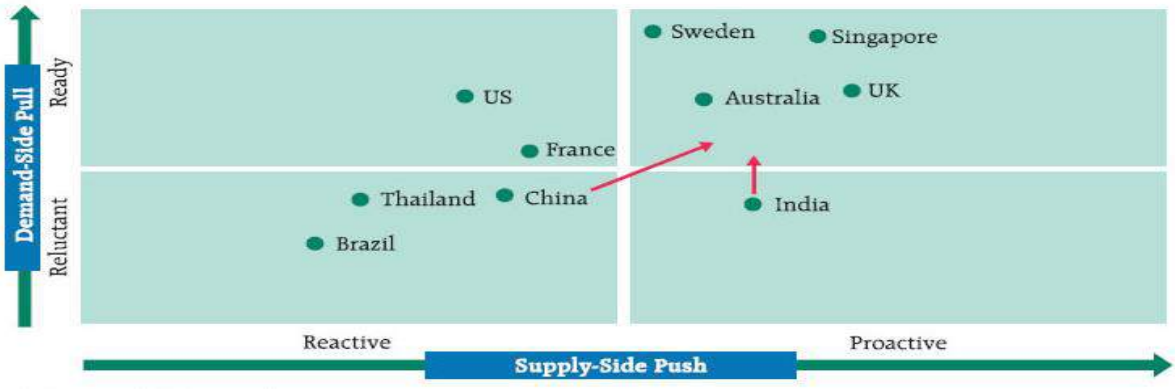
Chart 4
Usage of Debit and Credit cards at POS Terminals



Source: RBI (www.rbi.org.in)

Chart 4 depicts that, on account of demonetisation the number of POS terminals and usage of debit and credit cards increased significantly during 2016-17. Though growth in usage of debit and credit cards at POS terminals declined in the post-demonetisation period.The usage of debit cards at point of sale (POS) terminals has witnessed a sharp rising in the recent years. In terms of volume, their share rose near 110% in 2016-17 but end with 31% in 2018-19. In case of growth in usage at POS terminals debit cards has generally been higher than that of credit cards. The tremendous growth in use of debit cards may be due to the push provided through the RuPay cards under the Pradhan Mantri Jan Dhan Yojana (PMJDY), increase in the number of POS terminals and various incentives provided by the Government of India and the merchants for digital payments.

Chart 5
Demand side and supply side factors affecting digital payments



Source: RBI (www.rbi.org.in)

The wider adoption of digital payments depends on both the supply side push and demand side push. supply side factors consist of robust payments system infrastructure, minimum cost of e-payments, push to greater financial literacy and bank accounts, introduction of new and innovative schemes to attract consumers. On the other hand demand side factors are strong consumer demand for e-payments, safety, add-on benefits etc. The World Payments Report, 2018 shows that the UK, Australia, Singapore and Sweden are the leaders in terms of both regulatory supply-side push and demand-side pull. In India, people are not so much connected with the digital transaction. In spite of sound proactive supply side push, due to insufficiency in demand side pull India does not belong a good position in digital payment system. The government and the Reserve Bank have taken various initiatives which have helped in popularising and inculcating the habit of digital payments. Initiatives such as UPI, PPI, significant expansion in access to RuPay debit card through Jan-Dhan Accounts and Aadhar based direct benefit transfers (DBTs) have helped in popularising and increasing the usage and penetration of digital payment system. The Reserve Bank's 'Payment and Settlement Systems in India: Vision 2019-2021' endeavours to ensure increased efficiency, uninterrupted availability of safe, secure, accessible and affordable payment system as also to serve segments of the population which are hitherto untouched by the payment system.

Chart 6
Cross- Country spread of Digital Banking

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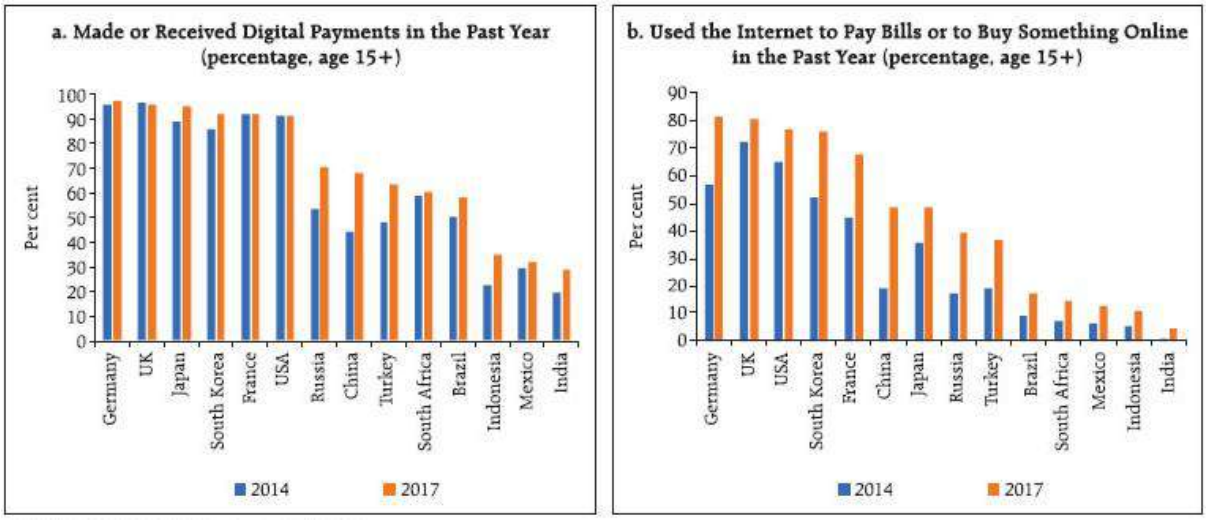

Source: RBI (www.rbi.org.in)

Although government of India have taken various initiatives for increasing the usage and penetration of digital payments system, the usage of digital medium remains much lower than major advanced and emerging economies. In terms of various indicators of payment system infrastructure and usage such as number of cards per inhabitant, number of cashless payments per inhabitant and value of cashless payments per inhabitant, India lags behind the AEs and other EMEs. Above Chart depicts that Germany, UK and Japan are the top three countries in respect of made or received digital payments in the past few years

(Chart 6a). Germany, UK, USA and South Korea are dominates on used the internet to pay bills or to buy something online in the past years (Chart 6b).

XI. Hurdles in Digital Banking system

1. Internet Penetration: As per a report titled "Internet in India 2017" by Internet and Mobile Association of India (IAMAI) and Kantar IMRB, the number of Internet users stood at 481 million in December 2017, which is second highest in the world. Urban India with an estimated population of 455 million has 295 million internet users whereas rural India, with an estimated population of 918 million as per 2011 census, has only 186 million internet users leaving out potential 732 million users in rural India. This indicates a very low internet penetration, which is a major obstacle in the path of digital banking.

2. Internet Shutdowns: Internet shutdowns are one of the major hindrances in seamless connectivity which is required for digital banking. In the current year, India has already witnessed 95 internet shutdowns as against 79 such cases in the whole year of 2017, as per the data compiled by Software Freedom Law Centre (SFLC), a legal services organization. Although the problem of shutdown exists across many states, Jammu & Kashmir and Rajasthan are leading states. Frequent internet shutdowns result in serious disruptions and tremendous loss to individuals and businesses, and may prevent the nation from realizing the benefits of digital economy.

3. Inadequate Infrastructure India is having the highest number of bank branches in the world, but people in rural areas still have to travel miles to access banking interface. Although India is a huge country, it has only 2.3 lakh ATMs and 14 lakh Point of Sale (PoS) terminals. Though digital channels like apps, websites, SMS/Text, ATM, video teller machines (VTMs) and e-kiosks are narrowing the gap between banks and customers, rural Indians are more comfortable with physical cannels. A 2015 Ernst and Young report said there were only 693 machines per million of India's population, compared to similar emerging countries such as Brazil, which has 32,995 terminals per million people and China and Russia, each of which has around 4000 terminals per million people. Number of ATMs per million population has been growing in almost every country. There are countries with 1,000-plus ATMs per million population — South Korea (2423 ATMs), Canada (1859), France (1745), Russia (1537) and Australia (1338) — while the number is 180 for India, which is lower than China (538) and South Africa (516).

4. Financial Literacy: A survey was conducted by Standard & Poor's Financial Services LLc, where it was found that 76 percent of Indian adults are unable to understand key financial concepts, which is seven percentile points lower than the worldwide index. With better financial literacy will help these individuals in the selection of products that best suits their requirements. A financially aware individual is more likely to adopt the digital banking services and channels.

5. Cyber Crime and Security: Digital banking has brought in comfort, convenience and flexibility in banking services. The flip side is that it has increased the risk of cybercrimes. Most banking and financial applications are subject to cyber-attacks. With so much money at stake, there is always a risk involved. There are hackers who employ innovative techniques to siphon funds, either as large amounts in a single shot, or minuscule amounts from hundreds and thousands of accounts, over a long period of time. Also, there is always the threat of valuable personal data being compromised. Banks need to ensure that their system is well maintained and upgraded to counter any threats from cybercrimes.

XII. Conclusion:

There is no doubt that the Banking Sector in India has become more competitive with the advent of digitization and the Digital India Program for ensuring better customer service, thereby attaining the goal of a cash-less economy. From the study it can be concluded that the digital innovations are creating a new picture of banking services all together. The digitization in banking has started shifting the paradigm of cash and paper based banking to cashless and paperless banking. However, there is still a long way to cover by encountering the challenges with possible solutions and encashing the available opportunities.

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IMMENSE ENFORCEMENT CONCRETE AND ITS APPLICATIONS IN THE FIELD OF CONSTRUCTION

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Abstract

Concrete as a construction material is widely used in India with annual consumption exceeding 100 million cubic meters. Conventional Ordinary Concrete which is designed on the basis of compressive strength does not meet many functional requirements since it is found deficit in aggressive environments conditions, time of construction, energy absorption capacity, repair and retrofitting jobs etc. So, there is a need to design High Performance Concrete (HPC) which is far superior than conventional concrete. High Performance Concrete exceeds the properties and constructability of normal concrete. These specially designed concretes are made up of normal & special materials which enable it to meets the general performance requirements in a particular structure. Special mixing, placing, and curing methodologies may be required in order to produce such type of concrete. When the general performance of concrete is substantially higher than that of normal type concrete, such concrete is regarded as high performance concrete. High-performance concrete has been primarily used in the construction of tunnels, bridges, pavements, high rise building structures because of its strength, durability, and high modulus of elasticity. High Performance Concrete has received increased attention in the development of infrastructure such as buildings, industrial structures, hydraulic structures, bridges, highways etc. leading to utilization of large quantity of concrete. This paper presents the general introduction of high performance concrete, its categorization, its composition and its applications in various civil engineering constructions.

Keywords: *High-Performance Concrete, Categorization of High-Performance Concrete, Materials Used in High- Performance Concrete, Applications of High-Performance Concrete*

INTRODUCTION

The rapid development of building and civil engineering after the second world war is characterised by wide application of concrete as the basic material in all branches of the economy **(A. Kmita, 2000).** New types of structures and new technologies in building created more difficult requirements for this material. So in order to meet the requirements a special form of concrete is formed known as High-Performance Concrete (HPC). A High Performance Concrete is a concrete in

which certain characteristics are developed for a particular application and environment so that it will give excellent performance in the structure in which it will be placed, in the environment to which it will be exposed, and with the loads to which it will be subjected during its design life **(Vatsal Patel & Neeraj Shah, 2013)**. High Performance Concrete is also defined as concrete which meets special performance and uniformity requirements that cannot be always achieved routinely by using conventional materials and normal mixing, placing and curing practices **(Vatsal Patel & Neeraj Shah, 2013).** American Concrete Institute (ACI) defined High Performance Concrete as a concrete which meets combinations of performance and uniformity requirements that cannot be achieved routinely using conventional constituents and normal mixing, placing, and curing practices.

In recent years, further improvements in concrete properties have been achieved in the so called High Performance Concrete by improvements involving a combination of improved compaction, improved paste characteristics, aggregate-matrix bond and reduced porosity **(M.L.Gambhir, 2014).** Although high- performance concretes are made with the same basic components as the normal concrete, their much higher qualitative and quantitative performances make them new materials. On the basis of their use, they offer different advantages such as enhanced durability, reduced permeability, higher strength etc. at an economical cost.

The strategic Highway Research Programmer (SHRP) has defined a High Performance Concrete as concrete meeting one of the following requirements:

(a) 4 hours compressive strength greater than or equal to 17.5 N/mm2,

(b) 24 hours compressive strength greater than or equal to 35 N/mm2,

(c) 28 days compressive strength greater than or equal to 70 N/mm2,

(d) Water-cement (W/C) ratio less than or equal to 0.

Fig.1 High-performance concrete used in flyovers

Fig.2 High-performance concrete used in tall building structure

Admixtures play an important role in the production of High Performance Concrete. Mineral Admixtures form an essential part of the High-Performance Concrete mix. They are used for various purposes depending upon their properties. Table-1 shows different types of mineral ad- mixtures with their particle characteristics.

Table 1

Mineral Admixtures used in High-Performance Concrete (HPC)

Mineral Admixtures	Classification	Characteristics
Ground granulated blast furnace slag	Cementitiou And pozzolanic	Unprocessed materials are grain like sand, ground to size less than 45 μm.
Fly ash	Cementitiou And pozzolanic	Powder consists of particles size less than 45 μm.
Silica fume	Highly active pozzolana	Fine powder consisting of solid spheres of 0.1 μm average diameter

2. Categorization of High-Performance Concrete

A suitable classification of HPC according to different levels of performance requirements would enable design engineers to select appropriate performance criteria of HPC for different applications in different environmental conditions (M.L.Gambhir, 2014). The categorization of high-performance concrete is as follows:

2.1 Based on Characteristic Strength: Based on 28-days characteristic strength of concrete, the following classification has been suggested

(a) Ordinary Concrete : Concrete having 28-days compressive strength in the range of 10 to 20 MPa.

(b) Standard/Normal Concrete : Concrete having 28- days compressive strength in the range of 25 to 55 MPa.

(c) High-Performance Concrete : Concrete having 28- days compressive strength in the range of 60 to 100 MPa.

(d) Very High-Performance Concrete : Concrete having 28-days compressive strength in the range of 100 to 150 MPa.

(e) Exceptional Concrete : Concrete having 28-days compressive strength more than 150 MPa.

2.2 Based on Durability and Target Strength: The Strategic Highway Research Programme has defined high-performance concrete into four categories as the concrete with

(a) A maximum water cement ratio of 0.35,

(b) A minimum durability factor of 80 percent,

(c) A minimum strength criterion, &

(d) Fiber Reinforcement

2.3 High Early Strength Concrete: Traditionally, interest in the strength and other properties of concrete has been focused on those at the age of 28 days and beyond. In the recent past, there has been an increasing interest in the properties of concrete at ages less than 28 days. Any strength measured at ages less than the standard 28 days is regarded as early strength (M.L.Gambhir, 2014). In high-performance concrete due to the greater accessibility of cement grain surfaces, the greater early hydration results in up to 24-hours strength of concrete being generally higher than that in the case of normal concrete of same water-cement ratio.

3. Materials Used In High-Performance Concrete

3.1 Cement: The choice of cement for high-strength concrete should not be based only on mortar-cube tests but it should also include tests of compressive strengths of concrete at 28, 56, and 91 days. A cement that yields the highest compressive strength at an extended ages is preferable. For high-strength concrete, a cement should produce a minimum 7-days mortar-cube strength of approximately 30 MPa.

3.2 Aggregates: In high-performance concrete, the size of aggregates, shape, surface texture, mineralogy, and cleanness needs special attention. For each source of aggregate and concrete strength level there is an optimum size aggregate that will yield the compressive strength per unit of cement. To find the

optimum size, trial batches should be made with 19 mm and smaller coarse aggregates and varying cement contents. Many studies have found that 9.5 mm to 12.5 mm nominal maximum size aggregates gives optimum strength.

In high-performance concretes, the strength of the aggregate itself and the bond between the paste and aggregate becomes an important factor. Tests have shown that crushed stone aggregates produce higher compressive strength in concrete than gravel aggregate using the same size aggregate and the same cementing materials content. This is probably due to a superior aggregate-to-paste bond when using rough, angular, crushed material. For specified concrete strengths of 70 MPa or higher, the potential of the aggregates to meet design requirements must be established prior to use.

3.2 Admixtures: Admixtures such as fly ash, silica fume, or slag are often necessary in the production of high-performance concrete. The gain in strength obtained with the addition of these admixtures cannot be attained by using additional cement alone. These admixtures are usually added at dosage rates of 5% to 20% or higher by mass of cementing material. Some specifications only permit use of up to 10% silica fume, unless evidence is available indicating that concrete produced with a larger dosage rate will have satisfactory strength, durability, and volume stability. The water- cement ratio should be adjusted so that equal workability becomes the basis of comparison between trial mixtures.

4. Features of High-Performance Concrete

HPC should have a better performance when compared to normal strength concrete. Basic features of high performance concrete are its strength, ductility and durability. These parameters are the most important features that a construction material should possess from its performance point of view.

4.1 Strength: In practice, concrete with a compressive strength less than 50MPa is regarded as Normal Strength Concrete (NSC), while High Strength Concrete (HSC) may be defined as that having a compressive strength of about 50MPa. Recently, concrete with the compressive strength of more than 200MPa has been achieved (Oral Büyüköztürk and Denvid Lau). Such concrete is defined as ultra high strength concrete. In general, the addition of admixture not only improves the concrete strength but also enhances the aspects of performance, like ductility and durability. Hence, the characteristics of HSC are very similar to those of HPC.

4.2 Ductility: High-Performance Concrete is more brittle as compared to Normal Strength Concrete (NSC), especially when high strength is the main criteria. Ductility in case of high-performance concrete can be improved by applying a confining pressure on HPC.

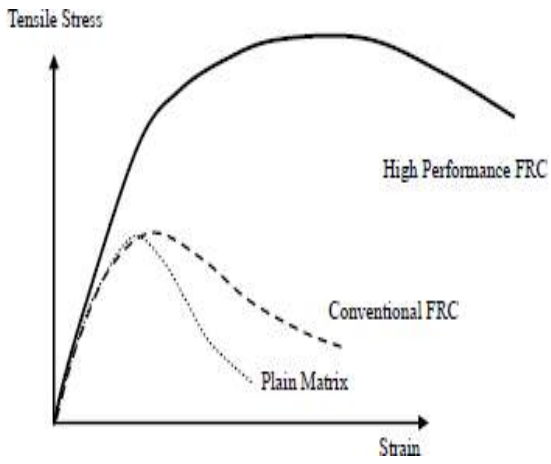

Fig.3 Mechanical Behavior of FRC compared with plain matrix

Besides confinement, the ductility of HPC can be improved by altering its composition through the addition of fibers in the design mix. Concrete with fibers inside is regarded as fiber reinforced concrete (FRC). The mechanical behavior of FRC can be categorized into two classes by their tensile response. The

conventional FRC made by adding fibers in NSC only exhibits an increase in ductility compared with the plain matrix, whereas high performance FRC made by adding fibers in HPC exhibits substantial strain hardening type of response which leads to a large improvement in both strength and toughness compared with the plain matrix. The improvement in terms of ductility, high performance FRC is referred to as ultra ductile concrete as well.

4.3 Durability: Permeability of concrete is a key factor influencing the durability of concrete. Concrete permeability is dependent on permeability of each constituent material and its geometrical arrangement. The permeability of cement paste is primarily related to pore structure, which includes porosity, pore size and connectivity, while pore structure is a function of the water-cement ratio and the degree of hydration. The aggregates have a much lower permeability than cement pastes.

In view of the durability characteristic of high performance concrete, it is proposed that to achieve a durable concrete, three criteria may need to be considered in concrete mix design. The three criteria are strength, permeability and crack resistance. A strength criterion ensures that concrete can resist the design stress without failure. A permeability criterion ensures that concrete has a limited flow penetration rate so as to minimize vulnerability to water and chemical ion attack during the design period of service life. A crack resistance criterion ensures that concrete has a minimum capability to resist the cracking due to environmental conditions, such as thermal and moisture shrinkage (Oral Büyüköztürk and Denvid Lau).

5. Application Areas of High-Performance Concrete

Major applications of high-performance concrete in the field of Civil Engineering constructions have been in the areas of long-span bridges, high-rise buildings or structures, highway pavements, etc. Some of the application areas are discussed in brief below:

5.1 Bridges: The use of high performance concrete would result in smaller loss in pre-stress and consequently larger permissible stress and smaller cross-section being achieved, i.e. it would enable the standard pre-stressed concrete girders to span longer distances or to carry heavier loads. In addition, enhanced durability allow extended service life of the structure. In case of pre- cast girders due to reduced weight the transportation and handling will be economical. Concrete structures are preferable for railway bridges to eliminate noise and vibration problems and minimize the maintenance cost (Dr. R. B. Khadiranaikar).

5.2 High Rise Structures: The reasons for using the high strength concrete in high-rise buildings are to reduce the dead load, the deflection, the vibration and the maintenance cost.

5.3 Highway Pavements: High Performance concrete is being increasingly used for highway pavements due to the potential economic benefits that can be derived from the early strength gain of high performance concrete, its reduced permeability, increased wear or abrasion resistance to steel studded tires and improved freeze-thaw durability. A durable concrete known as fast track concrete designed to give high strength at a very early age without using special materials or techniques has been developed. Fast Track Concrete Paving (FTCP) technology can be used for complete pavement reconstruction, partial replacement by an inlay of at least one lane, strengthening of existing bituminous or concrete pavements by a concrete overlay, rapid maintenance and re-construction processes. The benefits of applying FTCP technology in such applications are : (a) a reduced construction period, (b) early opening of the pavement to traffic, and (c) reducing

the use of expensive concrete paving plant.

Conclusion

1) The paper presents an overview of the concept of high-performance concrete and some of its applications in civil engineering constructions.

2) Although high-performance concretes are made with the same components as of normal concrete, their much higher qualitative and quantitative performances make them new material for usage.

3) On the basis of their use, they offer different advantages such as enhanced durability, reduced permeability, higher strength etc. at an economical cost.

4) The purpose of high-performance concrete is not to produce a high cost product, but simply to provide a means for producing concrete that will perform satisfactorily with reasonable cost for intended service life.

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A REVIEW ON: 3D PRINTING IN PHARMACEUTICAL TECHNOLOGY

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Abstract

The 3D PRINTING technology has paid attention towards medical devices industry and pharmaceutical industry due to its applications on various platforms in health care industry. 3D printing is using computer- aided design to plan fast prototyping. The technology allows easy process drug combinations that are required and tailored dosing. It becomes one of the most new and beneficial tools serving as a technology of good manufacturing of developed dosage forms, tissue engineering and disease modeling. It is a valuable strategy to overcome some challenges of conventional pharmaceutical processes The recent introduction of the first FDA approved 3D-printed drug has fulfilled interest in 3D printing technology, which is set for revolutionize the healthcare.

Keywords: Keywords: *3D printing, Novel drug delivery, personalized medicine.*

INTRODUCTION

3D printing plays an important role in multiple active ingredient dosage forms, where the formulation can be a single blend or a multi-layer printed tablets having a sustained release properties. This reduces the frequency and number of dosage form units consumed by the patient on a daily routine. 3D printing technology has a great potential in an individualized dosage form concept i.e the polypill concept. [1] This brings about the possibility of all the drugs required for the therapy into a single dosage form unit. Three-dimensional printing is a technology which uses computer aided drafting technology to produce three dimensional objects by layering material onto a substrate.

3DP can be used throughout the drug development process, starting from preclinical development and clinical trials, to the medical care. [2] When compared to the manufacturing process of conventional pharmaceutical product, it has a lot of advantages like high production rates due to its fast operating systems; ability to achieve high drug-loading with much desired precision and accuracy especially for potent drugs that are applied in small doses; reduction of

material wastage which can save in the cost of production and agreeable to broad types of pharmaceutical active ingredients that include poorly water-soluble, peptides and proteins, as well as drug with narrow therapeutic windows.[3]

STEPS INVOLVED IN A 3D PRINTED DOSAGE FORM

Pharmaceutical product is designed in three dimensions with computer aided design. Converting the Design into a machine readable format or a Data which describes the external surface of the 3D dosage form. The computer program then Divides this surface into several different printable layers and transfers those layer and layer to the machine. [4, 5]

Advantages Delivery of 3D Printed Drug

- High drug loading ability when compared to conventional dosage forms.
- Accurate and precise dosing of potent drugs which are administered at small doses.
- Due to lesser material cost of production reduces.
- Suitable drug delivery for difficult to formulate active ingredients like poor water solubility, drugs with narrow therapeutic window.
- Medication can be tailored to a patient in particular based on variation in genetics, differences in ethnic, age, gender and the environment.

3D PRINTING TECHNOLOGIES

3D printing or additive manufacturing is a highly pleasing or attractive technology that produces 3-dimensional objects by constructing layers of the used material under the control of computer software. It has established its ways in engineering and also in non-medical practices, and also in the automobile industries. [6,7]

Types of 3D printing

1. Polypill concept

The concept of "polypill" refers to a single tablet that involves the combination of many drugs. This concept is mainly beneficial for geriatric population, as patients of this age are categorized to multiple disorders and hence multiple therapy is being suggested. [8,9] This technology has been realized through the research in which five different active pharmaceutical ingredients with different release profiles have been formulated or made in a single 3D dosage form. Three drugs namely (pravastatin, atenolol, and ramipril) has to be printed in the extended release compartment. The drugs were physically separated by a permeable membrane of hydrophobic cellulose acetate. An immediate release compartment containing hydrochlorothiazide and aspirin were deposited on top of the extended release compartment.[10,11]

2. Inkjet Printing

In the inkjet printing an approach to a personalized medicine begins from the technique of computer-operated inkjet printing and includes use of inkjet printers. The practicing was done for pharmaceutical use by the replacing the ink with pharmaceutical solutions containing drugs and normal paper with edible sheets known as substrates. Dose changes are done by changing the number of layers printed in a given area or altering the area to be printed. The drug and excipients are designed in a ratio such that it has a potential or a power to print as microdots on an edible substrate. [12, 13]

3. Fused Deposition Modelling (FDM)

Fused deposition modelling (FDM) is commonly used technique in 3D printing and also known as fused filament fabrication (FFF), in this the materials are soften or melted by heat to create objects during printing. FDM 3D printing helps in manufacturing of delayed release printlets without an

outer enteric coating, and also helps to provide personalised dose medicines. [14,15] FDM 3D printing however, indicates several drawbacks of the system such as lack of suitable polymers, slow and often incomplete drug release the reason is the drug remain trapped in the polymers and the miscibility of the drug and additives with the polymers used was not evaluated.[16]

4. Drop-on-powder deposition

Due to the mixture of powder (bed) and binder (ink) they make a solid structure in a layer-wise manner. They allow the elimination of remaining volatile solvents for the stability of the final product Powder particle sticks due to the ink binder and results for the solidification.[17,18] Powder topology and material reactivity by binder are the main two characteristics of powder in the drop on powder deposition.

5. Nozzle-based deposition systems

In Nozzle-based deposition systems mixing of drugs, polymers and other solid elements takes place prior to 3D printing. Direct writing is done, and computer-controlled manufacturing methods are used that place ink direct through a nozzle to create a 3D pattern layer-bilayer with controlled composition and designing.[19,20] Such systems may basically be divided into processes based on material melting and also on processes without material melting.

6. Hot melt extrusion

Hot melt extrusion is the process of melting polymer as well as drug at high temperature and the pressure is applied to the instrument continuously for the purpose of blending. It is a continuous manufacturing process that includes several operations such as feeding, heating, mixing as well as shaping. In recent years, it has been proved that Hot Melt Extrusion have an ability to improve the solubility and bioavailability of poorly soluble drugs.[21,22]

RISK ASSESSMENT DURING 3D PRINTING PROCESS

Risk identification is an important tool to prevent failure of quality control parameters like appearance, content uniformity, assay etc. Identification of risk involves through analysis of the process and process variables to assure that a quality product is being manufactured. Such a critical assessment was done by Norman et al. When a given printer is unable to print a given design, software control should be employed or used.

- Variability or changes in layer thickness has to be controlled by real – time layer thickness monitoring.
- Improper layering due to environmental conditions should be dealt with controlling the temperature and humidity of the manufacturing area.
- Inaccurate position during printing can be stopped by monitoring print head height and print head speed.
- Uneven layers can be avoided by checking powder water content and powder particle size distribution.

3D printing in pharmaceuticals

As per United States Government Accountability Office (GAO),3D printing makes 3D objectives from digital models, and its aim are to produce by layer by layer process.3D printing is gaining and increasing attention in pharmaceutical formulation as they produce different dosage from in various shapes, sizes & release various features.3D printing technology overcomes some challenges in conventional pharmaceutical preparation. Traditional pharmaceutical preparation involves milling, mixing, granulation, compression which may result in drug loading, drug release, drug stability and also in dosage form stability.

Application of 3D printed drug

Commercially available 3D printed drugs

Spritam is marked by Aprecia Pharmaceuticals using the Zip Dose technique based on powder bed fusion. Spritam made by the layer-by-layer production system. The pharmacological efficacy of Spritam was found to be equivalent to conventional tablets. The great improvement is the solubilization time of Spritam was significantly reduced due to its porous and soluble matrix composition.[23]

Personalized topical treatment devices

Nose-shaped masks, loaded with salicylic acid, used for anti-acne treatments, have been developed in a short and efficient manner. The face of the patient was scanned and the taken image was projected to the autocad program, through which the nose section was selected. FDM and SLA, to determine which one was more favourable in terms of engineering, the morphological characteristics of the object, drug release, and the stability during printing. SLA was the most accurate technology for mask manufacture.[24]

3D Printing for cancer treatment

Chemotherapy has widely applied in cancer treatment but chemotherapy can cause side effect. Chemotherapeutic drugs have poor solubility in aqueous media; thus, they are administering through a different route. Currently, the construction of patches loaded with 5-fluorouracil, poly (lactic-co-glycolic) acid, and PCL have been effectively printed and implanted directly into pancreatic cancer.[25,26]

CHALLENGES IN 3D PRINTING TECHNOLOGY

3D printing technology showed promising and efficient results in drug delivery applications, the technology is still under the developing stage. Hence it undergoes and faces many challenges such as optimization process, improving performance of device for versatile use, selections of appropriate excipients, post treatment method, etc., to improve the performance of an 3D printed products and to expand the application range in novel drug delivery systems.[27,28] Apart from the cost of developing new formulations or re-designing existing formulations through 3DP, the built-in flexibility may be a major source of liability from safety point of view.

CONCLUSION

3D printing has become a useful for the pharmaceutical sector, leading to personalized medicine focuses on the patient's needs and effectiveness. 3D Printing technology is emerging as a new horizon for advanced drug delivery with built-in flexibility that is well suited for personalized/customized medication. 3D Printing technology will change or modify the pharmaceutical manufacturing style and formulation techniques.

However, to ensure that 3D printed medicines have the same efficacy, safety, and stability as the pharmaceuticals that are manufactured by the Pharmaceutical Industry there have been a significant barrier. Regarding the establishment of guidelines, laws, quality systems and safety as well as use and consumption of 3D printed medicines, it is a great challenge for the regulatory authorities entailing great obstacles, given the traditional requirements by the pharmaceutical sector.

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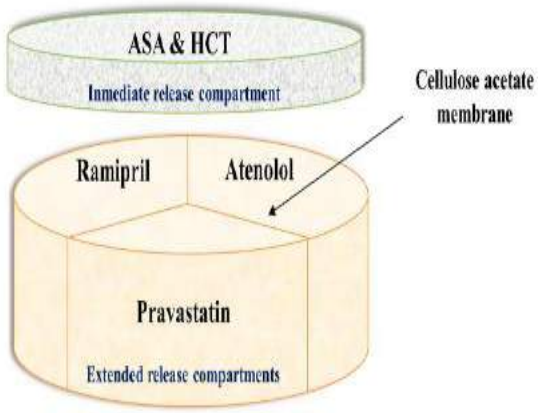

Fig1: 3D Printed polypill

Fig 2: 3D Printing Technologies

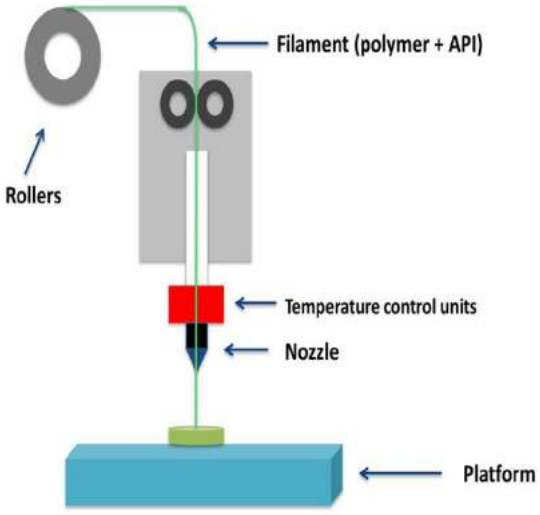

Fig 3: Fused Deposition Modelling (FDM) Printing Systems

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ROLE OF ENGINEERS IN COVID-19

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Abstract

In light of the current novel coronavirus (COVID-19) pandemic, as well as other viral outbreaks in the 21st century, there is a dire need for new diagnostic and therapeutic strategies to combat infectious diseases worldwide. As a convergence science, engineering has traditionally focused on the application of engineering principles to biological systems, collaboration across disciplines, and rapid translation of technologies from the bench top to the bedside. Given these strengths, engineers are particularly well suited to apply their skill set to the current crisis and viral outbreaks in general. This work introduces the basics of virology and epidemiology for engineers, and highlights important developments in the field of engineering relevant to the current pandemic, including in UV light-emitting, disinfection robots 3D-printed 'Made in Catalonia' ventilator, vaccine technology, and small-molecule drug delivery. COVID-19 serves as a call to arms for scientists across all disciplines, and tissue engineers are well trained to be leaders and contributors in this time of need.

Keywords: *COVID-19, pandemic, UV light-emitting, Disinfection robots 3D-printed, ventilator, vaccine technology.*

INTRODUCTION

A Corona Virus is a kind of virus which is mainly originated from Wuhan city of China which also well known as COVID-19. This virus has great impact in entire world due to its high infection rate. Which is mainly spread by COVID-19 infected people? Its origin is still unknown to us. Due to this pandemic situation a kind of war is going on. Where each and every fields of studies having an important to control the spread of this virus. Where medical science has leads most important role because doctors are major warrior for this war. Not only doctors our police service or municipality

they also play important role to control this situation. Where each and every person are fighting this war by following rules of government and some people also helps government by raising found to government. Then what is the role of Engineering? Or How Engineering helps to fight this war? Actually Engineering means dealing with Technology or Innovate new technologies to make humans life easy. The world is changing, and engineers are the ones behind so much of this development. They have great role in each and every field such as medical science, pharmaceutical science, building society, Introducing new machine, Automation of every things and etc.

2. ABOUT THE CORONAVIRUS

Coronaviruses are a large family of viruses that cause illness ranging from the common cold to the more severe diseases such as the Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV) and the current COVID-19. These viruses consist of a core of genetic material surrounded by an envelope with protein spikes, which gives it an appearance of a crown. Coronaviruses are zoonotic, meaning they are “transmitted from animals to humans.” In the current outbreak, it was found by the scientists that this Corona virus was a new strain. Thus, it was named ‘novel’ or new Corona with the appellation of ‘n-Corona’. It was later renamed as SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) by the International Committee on Taxonomy of Viruses, owing its similarities in genome structure with that of SARS virus. The SARS-CoV-2 is believed to have taken the following sequence- It originated from bats, and then transmitted to pangolins to humans. The sequence is yet to be confirmed. Until the source of this virus is identified and controlled, there is a risk of reintroduction of the virus in the human population and the risk of new outbreaks like the ones we are currently experiencing. It was the wet markets (selling live meat, fish, reptiles and wild animals) in Wuhan, where the virus It was believed to have spawned, precisely the Wuhan Seafood Wholesale Market. The problem with these Chinese wet markets was that all sorts of animals, ranging from fowl to wild animals, were sold there for their meat (for example monkeys, python, dogs, hares and pangolin etc.) without due care of hygiene. Previously, On rare occasions, a coronavirus may spread through contact with faces. In these wetmarkets,

2.1. How It Spread: It is believed that the virus was transmitted to humans through the fluid secreted from the respiratory system of the wild animals. Further, it spread from humans to humans while coughing and sneezing, shaking of hands, making contact with a surface or object that has the virus etc.This virus as various modes of transmission which are given below.

2.2. Respiratory transmission: While the basic outlines of disease transmission have not been upended by COVID-19, there are some nuances that could play an important role in the spread of the disease.t is mainly transmitted between people through "respiratory droplets" when symptomatic people sneeze or cough. This idea, that large droplets of virus-laden mucus are the primary mode of transmission, guides the CDC's advice to maintain at least a 6-foot distance between you and other people. The thinking is that gravity causes those large droplets (which are bigger than about .0002 inches, or 5 microns, in size) to fall to the ground within a distance of 6 feet from the infected person.

2.3. Aerosol transmission: In order for the virus to be spread without being coughed or sneezed in large drops of mucus, it has to somehow be able to suspend in the air for long enough to

infect passer-by.And that's another complicating factor in figuring out transmission: People emit virus particles in a range of sizes, and some are small enough to be considered aerosols, or fine particles that can stay suspended in the air for hours and can travel with air currents across tens of feet.

2.4. Contact transmission: There's one other route that's thought to play a role in the spread of COVID-19: contact transmission. In that situation, viral particles emitted from the respiratory tract of an infected individual land on a surface. Then, another person touches that object, then touches their nose, mouth or eyes. The virus then sneaks into the body via the mucous membranes, infecting the second person.

2.5. Preventions Equipment's: There are various equipment's which are helps to prevent the spread of this virus. The equipment's are

- Sphygmomanometer and infrared thermometer - sphygmomanometers should have calibration date stickers.
- Pulse oximeter.
- Glucometer including appropriate strips and lancets.
- Alcohol wipes, gloves, lubricating jelly.
- Alcohol gel for hands.
- PPE KIT

With numbers of patients skyrocketing, stopping the spread of Covid-19 is an immediate concern. Multiple readers urged engineering companies to design, develop and manufacture more diagnostic kits, as well as improving logistics to distribute them quicker.

3. ROLE OF ENGINEERS

The answers are hugely encouraging, with many good ideas and willing helpers. They will hopefully provide inspiration for potential volunteers and maybe even guidance for under-pressure officials, who could use this engineering expertise to help minimise the worst of the virus' impact. Engineering solutions would have been especially effective early on during the outbreak, before measures like lockdown were introduced. But even during lockdown, they could help minimise the spread of the virus in the parts of society that are still open, such as banks and supermarkets. When you look at the potential that engineering can bring to this in a public health (preventive) rather than a medical (restorative) setting, it shows how much we're actually missing. It may be that these particular (disinfectant) solutions are not workable at scale, but the point is that engineers could probably come up with other design solutions that would work. It's their job. Everyone should follow social distancing and other temporary rules. But with potentially months of restrictions ahead and the possibility of the outbreak stretching on, here are six ways that engineers could help. Following criticism of the government's comparatively low level of testing, one member suggested engineers could install "intelligent body temperature detectors at schools, supermarkets, etc". Other cutting-edge engineering could help lower infection rates. "Cleaning solutions and material development with inbuilt anti-bacterial properties being developed into our design solutions would be positive," said Daniel Marsh.

3.1. Support the NHS: More hospital spaces are needed for patients as the NHS comes under increasing strain. The ExCel Centre in East London is being co-opted as a field hospital and could reportedly hold up to 4,000 patients. Following similar measures in China, readers suggested engineers could help build new hospitals, including by designing and manufacturing buildings using offsite construction. Improving Personal Protective Equipment (PPE) for NHS staff was a common suggestion. "NHS masks are 'one size fits all'," said William Richardson. "To state the obvious, everyone's face is slightly different." Member Caroline Rose suggested improvements could include

atmosphere control and filtering, and decontamination. UV decontamination units could reduce waste – and therefore demand – on essential equipment, said one reader. With multiple efforts ongoing to develop a vaccine, Paul Rosenberger said companies should prepare for increased demand for injection needles.

3.2. Spread Stem knowledge: While pupils might have hoped for a break during school closures, teaching is ongoing. This could be a great opportunity to educate and inspire a future generation of engineers, said Dave Hughes.

3.3. Prevent future outbreaks: Engineers should carry out a full assessment of medical equipment that might be required in similar situations, said Rich Pearson, to ensure that designs can be open-sourced and shared with manufacturers when needed. Industry itself should have a frank appraisal of its international activity to help prevent a repeat of this pandemic, said Paul Thurgood. Companies and employees might need to act differently in future**.**

3.4. Run the country: Others suggested practical ways of helping the government, including giving guidance on statistical modelling and risk assessment, managing supply chains and assisting planning.

3.5. Latest Development Invention to Control COVID-19: In response to cases of COVID-19 rising worldwide, the World Health Organization has recently warned that the pandemic is "accelerating." Thankfully, it does say the trajectory can still be changed. That's why the global scientific community is pulling together in order to develop viable treatments and vaccines to combat the spread of the infectious disease. Much in the same vein, the world is in desperate need of ingenious solutions to widespread issues such as supply shortages of medical equipment.

3.6. Reverse-engineered 3D-printed ventilators: After the outbreak soared to uncontrollable levels in Italy this month, Dr Daniele Macchini famously wrote that a scarcity in the medical equipment required treating patients means that "every ventilator becomes like gold." Despite the possibility of being sued by the medical technology company that manufactures a specific ventilator, the volunteers reverse-engineered the piece that was required and were able to print it in a matter of hours to help save lives.

3.7. The snorkeling mask ventilator: Only a few days after helping an Italian hospital by playing their part in fixing the broken supply chain for ventilators, the same group of engineers shared a 3D printed design for an adapter that converts snorkel masks into ventilators. Through the use of the adapter, a converted "Easybreath" snorkel mask becomes a functional C-PAP mask for oxygen therapy — a treatment that is critical for the recovery of people with severe cases of COVID-19. Robots helping populations affected by the pandemic worldwide Countries throughout the world are deploying robots to help amidst the growing crisis. In Bangkok, Chulalongkorn University has teamed up with Advanced Info Service (AIS) to develop robots that utilize 5G technology to monitor coronavirus patients while keeping doctors in the loop from afar. As Business Insider points out, the city of Wuhan, where the outbreak started, is using robots to spray disinfectant throughout urban spaces.

3.8. Coronavirus isolation pods made by Mexican engineer: Special fully-sealed isolation pods were recently created by Mexican engineer Fernando Aviles for safely transporting COVID-19 patients. The specially-designed pods are equipped with air pumps that create a negative pressure within the sealed space.The negative pressure means that, even if the plastic lining of the pod is torn during the transfer of a patient, any fluids will remain inside the isolation pod — an ingenious method for stopping the spread

of the infectious disease amongst healthcare workers.

3.9. UV light-emitting disinfection robots: UV light disinfectant robots weren't specifically developed for the COVID-19 pandemic and they haven't been definitively proven to be effective at eradicating the virus (SARS COV-2) from surfaces — and yet, demand has skyrocketed to the point that companies are sending truckloads of the machines to different countries worldwide. Hospitals worldwide seem to be trusting that this is true, as demand is sky-high for the robots which use eight light bulbs to emit concentrated UV-C ultraviolet light over hospital surfaces. This type of light has been shown to destroy viruses, bacteria, and other harmful microbes by damaging their DNA and RNA so that they can no longer multiply.

3.10. Oxford University and King's College prototype ventilator for mass production: Engineers, anaesthetists, and surgeons from the University of Oxford and King's College London are working on one of the many new ventilator designs needed to help patients with severe conditions. Though it is less advanced than other existing ventilator designs, it has been designed for its quick construction and deployment time.

3.11. 3D-printed 'Made in Catalonia' ventilator: After Italy, Spain currently has the second-highest death toll in the world for the coronavirus — at over 3,400 deaths, Spain has recently surpassed the number of deaths in China. As with any country currently suffering a wave of COVID-19 cases, ventilators are in very high demand.

3.12. Artificial intelligence used to analyze self-isolation habits: Some countries have taken longer than others to announce police-enforced lockdowns. In the United Kingdom, for example, the decision was only enforced yesterday. According to research by Vivacity Labs, a start-up that makes camera-based traffic sensors, the enforcement was severely needed.

3.13. U.S. army corps engineers convert buildings to provide 10,000 new beds: Confirmed cases of the coronavirus have surged in New York in the last week. With over 25,000 cases and 210 deaths at the time of writing, it has become the epicenter of coronavirus cases in the U.S.That's why the United States Army Corps of Engineers has stepped in to convert buildings into hospitals in order to create new ICU space for the growing number of patients. The plan is expected to provide 10,000 hospital beds in the state of New York.

3.14. Spain to use AI and robots to quadruple testing capacity: As well as a great necessity for ventilators, and hospital beds, there is also a need to test huge numbers of people while keeping up with the growing number of infections. In Spain, they have turned to AI and robotics to enhance the country's testing capability.According to Bloomberg, Spain has been testing between 15,000 and 20,000 people a day. Now, the country will use robots and AI to quadruple that capacity.

CONCLUSION

The world faces a global health-care crisis of unheralded magnitude. The rate of infection and mortality from COVID-19 make it unlike any virus seen in this century. Engineers and Scientists are banding together to combat the threat of SAR-CoV-2. Engineers have a rare set of tools and can make substantial contributions to our understanding of viral disease and contribute toward the critical development of diagnostic and therapeutic platforms. Together, we can overcome this current pandemic and work to prevent and mitigate future viral outbreaks.

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A STUDY ON PROPAGATION AND RELEVANCE OF INCLUSIVE EDUCATION: IN THE CONTEXT OF INDIAN CONSTITUTION AND SOCIETY

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Abstract

In this paper researcher tries to propagate the concept and need of inclusive education among the learners and people. India is the largest democratic nation in the world and third largest education system prevails in India. In India, each people are equal in accordance to Constitution. Inclusive education is a philosophy which includes all kinds of pupils irrespective of gender, colour, religion, cast, language, location, social and economic status, physical disabilities. Through this philosophy equilibrium can prevail in the society which is the ultimate the goal of our constitution and preamble also discuss about it. The study is descriptive and conceptual in nature. Different secondary sources like- books, journals, periodicals, articles used for the data sources. After the analysis of data, it is found that, the propagation of inclusion in education is utmost important, in the different parts and articles of Indian constitution discussed about the inclusion in direct or indirect ways. Different phenomenon of society also promotes the inclusion. The study also showed the problems of implementation of inclusive education in Indian class rooms.

Keywords: *Inclusive education, Constitution, Society, Democracy etc.*

INTRODUCTION

Inclusive education is a new approach or philosophy towards educating the children with disability and learning difficulties with that of normal ones within the same roof. It brings all the students together in one class room and community, irrespective of their strengths or weakness in any area and seeks to maximise the potential of all students. So, heterogeneity prevails in an inclusive class room. India is a democratic, secular, republic nation. Existing the heterogeneity is common issues in Indian society. The practice of inclusion is not much older in the Indian education system. It can be said that, stereotype social customs and economic hinderance were the main obstructions in the propagation and expansion of inclusion in Indian education system. In 1974, the centrally sponsored scheme for Integrated Education for Disabled Child (IEDC) introduced to give equal opportunities to children with disabilities in general schools and facilitate their retention. National Policy of Education (1986) mentioned that- "to *integrate the*

handicapped with the general community at all levels as equal partners, to prepare then for normal growth and to enable them to face life with courage and confidence." The world declaration on education for all adopted in 1990 gave further boost to the various processes already set in country. The Rehabilitation Council of India Act 1992 initiated a training programme for the development of professionals to respond to the needs of students with disabilities. With the release of Salamanca statement in 1994 (UNESCO), many developing counties starting their policies to promote the inclusion of students with disabilities into mainstream schools. At Jometin World Conference (1990) in Thailand also emphasis on Education for All - which emphasis on inclusion. Different International and National Activities engage to full fledge implementation of inclusion in education.

1.1 Significance of the study-

Now, we are living in the era of technological advancement and development. Government taking different people friendly initiatives for their development of societal as well as economic status. Indian constitution also works as a safeguard for the rights of peoples. SarvaShiksha Abhiyan (SSA) was launching to achieve universalization of elementary education (UEE) in the year 2001. Zero rejection policy has been adopted under SSA, which ensure and secure the education of Child with Special Needs (CWSN).School is the miniature of society. So, societal relations, interaction, phenomenon taking place in the class room in various form and different ways within the diverse category of learners. Liberal and democratic Class room climate as well as school climate is necessary for the holistic development of the pupil's personalities. So, any type of discrimination and biasness should not entertain in the schools which can hinderance to achieve the egalitarian nature of society. Indian society is pluralistic in nature, so to maintain the unity in the society we should give equal importance on every pupil to get quality education irrespective of any difficulties. Now, the study is very important in accordance with the societal change and societal demand.

1.2 Methodology of the study

The study is descriptive and conceptual in nature. Qualitative research method has been followed throughout the study. Different secondary data sources like- books, articles, periodicals, journals etc. used for the study.

1.3 Objective of the study

The study attempts-

1. To find out the relevance of Inclusive Education in the societal context of India.
2. To find out the relevance of Inclusive Education in the context of Indian Constitution.
3. To find out the challenges to implement the philosophy of inclusion in class room.

1.4 Research Question:

Research questions of the study are-

1. How the inclusive education is relevance in the context of Indian society?
2. How the inclusive education is relevance in the context of Indian Constitution?
3. What are the challenges to implement the philosophy of inclusion in class room?

1.5 Delimitations of the study:

The study has delimited in following ways

1. The entire study has done in the context of India.
2. The study mainly focus on the societal context and different education related clauses and articles of Indian constitution.
3. The study mainly done in the context of school education of India.

1.0 Meaning of inclusive education:

Now, providing quality education to all children of 6-14 years is mandatory for respective governments as it is fundamental rights of the pupils **(Fundamental rights, Indian Constitution,2002)** Inclusive education is an initiative that includes the diverse types students in a single class room. Inclusive education emphasis in the inclusion of differently able students in a same class room with the general students. But now inclusive education means not only the include differently able students in the general class room but also include students from socially disadvantage groups, economically weaker sections, religion and linguistically backward students in a same class room. Inclusive education means that all students attend and are well come by their neighbourhood schools in age appropriate, regular class and are supported to leans, contribute and participate in all aspect of the life of the school. The principle of inclusion education was adopted in Salamanca. The statement entitles as- "World Conference on Special Needs Education: Access and Quality" and it restated at World Education Forum (Dakar).In India, National Council of Educational Research and Training (NCERT) joints hands with UNICEF and launched – "Project Integrated Education for Disabled Child (PIED)" in the year 1987, to strengthen of learners with disabilities into regular schools. National Curriculum Framework-2005 stated that- "It is important to create in inclusive environment in the class room for all students specially those who at risk of marginalisation, for instance, students with disabilities. Labelling and individual student or a group of students as learning disabled etc. creates a sense of helpless, inferiority, and stigmatization. It tends to overshadow difficulties that children may be facing in schools due to diverse socio-economic background and inappropriate pedagogical approaches being used in the class room. A student with a disability has an equal right to membership of same group as all other students. Differences between students must be viewed as resources for supporting learning rather than as a problem. Inclusion in education is one of the components of inclusion in society."

3.0 Analysis and Discussion of the Study

3.1 Inclusive Education and Indian Society

The nature of Indian society reflects in the constitution. In the preamble of Indian Constitution states that- India as a Sovereign Socialist Secular Democratic Republic Nation (Preamble of Indian Constitution, 1976).Constitution gives the equal rights and power to every one of the countries. In the context of Indian society, heterogeneity found in many aspects like-gender, religion, economic, languages, status, culture, disability but can't discriminate the people based on this heterogeneity. Children with disabilities are not excluded from free and compulsory primary education, or from secondary education, on the basis of disability and can access an inclusive, equality and free education on an equal basis with others in the communities in which they live (UN convention on Persons with Disabilities 2006: Article 24).

Basic socialization starts from class room. Socialization is a complex phenomena and process. To properly socialise students, implementation and practice of inclusion is the best way. Different societal components and inclusion process discussed in flowing ways-

3.1.1 Social interaction and Inclusive education: Societal interaction taking place through exchange, competition, conflict,

cooperation, accommodation. All these components of social interaction act vibrantly when heterogeneity prevails in the society. So, if we introduce the inclusion philosophy in the class room then heterogeneity prevails in the class room that would help to exchange the valuable ideas, healthy competition, constructive conflict, cooperative attitude, accommodation according to situation. So, to establish the humanitarian bonding among the peoples of society through societal interaction, initiation should start from class rooms through implementation of inclusion in class room.

3.1.2 Social equilibrium and Inclusive education:

Change and equilibrium is the law of nature. There is always a conflict taking place between change and equilibrium. As the nature of society is heterogeneous maintain the equilibrium in society is quite difficult. To establish the equilibrium in society, equal place and importance should give to each component of society and peoples. So, biasness should not entertain in the class room based on any types of disability or economical weakness. Status of Equality should practice in class room which would work as a milestone to genesis the equilibrium in the society.

3.1.3Unity in diversityand Inclusive education:

One of the major characteristics of Indian society is unity in diversity. Diversity prevails in Indian society in different issues. Through the education socialization of social beings means pupil taking place. So, education takes major role to being or to propagate unity among the pupils. That's why unity should present in education system. Holistic participation in education should free and open, so that all students can take part in education system. So, the concept inclusion shouldembedded in our education system is very important system to establish the concept of unity in diversity in Indian society.

3.1.4 Egalitarian society and Inclusive Education

In a democratic nation egalitarian approach is very important in society. In an egalitarian society importance given on individuals. In an inclusive classroom we nourish and involve diverse types of learners in a class room. So, inclusive class room works as mile stone for establishing the egalitarian society.

3.2.Constitution and inclusive education

Indian constitution is the written document which helps to maintain the administration of the country. Preamble of the constitution is one type of abstract which reflects the purposes and functions of the constitution. Different articles and clauses show different rights and duties of the peoples.

3.2.1 Preamble of the Constitution

In the preamble of Indian constitution different important terms have been used which are self-significative

- **Justice:** In a democratic nation, justice indicates the justice of common people for their social, economic and political rights. So, on the point of justice, we can't discriminate the pupils based on any type of disabilities in the common schools. Based on justice, each pupil (irrespective of disabilities, social status, economy, gender) has a right to get an equal education provide by government.
- **Liberty:** Indian peoples get the opportunities of liberties of thoughts, belief, faith and worship. If we discriminate the pupils based on disabilities then they would unable to express their belief, thoughts, faith. So, class room climate should democratic and the role of teacher should liberal which helps to expand the concept inclusion.

- **Equality:** Equality is one of the basic tenets of democracy. All are equal irrespective of their cast, creeds, gender, religions, economic status, disabilities. So, we can't do any type of discrimination of disable pupils to take education with normal pupils.
- **Fraternity:** It encompasses the dignity of individual and the unity and integrity of nation. So, individual is very important in the context of democracy. To enhance and enrich the fraternity, inclusion is very important. Heterogeneity nature of class room helps to propagate fraternity among the pupils as well as peoples.

3.2.2 Constitutional Provisions on Education and inclusive education:

The well-known ***Kothari Commission (1964-66)*** recommended that-Central Government should undertake the responsibility in education for the equalization of educational opportunities with special reference to the reduction of inter-state differences and the advancement of the weaker section of the community.

In the constitution of India different clause and articles discussed about the education of pupils. Constitution in its different articles discussed about the Education as-

- **Free and Compulsory Education:** The Constitution makes the following provisions under *Article 45* of the Directive Principles of State Policy that, *"The state shall endeavour to provide within a period of ten years from the commencement of this Constitution, for free and compulsory Education for all children until they complete the age of fourteen years."* It is clearly directed in Article 45 of the Constitution that the provision of Universal, Free and Compulsory Education becomes the joint responsibility of the Centre and the States. The term "*all children*" includes all the children irrespective of their cast, economy, social status, disabilities means constitution fully engaged to implement inclusion in education.
- **Education for Weaker Sections:** Article 15, 17, 46 safeguard the educational interests of the weaker sections of the Indian Community, that is, socially and educationally backward classes of citizens and scheduled castes and scheduled tribes. Article 15 states, "Nothing in this article or in clause (2) of Article 29 shall prevent the state from making any special provision for the advancement of any socially and educationally backward classes of citizens or for the scheduled castes and the scheduled tribes."
- **RTE Act. 2009:** The right of children to free and compulsory education act 2009 promote the free and compulsory education to all the children of age six to fourteen years.Act also ensures that, the child suffering from any disability have right to pursue free and compulsory elementary education.
- **Fundamental duties-** "*Articles 51A (k)*: It shall be the duty of every citizen of India who is parent f guardian to provide opportunities for education to his child or ward between the age of 6 to 14 years."
- **Fundamental Rights:**The 86th amendment to constitution of India in 2002, provide right to education as a fundamental right in part-III of constitution. A new *Article 21A*has inserted which made right to education a fundamental right for children between 6-14 years which would help to propagate the inclusive education.

4.0 Challenges of inclusion in Class room: India is the second largest populous nation in the world. Implementation of any policy or programme is not easy in India. Huge

percentage of disabled people live in India and their problems are so complex. Flowing are the major challenges in introducing the inclusive education in Indian class room-

1. The main problems of the implementation of inclusion in class room is the absent of proper Infrastructure. Deficiency of Appropriate sits, ramping, wheel chair are the major problems in implementation the inclusion.
2. Adequate and efficient teacher's scarcity is the major problems. Numbers of special teacher training institutionsare quite low.
3.In an inclusive class room there need the diversity and innovative teaching learning materials. But in our school systems, traditional TLMs like maps, charts, globe used which are unable to fulfil the needs of special Childs.
4. In our schooling systems, rooms are large and huge number of students participate in teaching learning. To run the inclusion the numbers of students should reduce to emphasis on individual students.
5. Student teacher ratio is very high. students cannot interact with teacher about their problems.
6. Stereotype social customs is one of the main prob in inclusion. Guardian of general students don't want to inclusion in general schools. Guardians of special child also try to avoid the general schools, they think their children would isolated in general class rooms.
7. As the number of special trained teachers is very low, traditional teaching methods followed in inclusive class room. Curriculum also rigid for special child. That's why, inclusion in general school is quite critical.

5.0 Conclusion

At present education system, inclusion in education a vibrant issue. As India is the largest democratic nation and second largest populous country, it is quite critical to implement the inclusion in education. Government taking different initiatives for the implementation of inclusion in education. Special trained teachers gradually increase, and guardians are also aware about it. Infrastructural development, technological innovation, flexible curriculum, innovative methods of teaching are necessary to implement inclusion in education. So, it can be concluded that, within a few years it can be possible to transform class rooms into inclusive class rooms.

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LETTERS OF SHEIKH SHARAFUDDINYAHYAMANERI: A STUDY OF SOME SPIRITUAL ASPECTS IN RELEVANCE TO THE MODERN-PERIOD

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Abstract

Tasawwuf refers to the inner cleansing of the body to shape the outer deeds or practical dimension of human being. Spirituality plays a significant role in constructing a positive nature towards the establishment of both worldly and religious ties. Various spiritual writings came into existence throughout the centuries to provide useful lessons on the basis of the primary sources of Islam (Qur'ān and Sunnah) regarding the connection between man and God. One of such contributors in this category was Sheikh Sharafuddin Ahmad YahyaManeri, also famously known as Makhdum al-Mulk or Makhdum-i-Jahan (1263-1381 A.D.), a prominent Indian Sufi Saint of the medieval period, whose letters (*Maktubāt-i-Sadi*and*Maktubāt Do Sadi*) are still held in high regards even today as they are his best collection on spiritual teachings and guidance. They truly reflect his profound knowledge and spiritual enlightenment comprising of outstanding critical expression, exposition of delicate issues and correct comprehension of the true spirit of the religion, thus holding a place of distinction in the Islamic Literature. This paper will highlight some of his spiritual doctrines including righteousness, mental stability, and the eradication of human greed and expiation of sins. It will also depict how the relevant practical aspects of spirituality can prove to be a helping hand in moulding the behaviour and conduct of individuals in a war-ridden world.

Keywords: *Tasawwuf, Practical Dimension, Righteousness, Mental Stability, Expiation of Sins.*

INTRODUCTION

India is one among such countries which has produced a number of spiritual Saints and intellectuals and whose names are carved in the annals of the great spiritual contributions in the history of Islam. Their spiritual teachings are not only famous for namesake, but also their practical dimensions are of massive importance even today as we are living in a world of spiritual turmoil. These steps towards human revivification are mandatory to be taken in order to find the way of exit from the slumber of darkness and move towards the lane of enlightenment. Sheikh Sharafuddin Ahmad YahyaManeri (1263-1381 A.D) can be described as one of the finest

spiritual luminaries whose certain spiritual notions can still be proved to provide a helping hand in curing the detrimental psychological disability, thus engaging man in the true moulding of behavioural reconstruction to shape both his inward and outward executions, especially in this very world of moral declination.

Maulana Syed AbulHasan Ali Nadwi has dedicated the last chapter of his masterpiece *Saviours of Islamic Spirit vol.II (TareekhDawat-o-Azeemat vol.II)* to Sheikh Sharafuddin Ahmad YahyaManeri. Syed AbulHasan Ali Nadwi discussed: The forceful style of Sheikh Sharafuddin Ahmad YahyaManeri's writings, combination of loveliness and sophistication gives a noticeable rank to his letters in the field of the Islamic literature. In these letters, he has illustrated the fruits or influences of higher significance symbolizing the inward intellect of invisible divine content of things.Sheikh Sharafuddin Ahmad YahyaManeri used by the means a solid and effective inspiration and motivated the peoples with a yearning to achieve the position or place of glorious spiritual truthfulness. Due to his writings which are helpful, politeness of expression may be whole in Persian literature something like this.

Besides, to those privileged peoples to whom these spiritual letters were dedicated, also many others have read them with interest, even after the centuries of Sheikh Sharafuddin Ahmad YahyaManeri's era. In the Khanqahs, these spiritual letters have been thoughtfully examined and discussed and they still grasp the consideration of those who think over them in search of the new dimensions of instinctive insight and lightening of heart. It would be difficult to overstate the strength and dynamism of these letters which, nevertheless the interval of many centuries which were written by Sheikh Sharafuddin Ahmad YahyaManeri, still preserve their freshness and emotional call.

The letters of Makhdum Sharafuddin Yahya Maneri reflecthis deep knowledge and spiritual enlightenment. In thedepth of his vision, wonderful critical arguments, elucidation ondelicate issues, sharp observation, suitable understanding of the spirit of religion, elaboration on the revealed realityand light of divine knowledge,comprising of the total concentration of Allah. The letters of Sheikh Sharafuddin Ahmad YahyaManeri holds a special as well as a unique position in the Islamic literature. These letters depict the inspirational and spiritual magnificence thus planting the living seed of faith in Allah, instinctively grasped thoughts, the procedures of self-cleansing, and the methods of motivating and ameliorating the spiritual life

Letters

The most renowned among the collection of Sheikh YahyaManeri's letters is the one published under the title of *MaktubatSheikh Sharafuddin AhmadYahyaManeri*, which is also known as *Maklubat-E-Sadi* or *SehSadiMaklubat*. This collection comprisesof one hundred letters addressed to QaziShamsuddin compiled by the chief disciple of MakhdumYahyaManeri, Sheikh ZainBadrArabi. In its introduction Sheikh ZainBadrArabi writes: SheikhShamsuddin of Chausa (a place where Sheikh ShamsuddinAhmad Maneri lived), a disciple of the Sheikh, continuously appealed to Sheikh Sharafuddin Ahmad YahyaManeri in his letters that since he had to stay at a place far away from him and was forbidden from attending his discourses, something to guide him on his spiritual journeymight be committed into written form.

Sheikh Shamsuddin pleaded Makhdum Yahya Maneri so sincerely that his appeal eventually met the approval of

the Sheikh who started writing about the various stages and states underwent by the seekers of truth in their quest of perfection of divine knowledge. Only then that numerous thoughtful yet enigmatic details relating to spiritual repentance and enlightenment, Unity of Allah and knowledge of Divine Attributes, Essential and enthusiasm of love, stages of attraction and endeavor, separation and loneliness, bliss and blemish, preceptor-ship and discipleship along with the accounts of earlier followers of the path of purity were penned. These letters were sent on different occasions during the year 747 A.H. (1369 A.D.) from Bihar to the town of Chausa. Numerous followers and inmates of the convent kept copies of these letters and compiled them for the spiritual purification searchers.

Subject Matters

Anybody who goes through these letters would not fail to identify that the marvelous details and essence of truths not visible to the external eye, illustrated by MakhdumSharafuddin Ahmad YahyaManeri, are neither the effortts of his sharp intelligence nor could these be had by profound learning or cultivation of knowledge, but could only be lived by a heart in its loftiest stage of spiritual acclamation.What Makhdum says about the sublime majesty and excellence of Divine Being, His Might and Omnipotence? His Beauty and Perfection, the feelings of awe, hope and ardent love taking root in the heart of true believers and Gnostics, the need for alternate states of effulgence and contrition experienced by the travellers of the spiritual path and repentance on one's sin which opens the floodgates of Divine compassion point out that the writer, soaring in higher domains of spirituality, is familiar with the inner content of profound realities.

The high position occupied by man among the beings, his greedy desires, his wish to acquire the impossible, his certitude and firmness of mind, the status and beauty of his heart and the unsounded essence and nature of love described in a wonderful and dynamic language by MakhdumYahyaManeri deserves to be praised by all. Likewise, the immoral kinds of natural tendencies of the human mind, his own self-deceptions and the whispers of Satan, transgressions that often take the form of vices hindering the path of the devotees explained by Makhdum speak of his deep observation and knowledge of practical morals.

Sheikh Sharafuddin Ahmad YahyaManeri appreciated and at the same time warned spiritual seekers from the dangers coming from the ways of the Sufi Saints. Appreciation of that is they believe in the Shari'ah and the treatment of the highest position of the Prophet Muhammad (ﷺ). It is also important to know and understand the religious thought and different ways of Sufi Saints of the time when these letters were written down by Sheikh SharafuddinYahyaManeri. Here, it is an attempt to evaluate some letters of MakhdumSharafuddinYahyaManeri which deal with some of the issues which have to quite a large extent, similarity with the modern problems.

Sheikh Sharafuddin Ahmad YahyaManeri has addressed most of his letters to one of his closest disciples Sheikh Shamsuddin for the spiritual guidancewhose content can still be considered to be of great significance and relevance in solving a number of spiritual malaise. The spiritual teachings in his letters indicate its formulation to be on the basis of the primary sources of Islam (Qur'ān and Sunnah).This shows us that any individual who wishes to tread or embark on the spiritual path can opt to study the letters of Sheikh Sharafuddin Yahya Maneri as they do not consist of any such element which will make a man fall into the trap of contrariness. The following are some of his spiritual aspects discussed in his letters which can

still be held in high esteem and offer fruitful spiritual and practical remedies of various modern-day detrimental issues.

1. Righteousness in Faith

According to Sheikh Sharafuddin Ahmad YahyaManeri, righteousness in faith refers to longing for nothing except Allah. If we intent or reflect about anything not in consonant with Qur'ānic injunctions this becomes a proof of weaker faith. Inner purification leads to the erasure of filthy desires thus projecting an impactful effervescence on the outer personality. This includes behavioural rectification, correction of deeds and improvement of manners. Faith no doubt plays an important role in the redressing of the inner dimension of man which helps to control the outer practices in the most convenient way. Sheikh Sharafuddin Ahmad YahyaManeri further discussed about the genuineness of faith, he divided peoples into two categories or groups. The first group is those who do anything in the name of Allah but for the sake of their own interest. The second one is those who perform good deeds without even thinking of the reward that Allah has promised them. Their main interest is to achieve the love of Allah through the fulfilment of the command of Allah. These peoples are also known as Muttaqi (*God-fearing*).

2. Mental Attitude

Psychological stability is the foundation for developing a good thinking process. A good mental attitude is of optimum importance so as to shape the behaviour of man. One of the qualities pointed out by SharafuddinYahyaManeri for a positive conduct is generosity. Through generosity, we can improve our mental attitude and develop an affirmative approach toward the people as well as Allah.This helps to design a harmonious atmosphere and strengthens our social as well as personal relationships. Where generosity prevails trust is also maintained. On this basis people develop good opinions towards each other thus upholding positivity and eschew wickedness, Allah says in the Qur'ān. Regarding good opinion, Sheikh SharafuddinYahyaManeri says that it is a must for every individual and more than that respect and commitment to Allah is incumbent as He is our Lord, and that the Creator is always above the creatures. In a nutshell, the following points can be derived-

i. Those who opine positively about Allah will have their inner-self enlightened by Him.
ii. Good opinion leads to incipient love.
iii. Love creates social unity.

3. The eradication of human greed

The very next letter of Sheikh Sharafuddin Ahmad YahyaManeri's spiritual writings in which he discussed about the eradication of human greed, which is an important and compulsory subject. Without the eradication of the human greed, our intentions and everything that we do will be null and void. So, Sheikh Sharafuddin Ahmad YahyaManeri shared his ideas with his closest disciple QaziSheikh Shamsuddin and strictly warned him to remove greed from your route because Allah does not like greedy people. Greed very often leads to arrogance, *"Assuredly, Allah knows what they conceal and what they declare. Indeed, He does not like the arrogant",*(Qur'ān S16: V23). Sheikh Sharafuddin Ahmad YahyaManeri further expresses his opinion that Allah gives us anything anytime without any reason and no limit And another thing is that today whatever we take from Allah is free and after this world whatever we will receive also will be free from Allah. So it clear that our intentions should be free from greed and show-off, it must be only for the sake of Allah.

4. Expiation of Sins

In this letter, Sheikh Sharafuddin Ahmad YahyaManeri stated that the compensation from the wickedness is

compulsory for the formulation of a good mental attitude and behaviour towards the society as well as the Allah. This shows us Sheikh YahyaManeri divided peoples into three categories are as follows-

i. They are in both presence and truth, which relates only to the world, which means there is no intention and purpose for the sake of Allah. They do everything for the sake of the world only.
ii. This type of people also in both look and reality is directed toward the Allah, but in the inner side and the purpose is for the sake of the world.
iii. In this category, Sheikh SharafuddinAhmad YahyaManeri talking about those people whose appearances are concerned is directly toward the world, but in purpose and intention for the sake of Allah only.

Conclusion

Tasawwuf is one of the most important components in Islam, which helps to clarify both the inward and outward aspects of man. Sheikh Sharafuddin Ahmad Yahya Maneri has highlighted some very important points which play a very significant role in the development of a good personality. The above-discussed ideas help one to realize that vices only cause harm to one's life and that man becomes victims of various other social issues. Therefore, to be on the safer side, one needs to develop a practical dimension of the points discussed by Sheikh Sharafuddin Maneri, which can prove to be fruitful as well as productive a better lifestyle and most importantly the objective must be free from ostentatious factors. It must be executed to seek the pleasure and satisfaction of Allah. With a world full of innumerable and catastrophic vices, a return to the true spirit of Islam is the only solution for the betterment of the whole community.

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THE NEED OF READING

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Abstract

As we know that Reading is important in acquiring vocabulary of a language. It contributes to the development of all measures of language competence which include vocabulary, spelling, syntax, grammar etc. The review supports that readers acquire language subconsciously when they receive comprehensible input in a low anxiety situation. Pleasure component in reading will lower the anxiety level of learners in all the learning. Despite the benefits of reading, curriculum designers include more reading activities in the curriculum. In fact, reading is a powerful tool for acquiring vocabulary and forms and, therefore, more reading could be included in all curriculums. This paper claims that vocabulary acquisition is a key component of language acquisition.

Keywords: *Acquiring Vocabulary, language competence, Pleasure component, Curriculum.*

INTRODUCTION

Vocabulary is a powerful ingredient for reading comprehension **(e.g., Ahmed et al., 2016; Cromley & Azevedo, 2007).** Ahmed and colleagues (2016) examined several predictors of reading comprehension among middle and high school students and reported that vocabulary knowledge predicts reading comprehension at all grade levels. In addition, vocabulary knowledge and background knowledge were highly correlated, which suggests that students with stronger vocabularies also had greater background knowledge. In this way, vocabulary knowledge contributes to a one-two punch toward reading comprehension.

The study reveals that learners require extensive input in the form of reading to acquire a second or foreign language **(Krashen, 2004; Ponniah, 2008; Hsiek, Wang, & Lee, 2011).** Reading provides more input that affects acquisition, with a strong impact on grammar, vocabulary, spelling, writing style and reading fluency. Vocabulary acquisition is a key component of language acquisition. Precision in communication comes with the right choice of vocabulary. Vocabulary acquisition or learning remains a big challenge in the case of the L2 learners of English. Even in a country like India, where most of the population is constantly exposed to the language in some way or the other, learning the language and its vocabulary still has its challenges. The effort to understand the vocabulary acquisition process led to the

psycholinguistic theories of mental lexicon and lexical networks. According to these theories, words are stored and activated in the form of networks. Associations between the words are created by various features of a word which include the semantic relationship, phonographic and the orthographic relationship between the words.

The Natural Order Hypothesis states that a learner acquires a second language just as the way a child acquires its first language **(Krashen 1981).** If readers get sufficient comprehensible input through reading, they are sure to acquire all measures of language competence. Reading may be a compulsion for a school going child, pastime for a retired person, but a pleasure for many. You can discover simile on the face of novel- reader, a gleam in the eyes of the reader of a poem and furrow of seriousness on the forehead of a person reading a newspaper report. Reading disturbs mind and heart. Waves of thinking and emotion are generated by reading. So the pleasure is immediate and it continues to linger in the mind. Reading lifts us up from the harsh realities of life into the world of imagination. The magic touch of fancy transmutes grief into joy, failure into success, pain into pleasure and fear into hope. Even an unhappy man sheds his unhappiness and realities no longer press hard.

Reading gives intellectual satisfaction. A detective novel satisfies the sense of curiosity, serious literature encourages intellectual activity, light literature amuses us and poetry stirs our imaginations. One can relive the past and create the future by reading. By reading books, we enrich our experience and sharpens our judgments. Experience, in its turn, makes us wiser and self-confident. Books can give company when human beings cannot. We can happily spend our lonely hours in the company of the author-tailored characters.

A train journey may be tiresome if we do not have a magazine or a newspaper by our side sleepless nights may not be spent without a mystery thriller.

Reading gives us varied pleasure. A sensuous poet may provide a rich feast for our senses, another may satisfy our aesthetic sense. Reading gives spiritual, intellectual and even sensuous pleasure.

THE PLEASURE OF READING

Pleasure reading can be defined as reading that is freely chosen or that readers freely and enthusiastically continue after it is assigned. Our students (like all other human beings!) do what they find pleasurable. You get good at what you practice, and then outgrow yourself by deliberately developing new related interests and capacities.

In our study, we found that reading pleasure has many forms, and that each form provides distinct benefits:

Play pleasure/immersive pleasure is when a reader is lost in a book. This is prerequisite to experiencing all the other pleasures; it develops the capacity to engage and immerse oneself, visualize meanings, relate to characters, and participate in making meaning.

Intellectual pleasure is when a reader engages in figuring out what things mean and how texts have been constructed to convey meanings and effects. Benefits include developing deep understanding, pro activity, resilience, and grit.

Social pleasure is when the reader relates to authors, characters, other readers, and oneself by exploring and staking one's identity. This pleasure develops the capacity to experience the world from other perspectives; to learn from and appreciate others distant from us in time, space, and experience; and to relate to, reciprocate with, attend to, and help others different from ourselves.

Work pleasure is when the reader develops a tool for getting something functional done—this cultivates the

transfer of these strategies and insights to life.

Inner work pleasure is when the reader imaginatively rehearses for her life and considers what kind of person she wants to be and how she can connect to something greater or strive to become something more. When our study participants engaged in this pleasure, they expressed and developed a growth mindset and a sense of personal and social possibility. Taken together, these pleasures explain why pleasure reading promotes cognitive progress and social possibility, and even a kind of wisdom and wholeness, and, in a larger sense, the democratic project.

PROMOTING THE PLEASURES OF READING

We need to help less engaged readers experience these same pleasures. That is our study's major takeaway: We must make all five pleasures central to our teaching. We need to name them, actively model them, and then assist students to experience them. To promote play pleasure, use drama techniques like revolving role play, in-role writing, and hot seating of characters in order to reward all students for entering and living through story worlds and becoming or relating to characters in the way that highly engaged readers do.

To promote intellectual pleasure, frame units as inquiry, with essential questions. Read a book for the first time along with your students—figure it out along with them, modeling your fits and starts and problems through think-alouds and discussion. Or pair an assigned reading with self-selected reading from a list, or a free reading choice that pertains to the topic. Use student-generated questions for discussion and sharing.

To promote social pleasure, be a fellow reader with students. Put a sign on your door: "Dr. Wilhelm is reading _____." Read one of their favorite books. Foster peer discussion of reading and response in pairs, triads, small groups, literature circles, book clubs, etc. Do group projects with reading that are then shared and even archived. Have a free reading program and promote books through book talks, online reviews, etc.

To foster work pleasure, use inquiry contexts and work toward culminating projects, including service and social action projects. To foster inner work pleasure, engage students in imaginative rehearsals for living, inquiry geared toward current and future action, or inquiry for service. Have students think as authors making choices and plan scenarios for characters in dilemmas or those trying to help the characters. Write to the future or to a future self. Make no mistake, the next-generation standards worldwide require profound cognitive achievements. Meeting such standards and the demands of navigating modern life will require student effort and the honing of strategies over time. Promoting the power of pleasure reading is a proven path there.

CONCLUSION

Reading is a powerful tool that helps acquire all measures of language competence. Moreover, it is a pleasurable learning experience and reading will lower the anxiety level of learners in the learning environment. Traditional reading classes will help them acquire language skills, this will encourage them from learning a second language and, therefore, they should read more to acquire language. To include reading into the curriculum, potentials of reading should be tapped through future research and more research on how to organize reading

Programs are also required. So reading plays an important role in developing vocabulary, our curriculum should focus all these aspects of Reading to enhance the quality of learning.

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COVID -19 PREVENTION BY AYURVEDA AND YOGA

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Abstract

India has a great heritage of Ayurveda and Yoga. Both Ayurveda and Yoga is the origin of India. From our ancient times we depend upon Ayurveda as our medicine and yoga as our lifestyle. We are aware of the pandemic covid- 19 as it affects the world. All the roads are closed, cities are closed, and everybody has to sit in their house with the family. This is an extremely hard time for all of us.

Keywords: *Ayurveda, Covid 19, immunity, Pandemic,Yoga.*

It was in CHARAK SAMHITA and in it, there is a chapter called "Janapada DvamsaVyadhi" which means worldwide epidemics. In that book CHARAK says this is a great opportunity to stay at home.

What to follow:

We can start our daily routine life as follows. Start your day early in the morning, brush your teeth, scrape your tongue, rinse your mouth, and drink hot or worm water little bit turmeric or lemon juice added to it. Have ginger, cinnamon and cardamom tea, regular chai made with tulsi (one or two leaves), or even mint, cinnamon and cardamom tea. These herbal teas boost your immune and energy. As long as we keep our digestive system strong, then illness will not happen to us. There is a package of eight pranayama exercises: Bhastrika, Kapalbhati, AnulomVilom, Brahmri, Utjayi, Utgati and Sheetali and Sheetkari. By doing this pranayama, we can strengthen our immune system, lymphatic system and respiratory system. In this way we can boost our energy. It will help to develop and maintain the balance of immunity, strength, digestion and vital force of life. Charaka has mention simple herbal remedies, even thoughthere is no common cold, charaka says that you should take, sitopaladi, talisadi, abhrakbhasma and mahasudarsanachurna. Consume this preparation, ½ tea spoon three times a day or twice a day , every morning and evening. If you are tired,, you do not want to do that, you can make a chai and just put a pinch of sitopaladi or pinch of talisadi into the chai, it will give a good flavor to the tea. By doing pranayama we can clean our respiratory system so that we can keep away the virus.

In the same way is to do some yogasana like camel pose, cobra pose, cow pose, boat, bow and bridge pose,lotus and lion pose, we can improve our health supporting system. If it will too hard for you, just do surya namaskar. While doing

surya namaskar, do a minimum of 7 rounds and a maximum of 12 rounds. There are 12 important poses in surya namaskar. After surya namaskar do pranayama and the meditation. For meditation, sit quietly in lotus pose, sidhasana pose or sahajasan pose, and inhale with the sound "so"in your mind and exhale with the sound "hum". It will flower the inner joy, the inner beauty. After that sit quietly and feel your presence. It will feel you Sat Cheet Anand.Sat means truth, Chit means Awareness and Anand means joy. So, we have to see what is going on in this outer world. Everything that is going on, it will come and it will go in course of time, even this covid 19. We should enjoy the home-made food with our family members. Enjoy khichri (with moong dal and vegetables). Hot food is good, do not drink cold drinks. The cold foods will suppress your digestive system. Exposer to cold will diminish your natural resistance. You can have hot water. Take it through out the day or while eating.

Even at your home, you can do pooja, you can do aarti. During pooja clap with prarthana. It is a maram of heart, marma of lungs, marma of kidneys, and this clapping will strengthen your energy. It sends a massage to your internal organs of each body part. You can chant om, allahoakabar or any other spiritual language.

What weakens your immune system?

1. Poor diet, including too much sugar intake
2. Smoking
3. Excessive alcohol use
4. Inadequate sleep
5. Dehydration
6. No regular exercise
7. Stress
8. Obesity
9. Too many antibiotics

DURING COVID-19 CRISS, INCLUDEIN IN YOUR DIET

1. Greenly Leafy Vegs
2. Seeds and Nuts
3. Traditional Immunity Boosting Foods
4. Probiotics- Curd
5. Legumes & Whole grains

SPICES ANDCONDIMENTS FOR IMMUNITY

Holy basil, Turmeric, Pepper, Cinnamon, Ginger, Fennel, Cumin, Coriander are spices help to boost the immune system

With all above we need vitamin D and calcium to develop the immune system.

Sun light is the rich sources of vitamin D. Every day 15 minutes of exposer to sun in between 10a.m. to 11a.m. will help to get the vitamin D from natural sources.

CARE FOR ELDERLY PERSON DURING COVID-19

1. Wash your hands and face at regular intervals with soap and water
2. Ensure proper nutrition through home cooked fresh hot meals, hydrate frequently and take fresh juices to boost immunity
3. Take your daily prescribed medicine regularly (prescribed by doctor)
4. Do Exercise and Meditation
5. Postpone your elective surgeries (if any) like cataract surgery or total knee replacement
6. Clean the frequently touched surface with disinfectant regularly
7. Monitor your health, if you develop deep fever, cough and breathing difficulty, immediately contact nearest health care facility and follow the medical advice.

OBESITY AND COVID-19

Respiratory dysfunction

- Impaired respiratory mechanics
- Increased airway resistance
- Impaired gas exchange
- Low lung volume
- Low muscle strength

Comorbidities

- Cardiovascular diseases
- Diabetes mellitus
- Kidney diseases

Metabolic risk

- Hypertension
- Prediabetes
- Insulin resistance
- Dyslipidemia

For an obese person all the above risk will be high during this period.

VEGETABLE CARE DURING COVID-19

- First wash the vegetables using warm water
- Weep them steeped in warm water for 10-15 mins.
- If the vegetables are more soiled steep them in water containing 1 teaspoon baking soda for 10-15 mins.
- Rinse the vegetables using plain water, leave in air to dry, then store.
- Use kent vegetable purifier to virus free.

How to reduce your anxiety. During lockdown period anxiety is quite common to everyone

1. Share with your family very cordially
2. Basic well-being practice is highly essential
3. Think in prospective way
4. Balance between your work and life
5. Stay connected with your friend and family, use technology carefully
6. Instead of watching TV news every time read articles online
7. Show kindness and compassion

How to reduce stress

1. Give plenty of time for sleep/rest
2. Regular yogic exercise
3. Balance diet
4. Spiritual practice
5. Engage yourself with art, culture and entertainment

RECOMMENDED MEASURES:

1. Daily practice of, yoga, pranayama, and meditation for at least 30 minutes.
2. Drink warm water throughout day.
3. Spices like haldi(Turmeric), jeera(Cumin), dhaniya (Coriander) and lahsun(Garlic)are recommended in cooking.
4. Do not eat fried food frequently
5. Drink 3.5 to 4-liter water/day

Ayurvedic immunity promoting measures:

1. Take Chyavanprash 10mg (1tsf) in the morning, Diabetics should take sugar free Chyavanprash
2. Drink herbal tea, kadha, lomon juice and fruits
3. Golden milk- Half teaspoonhaldi powder in 150 ml of hot milk once or twice a day.

Simple Ayurvedic Procedure:

1. Oil pulling Therapy- Take 1-tab spoon sesame or coconut oil in mouth. Do not drink, Swish in the mouth for 2 to 3 minutes and spit it off followed by warm water rinse. This can be done once or twice a day.
2. Nasal application – Apply sesame oil / coconut oil or Ghee in both the nostrils [PratimarshNasya] in morning and evening.

During dry cough / sore throat:

1. Steam inhalation with fresh Pudina [Mint] leaves or Ajwain (Caraway seeds) can be practiced once in a day.
2. Lavang (Clove) powder mixed with natural sugar / honey can be taken 2-3 times a day in case of cough or throat irritation.